Thank you for your comment, glen hollander.

The comment tracking number that has been assigned to your comment is SEDDsupp20001.

Comment Date: October 30, 2011 18:36:02PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20001

First Name: glen
Middle Initial:
Last Name: hollander
Organization:
Address: [Withheld by requestor]
Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold address from public record
Attachment:

Comment Submitted:

I am interested in seeing how these projects developand do favor encouraging the use of solar and wind power. One thing I would like to see is encouragement of replacing incandescent bulbs with LED bulbs, the further development of high efficiency lighting, better insulation in existing buildings.
I believe there is enormous quantities of available rooftops available for development of solar panel arrays to compensate for current usage. These properties are already in use and adding solar arrays can be a simple addition. The electrical infrastructure is already in place to support this with grid tie inverters. An example is airport parking lots. Large parcels of pavement are dedicated to storage of automobiles while people are traveling. Roofs can be added with solar arrays on top to feed the electrical grid. At the least this neutralises electrical consumption of the airport. Another example is warehouses and large malls and manufacturing plants with largeroof areas. This is another example of unused resource for placement of solar arrays.
I realise this does not have as much flash and impact on public perception compared to a project setting aside copious parcels of land fencing it off to block public access and having large acres of solar panels arrayed row by row in some remote area of the country.

Thank you for your comment, Jeffrey Fontaine.

The comment tracking number that has been assigned to your comment is SEDDsupp20185.

Comment Date: January 28, 2012 01:17:57AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20185

First Name: Jeffrey
Middle Initial:
Last Name: Fontaine
Organization: Nevada Association of Counties
Address: 304 S.Minnesota St.
Address 2:
Address 3:
City: Carson City
State: NV
Zip: 89703
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

The Nevada Association of Counties believes that Nevada's counties should have been given an opportunity to provide input on the selection of solar zones within their jurisdictions before they were listed in the draft PEIS. Early consultation would have ensured that the solar zones were compatible with county resource plans and maps.

Significant weight should be given to the comments provided by Nevada's counties in this regard.

Thank you for your comment, Almut Fleck.

The comment tracking number that has been assigned to your comment is SEDDsupp20186.

Comment Date: January 28, 2012 01:32:05AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20186

First Name: Almut
Middle Initial: R
Last Name: Fleck
Organization:
Address: 7080 Sandale Rd
Address 2:
Address 3:
City: Twentynine Palms
State: CA
Zip: 92277
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Supplement Solar PEIS COMMENTS.doc

Comment Submitted:

Please extend the deadline for public comments. Don't put industry interests above the public good. We need more time to do solar right.
attachment below.
Thank you

Regarding the Supplement to the BLM Draft Programmatic Draft Environmental Impact Statement:

We must go solar, rooftop solar, directly distributed solar energy. As a country we have failed to plan for the future, many have denied the fact of global warming. Solar solutions have been around for decades but financially prohibitive for most, and so has global warming, dismissed as a conspiracy. Now there is an urgency and a rush to address the most serious challenge for survival. Global warming is finally real and the technological solution is fast-tracked –industrial sized solar zones and solar "fields."

While some significant changes have been made and are in the right direction, the Supplement Solar PEIS adds a huge number of "variance" lands for large-scale energy generation which is a choice not a federal mandate.

Public desert lands have been identified and sacrificed when we have empty space on homes, business, office buildings, and big government and corporate buildings. What we don't have is a long-term view of the effects on future generations. We want to save the planet and destroy ecosystems in the process. The philosophy of considering the consequences of our actions for 7 generations is no longer even contemplated, let alone applied in the Supplement solar PEIS.

"Our duty to the whole, including the unborn generations, bids us to restrain an unprincipled present-day minority from wasting the heritage of these unborn generations. The movement for the conservation of wildlife and the larger movement for the conservation of all our natural resources are essentially democratic in spirit, purpose, and method."—
Theodore Roosevelt

We are so focused on eliminating carbons, as if that were the only problem we are facing. How are the stakeholders going to comment on the Supplement Solar PEIS in a meaningful way when most people I spoke with don't know about the specifics of the plan, are not aware of the opportunity for public comment, or simply don't find the time to read the lengthy report? The size of the project, the complexity of the issues, the unanswered questions, the concerns about health and safety, the effects on the environment, wildlife, the socio economic changes on the local and regional tourism economies of the gateway communities to Joshua Tree National Park need to be addressed openly and with full public participation. An explanation should be provided why rooftop solar is not considered although a superior alternative. I urge you to extend the deadline for comments.

Sincerely,

Almut R. Fleck
Twentynine Palms, CA 92277
760.367.2722

Thank you for your comment, Arthur Haubenstock.

The comment tracking number that has been assigned to your comment is SEDDsupp20187.

Comment Date: January 28, 2012 01:50:54AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20187

First Name: Arthur
Middle Initial: L
Last Name: Haubenstock
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Address: 1999 Harrison Street
Address 2: Suite 2150
Address 3:
City: Oakland
State: CA
Zip: 94612
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: 2012-01-27 Comments on Solar SPEIS.brightsource.pdf

Comment Submitted:

Please see attachment for comments

BrightSource

January 27, 2012

VIA ELECTRONIC SUBMISSION

Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue, EVS/900
Argonne, IL 60439

Ms. Shannon Stewart
Bureau of Land Management
Washington Office
shannon_stewart@blm.gov

Ms. Jane Summerson
Department of Energy
Washington Office
jane.summerson@ee.doe.gov

Re: Comments of the BrightSource Energy, Inc. on the Supplement to the Draft PEIS for Solar Energy Development in Six Southwestern States

Dear Ms. Stewart and Ms. Summerson:

BrightSource Energy, Inc. ("BrightSource") is pleased to have this opportunity to submit these comments on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States ("SDPEIS"). BrightSource provides these comments as a supplement to those being submitted today by a group of conservation, utility and solar developer stakeholders, which includes BrightSource (the "Joint Conservation & Solar Comments"), and to those being submitted by the Large-scale Solar Association and the Solar Energy Industry Association on behalf of the solar industry (the "Solar Industry Comments"), which BrightSource equally endorses. BrightSource strongly supports the development of a programmatic approach to solar energy project review and approval on public lands, subject to the comments provided in the Joint Comments and the Solar Industry Comments, and those provided in this letter.

I. Introduction

Based on our extensive involvement in the federal solar program, we strongly commend the Office of the Secretary of the Department of Interior and the Bureau of Land Management ("BLM") for the significant investment in time and resources they have made to find effective, efficient, cost-effective and environmentally sound ways to achieve the promise of the world-class solar energy development potential of the nation's public lands. We also commend the Department of Energy for its pivotal role in fostering solar energy development at this critical stage of the nascent industry's development, and for its work in the Solar PEIS process as well.

BrightSource Energy, Inc.
1999 Harrison Street
Suite 2150
Oakland, CA 94612

www.BrightSourceEnergy.com

BrightSource will continue to be actively involved in the Department of Interior's efforts to meet the Secretary's goals, as set forth in Secretarial Order 3285A1 (amended Feb. 22, 2010), the California Governor's Executive Order S-14-08 (dated Nov. 17, 2008), and the Memorandum of Understanding Between the State of California and the Department of the Interior on Renewable Energy (as amended Jan. 13, 2012). We are also determined to help realize Department of Energy's renewable energy initiatives, such as the Secretary of Energy's SunShot Initiative to bring solar energy costs to a competitive level with conventional energy. Lastly, BrightSource fully intends to significantly contribute to fulfilling the President's new commitments of 10,000 gigawatts of renewable energy from public lands by 2012, as announced in the State of the Union address on January 24, 2012.

We believe that the Solar Program envisioned by the SDPEIS will be an essential part the success of all of the national and state policies noted above, providing that it is implemented consistently with the recommendations provided in the Joint Conservation & Solar Comments, the Solar Industry Comments, and the additional comments we provide in this letter.

II. Background on BrightSource & its Solar Power Tower Technology

BrightSource is a leading solar thermal technology company that designs, develops and sells proprietary systems that produce reliable, clean energy in utility-scale electric power plants. Our systems use proprietary solar power tower technology to deliver cost-competitive, renewable electricity with characteristics highly valued by utilities, such as reliability and consistency.

BrightSource is also the developer of the Ivanpah Solar Electric Generating System ("ISEGS") on solar energy rights-of-way ("ROWs") on public lands in the California Desert, which will be the largest concentrated solar project in the United States when it is completed, capable of supplying renewable resource energy to 140,000 residences. Since obtaining its ROWs in October 2010, ISEGS has been under continuous construction and is currently well underway, providing over 1000 jobs in one of the nation's areas of highest unemployment. We are pleased to provide a vibrant and successful example of solar energy development on public land, and wish to thank BLM and the Departments of Interior and Energy for the tremendous support that made this success possible.

BrightSource also has several other pending applications before BLM for solar energy ROWs. As a result, BrightSource would be greatly affected by the solar energy policies being created through the Solar Energy PEIS process.

BrightSource's Solar Power Tower Technology: Function & Energy Benefits

Our proprietary solar thermal technology is engineered to produce predictable, reliable and clean energy at a competitive cost. Our solution is specifically designed to address the challenges of utility-scale renewable power generation.

BrightSource

Our power tower solar thermal technology generates power the same way as traditional power plants – by creating high temperature steam to turn a turbine. However, instead of using fossil fuels or nuclear power to create the steam, BrightSource uses the sun's energy. This high-temperature steam can be used in the production of electricity, integrated with steam from fossil fuels as a hybrid system or from thermal storage, and can also be used for solar-to-steam applications such as thermal Enhanced Oil Recovery ("EOR").

BrightSource's technology harvests solar energy through mirrors that track the sun's movements through the day, which are called "heliostats." The heliostats are strategically arranged around a central tower, and focus the sun's energy on the top of the tower. In the current system design, a 130 MW plant will utilize up to 60,000 heliostats. Each heliostat is precisely placed in the solar field using our proprietary optimization algorithms to maximize the plant's power generation, considering how sunlight will fall on the project site throughout the day and each season of the year. At the top of the central tower is a "solar receiver," which is a utility-scale boiler, designed to be heated from the outside using concentrated solar energy reflected onto the boiler by the heliostats. From the solar receiver, high-temperature, high-pressure steam is then piped to a conventional steam turbine generator, which in turn produces electricity. The electricity is delivered to utility customers through a connection to the transmission grid.

Electric power plants using our systems produce more predictable power output than that of highly intermittent renewable sources such as wind and photovoltaic ("PV") systems. As our technology converts solar energy into steam, rather than directly into electricity, the system temperature remains high enough to continue to generate electricity through short periods of intermittent cloud cover. Electric power plants using our systems are therefore less likely to experience sudden and unexpected power output fluctuations. In addition, we expect that electric power plants using our systems will be able to bridge prolonged reductions in solar power output by discharging energy from a thermal energy storage system or through combustion of small amounts of natural gas, referred to as hybridization. With electric power plants using our systems, utilities and grid operators will require less backup generation to maintain grid reliability than competing wind and PV energy sources.

BrightSource recently announced another innovation in our design for future projects, incorporating thermal energy storage in the form of molten salts to the solar power tower configuration — a combination we refer to as SolarPLUS™. The benefits of our SolarPLUS™ systems include:

- Increasing annual energy output from each plant by increasing the plant's capacity factor – the number of hours that a plant produces energy—and thus avoiding the construction of other generation plants to produce that energy

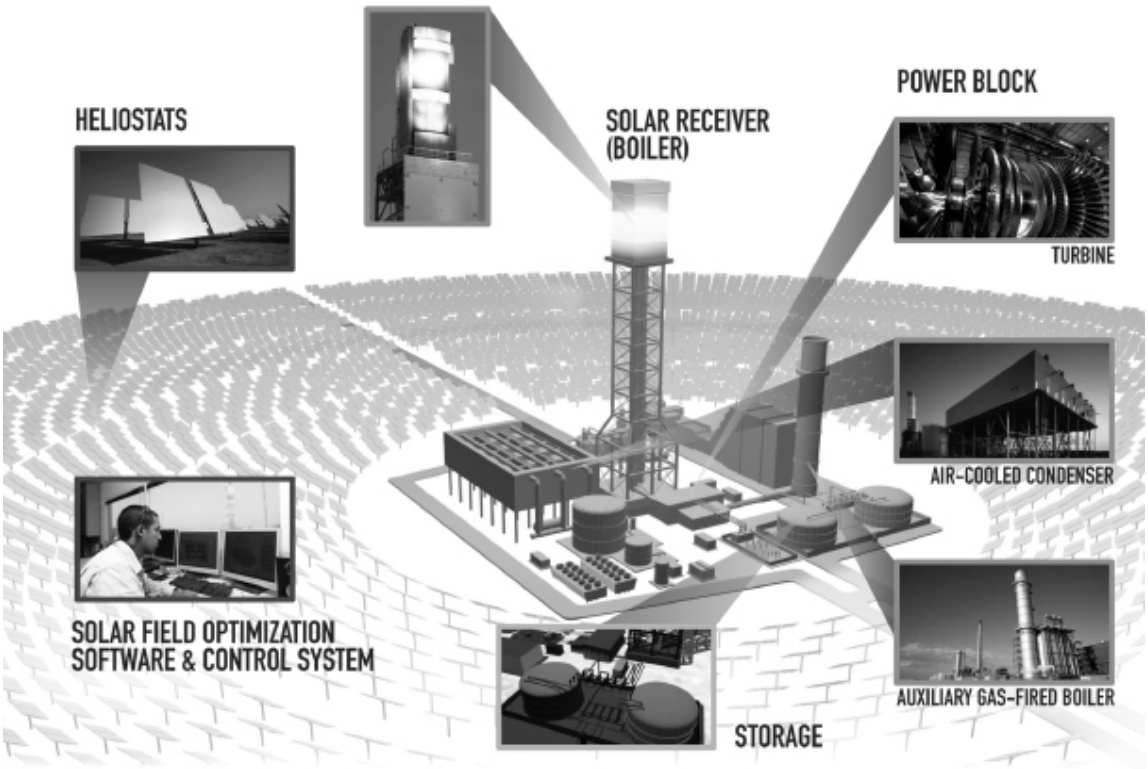
- Shifting electricity production to periods of highest demand, which is particularly important as the highest demand on the system moves later in the day (due in part to increased deployment of distributed solar power, which stops producing power when night falls)

- Avoiding the variability and integration issues that other intermittent renewable resources create for utilities and grid operators, thus reducing need for additional fossil fuel units for reliability "backup," which increase the overall emissions and costs of the energy system

- Supporting a reliable energy supply by providing "ancillary services" that are needed for grid stability

Our basic system design allows for integration with natural gas or other fuels, referred to as hybridization, which allows the plant's turbine to be driven by steam produced by solar heat, combustion, or both. Hybridization enables increased output and more reliable production of electricity, much like our SolarPLUS™ systems. Hybrid plants could be operationally very similar to conventional, dispatchable power plants, reducing emissions by using solar steam during hours when the sun is shining, while allowing continued power production at all other times—and making the most efficient use of the generation equipment. Hybrid plants would also allow use of efficient use of lands with much lower direct normal insolation ("DNI") than those powered by solar steam alone.

The diagram below shows the key components of a solar power tower plant that includes both solar thermal storage and an auxiliary natural gas-fired boiler.



BrightSource's Solar Power Tower Technology: Environmental Benefits

BrightSource's plants are more land-efficient than competing solar technologies. Our second generation plants at Hidden Hills and Rio Mesa further reduce our technology's footprint, by deploying an increased tower height that allows greater density of heliostat placement and a significantly smaller solar field. Compared to other utility-scale solar plants of similar capacity, such as PV farms or parabolic trough solar thermal plants, this advanced solar power tower configuration reduces land use by 33% or more.

Our projects utilize a low-impact design, leaving most natural contours and desert vegetation in place and preserving water flow patterns. As each heliostat is inserted directly into the ground on a pylon, with no concrete pads, our project sites can make efficient use of land with slopes of up to 10% or highly variable land surfaces, with minimal or no grading and very little soil disturbance. The individual placement of heliostats and our advanced algorithms for site optimization also allow our technology to avoid sensitive areas.

Our technology uses dry-cooling and closed-loop recycling, despite the additional cost, to reduce water usage to less than 10% of the water used by solar thermal plants with wet-cooling systems. This water-saving process is an important design element of our systems, since our projects are likely to be located in arid or desert locations

III. BrightSource Supports the Joint Conservation & Solar Comments and the Solar Industry Comments.

BrightSource, as a signatory to the Joint Conservation & Solar Comments, fully supports its recommendations to the Departments of Interior and Energy and to the BLM for the final Solar Programmatic Environmental Impact Statement ("Final PEIS") and Record of Decision ("ROD"). As a member of LSA and SEIA, BrightSource also fully supports the Solar Industry Comments. We are confident that if the Departments of Interior and Energy and the BLM follow the recommendations in those comments and those that we offer in this letter, the nation's Solar Energy Program will succeed in achieving its objectives and the nation's policy goals, including providing the nation with clean, sustainable energy to power a resurgent economy and greatly needed jobs, enhancing the permitting of solar energy projects, identifying environmentally-responsible places for developing solar energy projects, and ensuring the competitiveness of the nation's solar energy industry in the world market.

IV. BrightSource's Additional Comments on the SDPEIS

Brightsource offers the following recommendations in addition to those provided in the Joint Conservation & Solar Comments and the Solar Industry Comments.

BLM Should Revise the List of Pending Applications in Appendix A.

The SDPEIS states that pending applications will be subject to "continued processing under existing policies."[1] Pending applications are listed in Appendix A of the SDPEIS, but the Appendix does not include all the pending BrightSource applications. Bright Source requests that BLM add the following pending applications to Appendix A: [2]

- CACA-049421, Siberia, filed under Solar Partners V, LLC. Received by BLM 4-27-07. 13,920 acres.
- CACA-051967, Palo Verde II, aka Sonoran West, filed under BrightSource Energy. Received by BLM 5-12-09. 12,269 acres.
- NVN-090476, Pahrump Valley, aka Sandy Valley, filed under BrightSource Energy. Received by BLM 1-21-11. 15,190 acres.

[1] SDPEIS page 1-9 (Table 1.7-1).

[2] We note that, while these applications are not included on the Appendix A list provided in the SDPEIS, readers of the SDPEIS could find reference to the applications located in California during the comment period in the following way:

The Executive Summary of the SDPEIS directs readers to the Solar PEIS website:

> The BLM and DOE invite the public to comment on this Draft PEIS. The entire document is available on the project Web site (http://solareis.anl.gov) along with information on how to participate in the process, including how to provide comments and announcements regarding public meetings.

This website includes a page of links, which point viewers to additional information. By starting at the Solar EIS Links webpage, one can link to the California Desert District webpage and thus to a list that includes the five projects:

1. Begin at http://solareis.anl.gov/guide/links/index.cfm.
2. Click on the "BLM Solar Energy page"
3. Click on "Our Offices/Centers" along the left side of the page
4. Click on "California"
5. Click on "Field Offices" along the left side of the page
6. Click on "California Desert."

This will take the reader to http://www.blm.gov/ca/st/en/fo/cdd.html, which lists the projects in California mentioned above. Rather than requiring such a round-about reference to these applications, BrightSource requests their inclusion in Appendix A in the Final PEIS.

- CACA-053138, Rio Mesa Solar, filed under BrightSource Energy. Received by BLM 2-14-11. 3,054 acres.

- NVN-[# TBD], Sandy Valley III, filed under Sandy Valley Solar III, LLC. Received by BLM 10-21-11. 10,804 acres.

The Joint Conservation & Solar Comments, as well as the Solar Industry Comments, support treatment of these applications as Pending Applications.

In addition, BrightSource notes that two applications listed in Appendix A of the SDPEIS contain errors:

- NVN 083914 BRIGHT SOURCE ENGY SOLAR PTNR (Morman Mesa) July 25, 2007. Listed as 500 MW and 10,000 acres; it should read 1,200 MW and 24,000 acres.

- NVN 084631 BRIGHT SOURCE ENGY SOLAR PTNR January 28 , 2008. Listed as 1,200 MW and 2,000 acres; it should read 1,200 MW and 24,000 acres (originally identified as 45,000 acres).

BrightSource has communicated with BLM regarding the five applications identified above as having been omitted from the Pending Applications list in Appendix A, as well as regarding the two applications identified above as being included in the list with errors. BrightSource understands that these omissions and errors are expected to be corrected in an appendix to the Final PEIS.

Technical Criteria, such as Slope and Insolation, Should Not Establish Exclusion Areas.

The SDPEIS defines ROW exclusion areas as "areas which are not available for location of ROWs under any conditions." BrightSource believes the criteria used to identify exclusion areas should be limited to those elements that are clearly essential to preserving environmental values. Several of the exclusion criteria incorporate technical standards; this is inappropriate and unjustified, as these proposed limitations do not recognize current technological capabilities, nor the rapid innovation that is occurring in the solar energy industry. BrightSource supports the call by the Joint Conservation & Solar Comments for meaningful and significant pilot programs to explore development of lands with slopes between 5% and 10%, and of lands with lower insolation.

For example, BLM's proposed exclusion criteria of a 5% slope limit and minimum insolation requirement of 6.5 kWh/m2/day are based on the presumed capabilities of developers' technologies. These limitations are not valid. Technology is already being deployed by solar developers to make use of higher slope and lower insolation lands. As discussed above, BrightSource's current and future technologies are among those that are capable of making effective use of such lands, where it is environmentally appropriate to do so.

Exclusion of these higher slope and lower insolation lands may in fact induce sprawl, rather than reduce it, as areas near existing development and infrastructure would be placed off limits as a result of these arbitrary and outdated limitations, forcing development elsewhere. Exclusion of these lands can also be expected to increase development pressure on lands that are less desirable for development than some lands with higher slope and/or lower insolation. These results would be inconsistent with the intent of the Solar Energy Program, and could threaten its ultimate success and longevity.

Revising these technical limitations, such as through pilot programs, could be accomplished in the final SPEIS without requiring recirculation of another draft supplement. An agency is required to prepare a supplemental draft or final Environmental Impact Statement when "[t]he agency makes substantial changes in the proposed action that are relevant to environmental concerns. . . ."[3] Neither modification of the exclusion criteria from a 5% slope to a 10% slope, nor a reduction of the minimum insolation requirement of 6.5 kWh/m2/day, would constitute a "substantial change."

One factor in considering whether an agency has made a "substantial change" is whether the change is covered within the scope of alternatives already analyzed.[4] Here, the SDPEIS has already considered, within the existing range of alternatives, the programmatic environmental impacts of processing applications for lands without slope and insolation limitations. Under the no action alternative, projects can be developed under existing policies and law regardless of slope or insolation. The second and third alternatives that are considered further hold out the possibility of development on these lands by establishing a protocol for the creation of new SEZs that remains flexible in applying these criteria. Moreover, reducing or eliminating slope and insolation limitations would not result in more SEZs under these alternatives, but would only increase the amount of land available in variance areas. The impacts of solar energy development on lands within variance areas would be fully analyzed on a case by case basis. This is exactly what would occur under existing law.

Another factor regarding recirculation is whether the public has had a meaningful opportunity to comment on the issue. The public was put on notice that BLM is considering slope and insolation exclusions and that the exclusion criteria may be too restrictive to allow sufficient land for solar energy development.[5] Moreover, BLM chose the limitations based upon an assumption that such a standard would be "best suited with respect to technology limitations."[6] It is entirely foreseeable that the limitations might change as a result of public comments, including those from the solar energy industry on the correctness of BLM's assumption about technological limits, and the SPEIS itself notes that solar technologies can be expected to make effective use of lands with

[3] 40 C.F.R. § 1502.9(c)(1)(i)–(ii).

[4] Half Moon Bay Fishermans' Marketing Ass'n v. Carlucci, 857 F.2d 505, 508-509 (9th Cir. 1988).

[5] *See, e.g.*, SDPEIS, page 2-69.

[6] *Id.* at page 2-65.

greater slope and lower isolation.[7] BLM provided the public with sufficient information to permit "meaningful consideration" of an action under agency review.[8]

Height & Technology Limitations in SEZs Should be Dropped and Should be Determined on a Case by Case Basis.

The proposed height limitation of 10 feet for certain areas is excessive and unnecessary, as is any technology-based limitation. The presumption that taller technologies will necessarily have greater impacts on visual resources has no basis in fact, and is entirely location- and viewpoint-specific. BrightSource echoes the Joint Conservation & Solar Comments and the Solar Industry Comments in requesting that the height and technology limits in VRM Class II or III "consistent" mitigation[9] should be eliminated within SEZs, with aesthetic, cultural and environmental considerations applied only on a case-by-case basis in the project-specific NEPA process to mitigate actual visual impacts created by project height.

As a matter of principle and to ensure appropriately justified conclusions in the Final PEIS, BrightSource objects strenuously to any limitations based on technology types, rather than on the impacts of specific projects. Within classes of technologies, and depending on location-specific characteristics, any impacts of significance to the Solar Energy Program objectives can vary widely, including impacts on flora and fauna, water use and stormwater flow, land use efficiency, interference with aircraft or defense operations, and visual impacts. Limitations or mitigation measures, such as the Draft Solar PEIS mitigation recommendations for the De Tilla Gulch, Fourmile East, and Gillespie proposed Solar Energy Zones to prohibit solar power towers,[10] would unduly discriminate on the basis of technology rather than on actual impacts and have no proper place in the Final Solar PEIS.

Review of Pending Applications and Designation of Additional Solar Energy Zones.

The SDPEIS' proposed consideration of pending applications under existing rules and policies, rather than under those rules and policies that are adopted in the Final PEIS and ROD, is fully appropriate to ensure the regulatory stability needed for a new industry important to achieving the nation's policy objectives.[11] At the same time, many of the pending applications are not likely to ultimately result in viable projects that will serve the goals of the BLM and the Departments of

[7] SDPEIS, Appendix D, page D-3.

[8] *See Half Moon Bay Fishermans' Marketing Ass'n*, 857 F.2d at 508-09.

[9] SDPEIS pages C-58 and C-343, Section C.7.3 and Draft Table A.2.2.

[10] *See* SDPEIS, Appendix C, page C-343.

[11] Please note the Solar Industry Comments with respect to statements in the SDPEIS that are inconsistent with this treatment and suggest application of exclusion criteria to pending applications, which should be corrected in the Final PEIS.

Interior and Energy. The BLM should apply existing Instruction Memoranda to these pending applications, to ensure that it focuses its resources on those projects most likely to succeed, and to ensure that the land it exercises stewardship over is used appropriately and not held under application unnecessarily.

BrightSource also firmly believes that the ultimate success of the Solar Energy Program envisioned by the SDPEIS is dependent on the designation of sufficient Solar Energy Zones to support solar energy development, with access to transmission that will be available in time to serve the expected solar generation. It is incumbent on the BLM, and on all stakeholders, including the relevant transmission planning entities, to work together to identify additional, viable Solar Energy Zones promptly, and for decisions to be made on designating the first of these additional zones in 2013. Although variances will remain appropriate for areas too small to be considered for zones but desirable for environmentally-responsible development, the need for variances will be significantly reduced once sufficient zones have been established and shown to be successful.

V. Conclusion

BrightSource again appreciates the opportunity to provide these comments on the SDPEIS. We look forward to continuing to work with BLM and with all other stakeholders to advance environmentally-responsible solar energy development on public lands, and to achieving the renewable energy goals of the BLM, the Departments of Interior and Energy, and of the nation.

Sincerely,

Arthur L. Haubenstock
Vice President, Regulatory Affairs

Thank you for your comment, Christine Canaly.

The comment tracking number that has been assigned to your comment is SEDDsupp20188.

Comment Date: January 28, 2012 01:52:32AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20188

First Name: Christine
Middle Initial:
Last Name: Canaly
Organization: San Luis Vallley Ecosystem Council
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Address 2:
Address 3:
City: Alamosa
State: CO
Zip: 81101
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: 1.27.12.Comment.SupplementtoDraft.PEIS.CO.SolarStudyAreas.pdf

Comment Submitted:

My comments and support material are attached.

Friday, January 27, 2012
Delivered via electronic comment mail and hard copy U.S. post

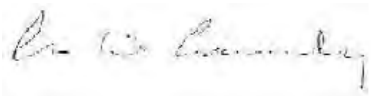
Supplement to the Draft Solar Energy Programmatic EIS
Argonne National Laboratory
9700 S. Cass Avenue – EVS/240
Argonne, IL 60439
http://solareis.anl.gov

Re: Comments to the Supplement of the Draft Solar Energy Programmatic Environmental Impact Statement, (DPEIS) specifically, 4 study areas selected for Colorado in the San Luis Valley

San Luis Valley Ecosystem Council (SLVEC) The mission of SLVEC is to protect and restore—through research, education, and advocacy—the biological diversity, ecosystems, and natural resources of the Upper Rio Grande bioregion, balancing ecological values and human needs. SLVEC works as the only local public lands advocacy organization that is concerned about protecting and restoring intact ecosystems and wildlife corridors, from the mountain peaks to the rivers along the valley floor, and into New Mexico.

Thank you for considering these supplemental draft comments and for your commitment to prioritize and bring the possibility of responsible renewable energy development to our nation's infrastructure. We look forward to a continual interchange of ideas and information throughout this process.

Sincerely,



Christine Canaly, Director, San Luis Valley Ecosystem Council www.slvec.org

There are 4 study areas within the San Luis Valley, representing all of Colorado totaling 16,308 acres.

1. DeTilla Gulch- North of Town of Saguache, between Hwy 285 and Hwy 17 in Saguache County (1,522 acres)

2. Four mile East-NW corner of Hwy 150 and 160 intersection, in Alamosa County (3,882 acres)

3. Los Mogotes East- West of Town of Romeo & Hwy 285 in Conejos County (5,918 acres)

4. Antonito Southeast- East of San Antonio Mountain in Conejos County (9,712 acres).

We appreciate the additional supplemental effort that provided further NEPA analysis; however, we also continue to see concerns that we would like to reiterate at this time.

- We want to support a Solar Program but have serious concerns regarding the proposed scale and implementation here as it relates to our existing transmission/grid infrastructure.
- We are concerned about the presumption of large-utility scale solar energy development which we see as a poor fit on public lands
- Please review our attached SLVEC position paper.
- Local jobs and revenue need to be properly phased and allow adaptive management over the 10-20 year planning window.
- Include a solar-energy-driven ecosystem conservation plan that offers a holistic guide to solar development including mitigation strategies and priorities.

Table of Contents

16) Public Health **-Page 18**

1) Adverse/Cumulative Impacts C.3.1.1

The San Luis Valley Ecosystem Council (SLVEC) appreciates the effort put into developing adverse impacts in the supplemental draft PEIS. This has been very helpful in providing reasonable guidance in determining what the future landscape might look like if utility scale projects are approved on public lands.

Additional Cumulative Impacts Assessment still needed

C.3.1.5.16 Cumulative Impact Considerations -None.

– SLVEC believes that a thorough cumulative analysis of SEZ development in the San Luis Valley would reveal that large-utility scale solar power development, with –big footprints" modeled after traditional centralized utility models based upon fossil fuels, would have enormous cumulative impacts upon the San Luis Valley. A thorough cumulative impact assessment should lead to reasonable mitigations to protect our communities and the environment while paving the way for future streamlined solar efforts. Indeed, the San Luis Valley is ready for more solar development, but we are cautious and want solar done for community enhancement.

> **Recommendation 1-1:** The Supplemental DPEIS should recognize the unique Colorado situation of having all four proposed SEZs, in addition to significant –Zones Plus" lands, located in the Upper Rio Grande watershed. This situation focuses and amplifies likely cumulative impacts of the Solar Development Program upon all other actions and resources in the valley, and calls for a more thorough analysis, especially since two of the four SEZ's are located within 3 miles of an existing transmission line.
>
> **Recommendation 1-2:** The Supplemental DPEIS should recognize the likelihood of our community generating significant solar power on private and municipal lands, with SLVEC stated goals of maximum of 650mW to export over 10-20 years as well finding solutions to the redundancy and reliability issue which is of ongoing concern to communities within the SLV.
>
> **Recommendation 1-3:** The Supplemental DPEIS cumulative impact assessment should guide a solar-energy-driven ecosystem conservation plan for the San Luis Valley. Such a conservation plan that would including ecological and agricultural planning and set the stage for future site-specific NEPA analysis, and outline general mitigation strategies based upon recent guidance (CEQ Guidance on Mitigation and Monitoring dated 16Jan11). BLM+DOE would find many willing partners on this effort and the SLVEC would be pleased to facilitate.

2) 1.3 Solar Program Supplemental DPEIS Purpose and Need

The objectives of BLM's proposed Solar Energy Program remain unchanged and include the following:
• Facilitating near-term utility-scale solar energy development on public lands;
• Minimizing potential negative environmental, social, and economic impacts;
• Providing flexibility to consider a variety of solar energy projects (location, facility size, technology, and so forth);
• Optimizing existing transmission infrastructure and corridors; and
• Standardizing and streamlining the authorization process for utility-scale solar energy development on BLM-administered lands.

We continue to state that more small-utility scale solar development would be embraced in the San Luis Valley on both on Federal and non-Federal lands, but only with smaller footprint projects, installed step-by-step under a coordinated adaptive management scenario with community DG and other solar efforts. Multiplied many times over, such a cautious, phased small-utility scale effort could achieve great power goals while reducing cumulative environmental impacts.

SLVEC still maintains the following concerns:

- Large-utility scale concentrated (big footprint) energy development will fundamentally change the energy future of the San Luis Valley, not necessarily for the good.
- Government-sponsored big-footprint energy development gives an unfair competitive advantage to large utilities with imperialistic business models and guaranteed profit margins, and no reason to respect local ownership, community needs, or the San Luis Valley ecosystem.
- Large capital projects will dominate energy development in the San Luis Valley, hindering local free-market innovation and smaller scale DG projects on private and municipal lands while driving the need for additional large-scale transmission development.
- Large-footprint projects are poorly suited to the adaptive management approach promoted by the environmental community, leading to maximum environmental impacts with expensive and often ineffective, after-the-fact mitigations.
- Large capital projects will proceed on a fast track, leading to boom-bust business cycles, short-term migrant jobs, and minimal long-term benefits to our local community.
- Two of the four SEZ's that have been selected in the SLV (Antonito Southeast and Fourmile East) do not optimize existing transmission infrastructure and corridors. They are at least 2-3 miles away from the existing infrastructure.

These cumulative concerns and likely impacts are surely ripe for analysis, without which the DPEIS would fail to streamline future site-specific NEPA and proper tiering.

Recommendation 2-1: The Solar Supplemental DPEIS must make a reasonable estimate for amount of solar power that could be generated in the San Luis Valley, including BLM lands and non-BLM lands, and how much of this power could reasonably be exported to other markets.

Recommendation 2-2: The Solar Supplemental DPEIS must recognize and evaluate the cumulative impacts of a reasonable range of solar-energy development strategies including a more diverse, phased, small-footprint small-utility scale (100 acre = 10mW each) program that would better mesh with local community DG efforts while helping meet Colorado renewable energy goals.

Recommendation 2-3: The Solar Supplemental DPEIS baseline must recognize the likely scenario of significant power generation on non-BLM lands in the San Luis Valley, including private, state, and municipal lands. See SLVEC position paper.

Recommendation 2-4: The Solar Supplemental DPEIS should consider dropping the two SEZ's that are not near existing transmission infrastructure.

3) Alternatives

The Supplemental Solar DPEIS continues to present a limited set of alternatives:

- No Action = baseline conditions with 7,282,258 acres of BLM lands available for utility-scale solar power development on a case-by-case basis.
- A Modified Solar Energy Zone Program alternative which would focus utility-scale solar energy development on 16,308 acres, under new program administration and authorization policies and mitigating design criteria.
- A Modified Solar Development Program (SEZ) alternative (Zones Plus) which would focus utility-scale solar energy development on 111,059 acres of BLM lands available under the new program administration and authorization policies and mitigating design criteria. *Please note that map 2-46 in the supplemental appear to have no designation marked (Lands available for application)for the Solar Development Program in CO. (Blue Area).*

The SEZ alternative lands do not offer a reasonable array of alternatives for Colorado for the following reasons:

- The unacceptably broad definition of ~~"u~~tility-scale" solar projects which could include community friendly, light footprint, small-utility scale projects as well as heavy-footprint, large-utility projects with enormous direct, indirect, and cumulative impacts.

- The San Luis Valley's so-called transmission-limited status (REDI 2009) which argues for additional alternatives to evaluate Solar Program development with and without a new transmission corridor.

Connected Actions – The Supplemental DPEIS does present existing transmission corridors, so there is no way to determine how unlikely it would be for utility scale solar to develop within two of the four study areas since they are at least 2-3 miles away from the existing corridor. However, we do not see the larger transmission issues properly considered as connected actions into the action alternatives (CEQ 1508.25(a)(1). SLVEC believes the interrelationship of power generation and transmission is critical to the understanding programmatic impacts here and, indeed, should drive alternation alternatives. For instance, the assumption of large-utility scale solar development in the San Luis Valley drives the apparent need for additional transmission, a project that may not be available within the 10-20 year DPEIS planning window. This in turn suggests a more prudent action alternative for the SLV that builds upon existing transmission corridors. We feel that optimization of existing transmission and upgrade on existing lines is a more cost effective way to export electrical power from the San Luis Valley to market.

Recommendation 3-1: The Supplemental Solar DPEIS analysis should be expanded to include a reasonable array of renewable-energy development scenarios, from small-utility (100-acre = 10mW) up to large-utility (6,750 = 675 mW) scales. This should include a meaningful mix of connected actions tied to transmission capacities:

- 150 mW – estimated to be needed locally, with available transmission within the valley.
- 300 mW – energy needed locally + estimated to be exportable with available transmission over Poncha Pass.
- 650 mW – energy needed locally + estimated to be exportable with upgraded transmission over Poncha Pass
- More than 650mW which would presumably require additional transmission.

Recommendation 3-2: The Supplemental DPEIS should include an action alternative with light-footprint solar energy development that would meet realistic energy goals in the San Luis Valley:

- A diverse mix of small-utility scale solar projects on public lands coordinated with similar scale projects on private and municipal lands.
- Project phasing over 10-20 years that would promote sustainable growth while allowing more effective adaptive management. For discussion, we propose a cumulative development of 10-30 mW per year over 10-20 years to meet our solar potential.

- Lower density layouts that would reduce impacts while promoting watershed conservation and better wildlife use of post-development landscapes.
- Equitable revenue sharing with the local community has not been analyzed, and solar-related multipliers including local suppliers.
- We support lands within solar energy zones (SEZs) to be withdrawn from location and entry under the mining laws.

Recommendation 3-3: The Supplemental DPEIS alternatives must offer more detail on the DOE Solar Energy program including:

- 2.3.1.6 Standardize and Streamline the Authorization Process is confusing and unclear, more detail needs to be analyzed
- Description of what the DOE solar program might look like per the action alternatives.

4) Solar Project Authorization 2.2.2.2.1

We believe the ROW process is not appropriate for solar-energy development in the San Luis Valley in part because it undercuts revenue generation and we are unclear as to what the rulemaking process will be to promote competition. How will the BLM choose the best, most practicable projects with greatest public benefit? We understand that authorizations under leases promote better competition amongst project proponents and leads to greater Federal revenues.

Recommendation 4-1: The Supplemental Solar DPEIS must identify and evaluate the logistical and financial differences between operating the Six-State Solar Program under ROW versus Lease authorizations, and present their environmental impacts as well as socioeconomic benefits.

Recommendation 4-2: The Supplemental Solar DPEIS should identify and evaluate the regulatory hurdles necessary to change from the existing solar ROW authorization process to a competitive leasing approach, and begin to make that change as soon as possible to facilitate the next round of site-specific Solar NEPA in the San Luis Valley.

Recommendation 4-3: SEZ authorizations should be tied to a solar-energy conservation plan for the San Luis Valley.

2.3.1.5 Optimize Existing Transmission Infrastructure and Corridors

According to the following definition, the BLM did not consider these variables when choosing the SEZ‘s in the San Luis Valley. Two of the four SEZ‘s are located at least 3 miles away from the existing corridor and only one SEZ (Detilla Gultch) is capable of using the existing transmission lline.

–Further, the BLM_s proposed SEZ identification protocol (see Appendix D, Section D.2.5, of this Supplement) will consider proximity to existing infrastructure such as transmission lines and corridors. The BLM will catalog the existing and proposed transmission lines in relation to the

power generation from a proposed SEZ location. The BLM will also consult with state and regional transmission planning and coordination authorities, state energy offices, and transmission system operators to evaluate available capacity on the existing and proposed lines and whether transmission access issues might create barriers to development in a specific area. Although it is likely that most new utility-scale solar energy development will require new transmission capacity, projects that can be located near existing transmission lines would likely result in fewer environmental impacts associated with connecting to and upgrading the existing lines. Similarly, solar projects that utilize existing corridors would result in reduced environmental impacts, assuming the corridor designation process factored potential environmental and other siting concerns into the corridor alignment. The use of existing 1 transmission infrastructure and corridors could also reduce cost, time, and controversy."

Recommendation 5-1: Since two of the four SEZ's are not in proximity to existing lines (2-3 miles away) and transmission capacity is greatly limited within two of the three zone, we recommend a withdrawal of three of the four SEZ's, with the exception of DeTilla Gultch.

5) NEPA Documentation

Important differences between the SEZs are not taken under consideration such as:

- The proposed DeTilla Gulch is located within a transmission corridor with transmission lines nearby. It is located in the closed basin part of the San Luis Valley and on alluvial fan materials that would be relatively easy to engineer for access and facility development.
- The Antonito SE site is located away from transmission corridors and Los Mogotes East has limited transmission capacity. They are located in the lower part of the San Luis Valley in the Rio Grande Drainage on lava flows with sparse, shallow soils that would be more difficult to engineer for access and facility development.

Such comparisons would help the Supplemental DPEIS meet the goal of streamlining future site-specific NEPA analysis while helping proactive project proponents better understand opportunities to become part of the Solar Energy Program.

Recommendation 5-1: A NEPA summary document pertinent to Colorado should be prepared including:

- Project summary from 1.6 Status of Reasonable Foreseeable Development Scenario. This definition assumes that solar will be developed in each state for export purposes. This assumption may not be true, in fact, most states want to develop energy for themselves and may not have an interest in importing from other states. That trend is being ignored in this document.
- Summary of Colorado SEZs and Zones-Only Lands, unable to determine, especially since map (2-46) is not clearly marked.

- Mitigations outlined in DPEIS Appendix A.

6) Socioeconomics – Jobs and Environmental Justice

We support Conejos County Clean Water (CCCW) in responding to this issue. *C.3.4.5.15 Socioeconomics and Environmental Justice- None*. We disagree with this assertion. Local solar construction projects to date have resulted in a small number of temporary jobs and an even smaller number of jobs for long-term site maintenance and management. These experiences do not prove the jobs numbers typically presented by industry proponents. Even in jobs-hungry Conejos County where 74 % of the Colorado SEZ development would be located, locals are skeptical of industry jobs projections (for instance DPEIS Table 5.17-6) and concerned for the loss of traditional agriculture-related businesses. Again, we believe this is due at least in part to the presumed heavy-footprint large-utility scale of discussions and clear history of fossil-fuel business models throughout the six Southwestern States. SLVEC believes these concerns can be mitigated via the Solar PDEIS program with the analysis of a more reasonable array of solar development scenarios that better match local conditions for solar energy generation and transmission such as proposed in Part 3 above under ―Alternatives." In addition, we believe that phased, less centralized solar development would promote more multiplier effects including other solar-related industries such as a PV panel manufacturer or assembly facility here in the San Luis Valley.

> **Recommendation 6-1:** The Solar DPEIS should evaluate jobs-creation comparing the more reasonable array of build out models discussed above, including a phased, less centralized small-utility scale solar development program coordinated with DG and other small scale development.
>
> **Recommendation 6-2:** BLM should place conditions on solar project authorizations that promote cautious project phasing that would promote long-term, locally based jobs in the San Luis Valley. Phasing of 10-30MW per year over 10-20 years would promote more local jobs, and increased likelihood of local manufacture, while meeting renewable energy goals.
>
> **Recommendation 6-3:** The Solar DPEIS should recognize the implications of forcing large-utility scale projects upon disadvantaged communities in the San Luis Valley, including NEPA Environmental Justice Considerations.

7) Socioeconomics – Revenue and Environmental Justice

The small-utility scale Sun Edison project on private land in the San Luis Valley has proven to generate significant tax revenue for Alamosa County, and similar projects are now in planning and soon to be in construction phases with similar revenue expectations. However, solar projects on BLM lands, especially under ROW authorizations, are not expected to generate as much local revenue. In fact, the large-utility model is often seen as imperialistic, with outside utilities generating power to be exported out of the area with little benefit to the local community.

Worse, we have real concern that large capital projects on public lands may have an unfair competitive advantage over local DG and small-utility projects, sapping local resources and further reducing local revenues.

SLVEC believes that properly phased, decentralized, small-utility solar generation and transmission would better serve our local economy while still helping meet renewable energy needs. While projects on private land have shown to be more beneficial, we encourage projects on BLM lands be analyzed that might have benefits if planned and implemented in a sustainable way.

Recommendation 7-1: The Solar DPEIS should evaluate projected costs and benefits of solar development in the San Luis Valley, comparing revenue generation and distribution in large-utility and small-utility scale projects.

Recommendation 7-2: The Solar DPEIS should identify and evaluate barriers to more equitable distribution of solar revenues including:

- The ROW vs. Lease authorization processes discussed above.
- Competitive project proposals

Recommendation 7-3: BLM should put conditions on solar project authorizations that would guide cautious project phasing which would in turn promote long-term revenues, including multiplier jobs and industries in the San Luis Valley. Also, there doesn‘t seem to be a direct tax or PILT process in place for counties to benefit from solar development on public land.

Recommendation 7-4: The Solar DPEIS should recognize the implications of forcing large-utility scale projects upon disadvantaged communities in the San Luis Valley, including NEPA Environmental Justice Considerations for Conejos County.

8) Solar Program Facilities Siting

The Solar DPEIS describes a thorough screening process used by BLM to eliminate almost 80% of BLM lands (99M – 21.5M) from the Zones Plus alternative and more than 99% of BLM lands for the SEZ alternative DPEIS Page 2-1 to 2-2). We understand this process was carried out in collaboration with local BLM field offices and eliminates land with open water, wetlands and riparian areas, critical habitats including habitat for Threatened and Endangered Species, areas with cultural resources including sites eligible for listing on the National Register of Historic Places, and other areas of important conservation values (DPEIS Table 2.2-2 on Page 2-8). In addition, the screening process did evaluate the possibility of development solar facilities on brownfields including previously disturbed grounds such as mining sites, closed industrial facilities, and landfills. This corresponds with our scoping comments dated 15July08.

We are concerned, however, that this screening only applies to solar-energy generation facilities and not to supporting linear infrastructure such as roads, transmission lines, and natural gas or water pipelines (DPEIS Page 2-7).

> **Recommendation 8-1:** The Solar DPEIS should disclose any lands of important conservation value that is likely to be utilized in transmission, road, and pipeline corridors as part of SEZ development in the San Luis Valley.
>
> **Recommendation 8-2:** The Solar DPEIS should disclose the presence of brownfields in and adjacent to the SEZs.

9) Natural Resources – Soil/Vegetation/Reclamation

We have reviewed the four Colorado SEZs by aerial photo and field reconnaissance site checks and see that the Solar DPEIS screening process described in Part 2.2.2.2 has eliminated most of the BLM lands with high ecological value including lands listed in our SLVEC scoping letter dated 10Sept09. Conversely, the low ecological function of these SEZ lands would present greater challenges to site development and reclamation. Disturbed areas would be prone to erosion from wind, vehicle use, precipitation, and increased water along facility drip lines. Thin soils will be difficult to manage, vegetation sensitive to disturbance, and the dry settings will make reclamation difficult.

The scale and layout of solar projects would have large consequences upon natural resource management. Heavy-footprint, large-utility scale projects would be difficult to fit into the landscape while creating more intensive disturbances over shorter periods of time and larger volumes of storm water over longer periods. On the other hand, light-footprint, small-utility scale projects would be easier to fit into the landscape and be more suitable to adaptive management including phased reclamation where ~~l~~live" materials from one project phase can be used to help reclaim another.

The DPEIS is ripe for evaluation of a solar-energy-driven ecosystem conservation plan for the San Luis Valley, identifying larger scale habitat values to guide site-specific NEPA analysis of the four SEZs, and high-value mitigations not readily apparent to site specific projects.

> **Recommendation 9-1:** The DPEIS should include a conceptual solar-energy-driven ecosystem conservation plan for the San Luis Valley responding to likely solar-development impacts and offering guidance for future site-specific NEPA analysis. Conceptual conservation planning would include:
>
> - Watershed based planning building on numerous sources including our SLVEC Ecosystem Map dated March11. **We submit link as a BLM/DOE resource.**
> - **http://slvec.org/Projects/renewables**

- Broad-based mitigation strategies that would guide future efforts and be fully funded by solar-energy development.
- No net loss of habitat values over the conservation area through restored habitat linkages, securing and restoration of important habitats, and protection under conservation easement.
- A net improvement of agricultural values over the conservation area through restored wildlife-friendly agricultural infrastructure, coordinated rest-rotation practices, and land protection through conservation easement.
- The SLVEC ecosystem base map as a planning base to be combined with other resources.

Recommendation 9-2: Site development plans should prohibit typical over-lot grading and be closely tied to habitat conservation plans to assure minimal disturbance, staging and immediate re-use of live topsoil and plant materials, and timely reclamation.

Recommendation 9-4: Site reclamation plans should include consideration of revegetation needs under solar panels. Consideration should include elevated panels to allow wildlife usage, and grass/shrub species suited to shade and reduced precipitation.

Recommendation 9-3: Site designs should take advantage of habitat modifications from solar panel shading and concentration of water along drip lines. For instance, all drip lines should fall into vegetated swales that connect to existing drainages.

10) Natural Resources – Groundwater/Surface Water

The Solar DPEIS sorting process has generally eliminated areas with open water, wetlands, and riparian areas with shallow groundwater. In addition, we understand all site development plans will include site-specific detailed surveys to further clarify site resources and develop mitigation strategies. As discussed above, we see the dilemma of working in these dry areas where solar facilities would shade out and block rain and snow but also concentrate water along facility drip edges. In addition, all four Colorado SEZs have value as water-recharge areas which would be modified by site development.

Here again, the scale and layout of solar projects would have large consequences on natural resource management. Heavy-footprint, large-utility scale projects would be difficult to fit into the landscape while creating more intensive disturbances over shorter periods of time and larger volumes of stormwater over longer periods. Such changes in hydrology could lead to increased overland flow and erosion of now-dry drainages. On the other hand, light-footprint, small-utility scale projects would be easier to fit into the landscape and be more suitable to adaptive management including phased reclamation and better connectivity between solar site drainage and adjacent natural drainages.

We commend the DPEIS for proposing to place a condition on authorizations to prohibit high-water-use solar facilities, consistent with our comments dated 10Sept09. This will go a long way toward re-assuring local residents.

> **Recommendation 10-1:** DOE should further evaluate water-conservation practices in solar-energy technology and develop performance-based standards for authorizations in the Proposed Solar Program.
>
> **Recommendation 10-2:** Site development plans should be closely tied to the solar-energy-driven conservation plan for the San Luis Valley recommended above.
>
> **Recommendation 10-3:** Site developments plans should include grading to collect drip-line water and other stormwater into vegetated swales connecting with existing drainages. Minor modifications of existing drainages may be required to handle additional flows possible from sites.

11) Natural Resources – Wildlife Habitat

The Solar DPEIS screening process described in Part 2.2.2.2 has eliminated most of the BLM lands with high wildlife value including lands listed in our SLVEC scoping letter dated 10Sept09. In addition, we understand all site development plans will include detailed surveys to further clarify site resources and develop mitigation strategies.

Not readily apparent from outside, these areas do have value to migrating birds, small resident mammals and the birds of prey who rely upon them as food base, and pronghorn antelope. We also understand there is some concern for migrating waterfowl mistaking solar arrays for open water. Upon recognizing their mistake, such waterfowl might not have the energy to regain flight elevations and be stranded in the dry areas chosen for the SEZs.

Here again, the scale and layout of solar projects would have large consequences upon natural resource management. Heavy-footprint, large-utility scale projects would be difficult to fit into the landscape while creating more intensive disturbances of wildlife populations. On the other hand, light-footprint, small-utility scale projects would be easier on resident and migrating wildlife, allowing them to disperse into closer adjacent areas. Light-footprint projects could be woven around existing habitat corridors, maintaining connectivity, as well as being more suitable to adaptive management.

The DPEIS is ripe for evaluation of wildlife characteristics in a solar-energy-driven ecosystem conservation plan for the San Luis Valley, identifying larger scale habitat values to guide site-specific NEPA analysis of the four SEZs, and high-value mitigations not readily apparent to site-specific projects.

Recommendation 11-2: Site development plans should be closely tied to conservation planning including timing of disturbances and reclamation activities.

Recommendation 11-3: Site reclamation plans should include consideration of wildlife opportunities under solar panels. Consideration should include elevated panels to allow wildlife usage, and forage species suited to shade and modified precipitation.

Recommendation 11-4: Site development plans should take into account the possibility that high-flying waterfowl might mistake the solar facilities for open water areas.

12) Natural Heritage and Cultural Resources

The Solar DPEIS screening process described in Part 2.2.2.2 has eliminated most of the BLM lands with Natural Heritage and Cultural Resource values including lands listed in our SLVEC scoping letter dated 10Sept09. In addition, we understand all site development plans will include detailed surveys to further clarify site resources and develop mitigation strategies. Here again, the scale and layout of solar projects would have large consequences on natural resource management. We believe light-footprint, small-utility scale projects would be easier to blend into the landscape, including avoidance of Natural Heritage and Cultural Resources. As mentioned in previous comments, three of the four recommended sites are located within the Sangre de Cristo National Heritage Area.

13) Air Quality

14) **C.3.3.5.10 Air Quality and Climate –** None. We disagree with this assertion
Air quality is a big concern in the San Luis Valley and every disturbance has the possibility of generating dust. This will be a particular concern in the SEZs due to the factors listed above such as sparse soils and difficulty of re-vegetation. There is also some concern for air pollution should a solar facility catch fire.

Here again, the scale and layout of solar projects would have large consequences on dust and air quality. Heavy-footprint, large-utility scale projects would be offer large continuous areas susceptible to wind erosion and fewer natural breaks and traps. On the other hand, light-footprint, small-utility scale projects would be easier to fit into the landscape, retaining and enhancing natural dust prevention and capture features, and be more suitable to adaptive management.

Recommendation 13-1: Solar site development plans should include conservation methods to prevent dust erosion and capture dust as part of site layout. Additional measures including dust-inhibitors should be balanced against re-vegetation needs. (Dust inhibitors also can inhibit vegetation growth)

Recommendation 13-2: The Solar DPEIS should evaluate the impacts of low-probability events at developed solar sites including fire and explosions related to natural disasters and terrorism.

15) Visual Resource Management

Thank you. We understand the authorization process would prohibit high-profile solar facilities such as ―power towers" and that all site plans would include visual resource evaluation. SLVEC supports these conditions. We appreciate the very thorough analysis.

16) Public Health

We did not find in the Supplemental DPEIS discussion of potential impacts upon public health from Electromagnetic Frequencies (EMF) including EMF emitted from transmission lines near homes, schools, businesses or places such as the Blanca/Ft. Garland Community Center This is another reason to include transmission lines and necessarily connected actions to solar energy development.

Recommendation 15-1: The Solar DPEIS should develop and present general characteristics of EMF effects along all existing and proposed transmission corridors.

Recommendation 15-2: The DPEIS should evaluate the health effects of EMF from different scales of solar development.

Recommendation 15-3: Project authorizations should include evaluation of EMF effects upon local populations of humans as well as wildlife.

cc:
Erin Minks, Senator Mark Udall
Charlotte Bobicki, Senator Mike Bennet
Brenda Felmlee, Rep. Scott Tipton
Jane Summerson, DOE
Andrea M. Jones, BLM La Jara
Jeanna M. Paluzzi, CSU Extension, GEO Office

Thank you for your comment, Michael Powelson.

The comment tracking number that has been assigned to your comment is SEDDsupp20189.

Comment Date: January 28, 2012 01:54:40AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20189

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Attachment: TNC comments on the BLM SDPEIS for Solar Energy.docx

Comment Submitted:

January 27, 2012

Mr. Bob Abbey
Director
Bureau of Land Management
Solar Energy PEIS
Argonne National Laboratory
9700 South Cass Avenue
Argonne, IL 60439

Dear Mr. Abbey:

Thank you for the opportunity to comment on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development (SDPEIS). The Nature Conservancy's response is attached.

If you have any questions, please contact Michael Powelson, Director of Energy Programs, North America Region, at (503) 233-4243 or mpowelson@tnc.org.

Sincerely,

Robert Bendick
Vice President for External Affairs

Enc. Comments on the BLM's Supplement to the Draft Solar PEIS

The Nature Conservancy
Protecting nature. Preserving life.™

Comments on the Bureau of Land Management Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development

The Nature Conservancy · 4245 North Fairfax Drive, Suite 100, Arlington, VA 22203 · (703) 841-5300

Introduction

The mission of The Nature Conservancy (the Conservancy) is to conserve the lands and waters on which all life depends. Our on-the-ground conservation work is carried out in all 50 states and in 30 countries with the support of approximately one million members. To date, we have helped conserve more than 117 million acres worldwide, with 24 million acres conserved in the United States alone. The Conservancy owns and manages approximately 1,400 preserves throughout the United States; they form the world's largest private system of nature sanctuaries. The Nature Conservancy has completed ecological assessments for all terrestrial and freshwater eco-regions in the United States, including extensive analysis juxtaposing these assessments against of our nations' renewable and other energy sources to inform energy siting and mitigation that best conserves our country's biodiversity resources.

The Conservancy previously provided in-depth comments and recommendations to the Draft Programmatic Environmental Impact Statement for Solar Energy Development (DPEIS) prepared by the Bureau of Land Management (BLM), based on our on-the-ground experience, our scientific expertise, and our engagement in public stakeholder planning processes, including BLM's Restoration Design Energy Project in Arizona, the State of California's Desert Renewable Energy Conservation Plan (DRECP) and the California Desert and Solar Working Group (CDSWG). We are encouraged by the direction taken in the Supplement to the Draft Solar PEIS and commend BLM for their efforts to prioritize policies and practices with the potential to significantly minimize harm to sensitive desert habitats, while allowing robust development of our nation's renewable energy resources on public lands.

Based on our familiarity with renewable energy issues, as well as our conservation planning and science expertise, we maintain that the goals of increased clean energy development and protecting biodiversity are not mutually exclusive, given the appropriate scientific and policy framework. We continue to support BLM's proposal to create a solar energy development program and the Department of Energy's (DOE's) proposal to identify policies that avoid and minimize ecological impacts and protect natural and cultural resources for solar projects involving the agency. In this response, we will highlight outstanding issues that should be redressed before the solar energy development program is finalized and the Solar PEIS Record of Decision (ROD) is reached.

The Nature Conservancy's Recommendations

General Overview

The Conservancy's general recommendations to BLM on the creation of a solar energy development program are unchanged and can be found in our previously filed comments titled "Response to the Bureau of Land Management Draft Programmatic Environmental Impact Statement for Solar Energy Development."

In the following pages, the Conservancy's recommendations focus on specific improvements that may yet be made to the Solar PEIS: the use of landscape-scale assessments to inform siting and mitigation decisions; the identification of new Solar Energy Zones (SEZ); how pending projects should be addressed; the adoption of Best Management Practices, especially for water resources; and mitigation, especially specific to elements and processes for the development of regional mitigation plans. We also include our ecological analysis of the revised zones included in the SDPEIS, and our thoughts on criteria and process for siting of new projects outside of SEZs, i.e. "variance."

A Program for Solar Energy Development

The Nature Conservancy recommends adoption of the Modified SEZ Alternative that limits solar development to SEZs, those currently identified in the SDPEIS (and revised per these comments) and any new SEZs BLM creates in the future, as the basis of a program to manage solar energy development on BLM-administered lands. However, we recommend several important revisions to structure a program that meets the needs of solar development while ensuring biodiversity conservation, irrespective of which action alternative is eventually selected.

First, we strongly recommend that BLM use landscape-scale ecological assessments and best available science as the basis for **all** siting and mitigation decisions, i.e. the basis for any solar energy development program.

Second, BLM should specifically use landscape-scale ecological assessments as the basis for the creation of new zones and the modification of existing zones. We also recommend that BLM use assessments for further analyzing and modifying the SEZs identified in the SDPEIS, per our analysis contained in our Appendix at the end of these comments. Additionally, should BLM create a variance process for projects sited outside of SEZs,

landscape-scale ecological assessments should be used to identify areas and places where siting of projects should not occur.

Third, we reiterate our recommendations that BLM include specific metrics, monitoring and accountability for specific Best Management Practices (BMPs) for the planning, construction and operation of solar energy projects to ensure undesirable and damaging environmental impacts are minimized. We strongly recommend clear, enforceable BMPs for the protection of water resources, especially key in the arid Southwest. Lastly, BLM must incorporate a robust mitigation framework that avoids and minimizes ecological impacts to the greatest extent possible, and includes a compensatory mitigation program that ensures, through clearly specified elements and compensation requirements, that all unavoidable ecological impacts are fully addressed.

SDPEIS Alternatives

The Supplement to the Draft Solar PEIS (SDPEIS) evaluates three alternatives: a No Action alternative; a Modified SEZ Alternative ("Modified SEZ Alternative"); and a Modified Solar Energy Development Program Alternative ("Modified Program Alternative"), selected by BLM as the preferred alternative.

The Nature Conservancy specifically recommends BLM select the Modified SEZ Alternative, which exposes fewer acres of high value conservation lands to habitat conversion or degradation while still providing ample initial room for solar energy development, and allowing additional SEZs to be created should they be warranted. In contrast to the Modified SEZ Alternative, both the Modified Program Alternative and the No Action alternative open far too many acres to potential solar energy development, putting the sensitive habitats and natural communities of the Southwest at risk, preclude other beneficial uses under BLM's multipurpose mandate, and inefficiently use our scare public resources by failing to focus them on those areas where solar energy development has the greatest likelihood of success. We urge BLM not to adopt either of these alternatives.

The Nature Conservancy strongly supports the Modified SEZ Alternative over the preferred alternative for a number of reasons:

1. Concentrating solar development in zones that are most appropriate for development will ensure that solar projects are built faster, cheaper and in a manner that is better for the environment, developers and consumers. The use of SEZs will allow BLM to focus scarce assessment, planning, permitting and monitoring resources to specific places, likely leading to robust and detailed understanding of development areas that hasten and streamline processing of project applications (including consultation under the Endangered Species Act, where applicable), project construction, and the implementation of any mitigation.

2. The SEZ approach greatly reduces uncertainty in transmission planning (especially if transmission is considered when creating new SEZs) and will allow federal and state agencies to analyze with reliable assumptions the need for any necessary transmission planning and/or construction, including upgrades that will be needed to bring renewable energy to population centers. This will facilitate and expedite transmission planning processes, and thus the ultimate delivery of renewable energy to consumers.

3. Conservation science supports this approach as SEZs are likely to overlap with significantly fewer acres of important conservation areas, and by focusing development away from intact habitats, reduce habitat fragmentation and preserves wildlife corridors. Analysis by The Nature Conservancy has found the modified SEZs reduce the area of high conservation value impacted by development by nearly 53% relative to the Modified Program Alternative (from 2,885,786 acres to 135,885acres) across California and Nevada. (Please see the Appendix for a description of the analysis that The Nature Conservancy conducted).

4. The modified SEZs identified by BLM in the SDPEIS, given the robust Reasonably Foreseeable Development Scenarios developed for the DPEIS and used in the SDPEIS, allows for plenty of room for solar energy production to grow responsibly over the next five years and will allow for robust expansion of solar energy in the future. Additionally, to ensure a robust program, we support a well-designed process for the creation of new SEZs, especially in those places that may not be well served by the zones in the SDPEIS, i.e. close to existing load.

5. The SEZ approach creates an atmosphere of success: our public lands are used and enjoyed by many stakeholders, and by focusing solar energy development to specific places where solar energy development is appropriate current concerns and tensions within the public will be greatly reduced. In this case, less truly is more - by focusing on areas where projects have the greatest chance for success, rather than investing time and resources "fixing" inappropriately sited projects, BLM can ensure that good projects move forward quickly, and our most critical areas of biodiversity are protected.

The Nature Conservancy opposes adoption of the preferred alternative, the Modified Program Alternative, for the following reasons:

1. The potential for conflict ecological, cultural and social conflict would be very high. For example, The Nature Conservancy's ecological assessments for the Mojave and Sonoran eco-region shows that millions of acres open for development in this alternative would directly impact important regional conservation areas, and jeopardize several ESA-listed and many other sensitive and vulnerable species. This has the potential to create a significant atmosphere opposed to solar energy development.

2. Making available millions of additional acres in addition to the SEZ's in the SDPEIS, in areas potentially inappropriate for solar development, without clear incentives to locate projects in SEZs, and clear disincentives for developing outside of zones, undermines the carefully chosen low conflict/high resource SEZs, and is likely to ultimately inhibit the development of the fledgling solar energy industry, leading to major setbacks to our desperately needed transition to a clean energy economy. Opening up vast areas for solar development will only perpetuate the atmosphere of concern and conflict we have witnessed over the last three years.

3. BLM estimates that approximately 300,000 acres will be needed to produce over 30,000 megawatts of electricity generated by solar power by 2030, under even the most robust and optimistic Reasonably Foreseeable Development Scenarios, we believe that automatically making more than 3.4 million acres immediately available for solar development is unnecessary, especially given a strong commitment to undertake a well-delineated, robust process

for adding new SEZs as warranted, and would constitute a significant misallocation of public resources.

It continues to be important to note that thorough ecological assessments for each SEZ identified in the SDPEIS will be needed, as none of the current SPDEIS analyses of alternatives provides sufficient information to meet NEPA sufficiency standards for siting of individual projects within SEZs. For example, the Conservancy's eco-regional analyses, previously offered in our public comments on the DPEIS, rank the ecological sensitivity of desert locations only on a broad scale, and, if used as a guide to create new SEZs (or site individual projects) would still require finer scale, site-specific data collection and analysis to permit solar development projects.

The Role and Use of Landscape-scale Ecological Assessments

The Nature Conservancy has developed and used science-based tools to achieve lasting conservation.[1] Landscape-scale ecological analysis is the operative heart of these tools. In our prior comments on the DPEIS, we stressed the vital importance of using landscape-scale ecological assessments in land-use planning and decision-making, and we believe that BLM should make a strong commitment to greater use of landscape-scale ecological assessments in energy siting and mitigation decision-making.

As previously mentioned, BLM has made significant progress on this front. In Appendix D under "Additional Locally Relevant Screening Criteria," for the creation of new SEZs, BLM states in D.3.3 that "BLM should use landscape-scale ecological assessments to identify, and exclude from SEZs, areas of high ecological value or importance (e.g., BLM's rapid ecological assessment, California's Desert Renewable Energy Conservation Plan [DRECP], The Nature Conservancy's eco-regional assessments, and Crucial Habitat Assessment Tools being developed pursuant to the Western Governors Wildlife Council "Wildlife Corridors Initiative"). For example, in areas with pre-existing landscape-scale conservation plans, such as the DRECP in California, future SEZs will not be considered in areas needed to achieve biological goals and objectives established in the plan. Other

[1] For example, *Conservation by Design*, is used to identify the most important places for conservation, threats to the ecological health of those places, the best strategies to reduce those threats, and how to measure our effectiveness, via an eco-regional assessment process.

types of areas to screen for based on landscape-scale information may include areas with significant populations of sensitive, rare, and special status species or unique plant communities, important biological connectivity areas for special status species, designated wildlife habitat management areas, and areas with high concentrations of ethno-botanical resources of importance for Native American use. To identify additional locally relevant screening criteria, the BLM will undertake consultation with appropriate land management agencies for consideration of areas close to special designations such as the National Parks, National Refuges, and National Forests. Such consultation may result in agreements not to locate SEZs near specific units, based on an agency's assessment of potential adverse impacts on those units. As its environmental analysis for individual solar ROW applications on public lands continues, the BLM is expanding its knowledge of areas not suitable for development. Areas eliminated from ROW applications due to resource conflicts (e.g., rare vegetation or desert washes) may provide additional screening criteria for SEZs."

We highly commend BLM for including this language. We also applaud the agency's current engagement in the California Desert Renewable Energy and Conservation Plan (DRECP), BLM's creation of the West Chocolate Mountains scoping and EIS process, the Arizona Restoration Design Energy Project, and EPA's Repower America effort.

However, the SPDEIS does not make use of eco-regional assessments and best available science as one of the **primary** bases for the creation of new SEZs or the specific siting of solar energy projects. This is a significant oversight, and thus we strongly recommend that BLM:

1. Use landscape-scale ecological assessments (LSEAS) as a key tool to identify and avoid solar development in areas of high ecological value. BLM should use these tools in the evaluation (and rejection) of existing applications, the creation and modification of SEZs, and, if adopted, in decisions on acceptable variance application areas.

   We recommend, further that "areas of high ecological importance" as described in Appendix D, D.3.3 be included as a specific "Program Exclusion Criteria" for the creation of new SEZs to ensure that SEZ creation avoids ecological and other land use conflicts in siting new solar energy projects.

2. The SDPEIS mentions the desire of BLM to identify and evaluate converted or highly degraded lands, on both BLM-administered and adjacent public and private lands, for use as SEZs. BLM should use LSEAs to identify these areas, and we recommend identified areas be offered as the preferred areas for solar energy development, creation of new SEZs, and if adopted, a key siting criteria within a project siting variance process.

3. BLM should use LSEAs to identify areas of high ecological value on both public and private lands to guide mitigation investments—for acquisitions of private land, or administrative, management or restoration actions on BLM-administered lands.

4. The DPEIS should specifically call for the incorporation of the results of BLM's REAs, the California Desert Renewable Energy and Conservation Plan, BLM's West Chocolate Mountains scoping and EIS process, BLM's Arizona Restoration Design Energy Project, and EPA's Repower America's, and any analyses captured by BLM's Assessment, Inventory and Management program into resource management plans. Specifically, BLM should be use these tools along with LSEAs to establish goals for protection of specific conservation targets, to identify lands and actions needed to meet those goals, and to assess the best places for mitigation investments.

A Least Conflict Approach to Adding New or Modifying Existing Solar Energy Zones

While we believe that the modified SEZs in the SDPEIS allows for significant development of solar energy, especially given stated goals of the Departments of Interior and Energy and state Renewable Portfolio Standards covered by the affected area, we recognize that additional SEZs may be needed to ensure robust opportunities for the development of solar energy. To ensure the protection of sensitive desert species and habitats, we recommend BLM improve the SDPEIS by adopting a least conflict selection method for adding new or modifying existing SEZs. In part, BLM can accomplish this by accommodating, supporting and expanding ongoing BLM, other federal and state processes that discriminate among those areas appropriate for conservation versus those approved for siting – we applaud and strongly support BLM's recommendation to rely on the results of the CA DRECP, the BLM West Chocolate Mountains EIS, and BLM's Restoration Design Energy Project in Arizona in the

identification and creation of new SEZs (Sections 2.2.2.5 and 2.2.2.6 of the SDPEIS).

Please see our comments in the section above, "The Role and Use of Landscape-scale Ecoregional Assessments" for additional recommendations on the elements of a "least conflict" approach to adding new of modifying existing SEZs.

Developer Incentives for Moving into SEZs

To ensure robust development in SEZs, the SDPEIS should establish specific incentives for developers to locate all new applications within SEZs, and to relocate existing applications (as delineated in the SDPEIS) from higher conflict areas to these zones. [2] Our recommendations are:

1. Provide speedier and easier permitting for applications within SEZs;

2. Improve and facilitate mitigation for applications in SEZs;

3. Expedite transmission planning, permitting and construction to SEZs;

4. Provide economic incentives for development within SEZs.

Faster and Easier Permitting in Zones

We recommend that agency NEPA resources and coordination teams be focused on permitting solar projects within SEZs, versus projects outside of SEZs. Once a SEZ is designated, a zone-level EIS coordinated with Section 7 consultations, should be conducted at a sufficiently fine scale to allow individual project tiering, ensuring rapid completion of remaining individual project NEPA analyses.

Schedules for individual project NEPA reviews should be established and backed by single-contact interagency teams focused on expediting SEZ NEPA completions, including the critical Section 7 review process.

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[2] See *Management of Pending (Existing) Applications*, infra, which includes a discussion of our recommendations on providing a reasonable transition for existing plant applications from outside to within SEZs.

Improve Mitigation Certainty for projects within SEZs

SEZ-level NEPA analyses should include the establishment of regional mitigation plans to cover the anticipated compensatory mitigation needs for reasonably anticipated cumulative development within the zone. A developer within the SEZ may then satisfy compensatory mitigation responsibilities for any unavoidable project ecological impacts through contributing to funding the implementation of the regional plan, rather than entering into potentially lengthy negotiations over land acquisition or other actions. This facilitated regional mitigation approach improves permit efficiencies and financial predictability for the developer. At the same time, it also focuses offsets on rationally-established conservation priorities, including sensitive species benefits through higher quality habitat, improved connectivity between habitat areas, and better long-term ecosystem protection.

Expedite transmission to SEZs

BLM can take a number of actions to facilitate transmission planning and development to service projects sited within SEZs, although we acknowledge some essential steps may lie outside of the agency's direct influence and control.

1. Each SEZ-level EIS should analyze gen-ties and larger lines, and consider the need to build additional roads to facilitate transmission development;

2. BLM should seek cooperative agreements to facilitate State permitting of gen-ties and longer lines, as well as to facilitate permitting of high-voltage interstate power lines that could support solar energy development in SEZs;

3. The SEZ EISs should provide a detailed evaluation of the transmission needs and impacts for anticipated solar development within the SEZ to assist in both the planning and permitting of transmission;

4. We strongly encourage the BLM to devote SEZ-targeted resources to participating in the key ongoing comprehensive transmission planning efforts and to seek agreements with state and regional authorities to ensure that SEZ areas get adequate attention.

Key planning efforts include, for California, the California Independent System Operator Transmission Planning Process and Statewide Transmission Plan, the California Transmission

Planning Group, and transmission planning conducted as part of the DRECP Process.
At a regional level they include efforts by the Western Electricity Coordinating Council (WECC), the Western Governors Association (WGA), and the Western Area Power Administration (WAPA).

More specifically, for California, we recommend that BLM request the CA ISO and the Public Utilities Commission to enter into a MOU with the Interior agencies (BLM and the USFWS) to coordinate planning and permitting for solar energy development in SEZs. This will ensure that SEZ-related transmission projects are included in the Revised Transmission Planning Process and enlist CA ISO and CPUC assistance in identifying and analyzing SEZ projects.

Outside California, the BLM should seek similar MOUs with relevant regulators and transmission planners in the other five states within the DPEIS study area to give priority consideration to necessary lines. Close coordination with transmission planning efforts will ensure that SEZ solar energy projects can rely on transmission in the planning stage and loads generated within SEZs or on other BLM-administered lands can be efficiently utilized upon facility start-up.

Provide Economic Incentives for Solar Development within SEZs

Beyond help in permitting, mitigation and transmission, the Conservancy recommends that BLM offer projects locating within SEZs economic incentives:

1. A reduced capacity charge on energy generated within a SEZ;

2. Provision of a longer phase-in period for rental payments.

Private Land Incentives

BLM should explore and encourage development of renewable energy on appropriate private lands near and adjoining BLM-managed lands that would place projects on lands that are not ecologically valuable. For projects proposed to be located in SEZs where use of adjoining private lands would provide additional project viability, BLM should explore whether it can offer all permitting incentives described above to the project as if it were fully on BLM land.

Best Management Practices

Broad Principles

The Conservancy's previous response to the DPEIS observed that while the DPEIS devoted significant attention to BMPs and BLM policies for the processing and approval of solar facilities on BLM-administered lands, it provided few specifics or metrics to ensure impacts would be minimized. Broadly applicable principles require specific administration, monitoring, and if necessary, enforcement provisions to effectively minimize impacts. The SDPEIS does not expand the discussion of the BMPs included in the DPEIS, e.g. how broadly stated principles will be applied, nor address gaps or missing elements. The existing discussion of BMPs is insufficient to provide clear and firm guidance on what specific management practices will be the norm and the extent to which individual variations will be allowed and how they are to be decided. We strongly recommend BLM provide specific criteria, metrics and accountability in the DPEIS to ensure that BMPs offer measurable and long-term protection of desert ecological and water resources.

Protection of Water Resources

We are particularly concerned about the lack of clear protections in the DPEIS, via BMPs or otherwise, of water resources, per the comments the Conservancy offered previously on the DPEIS. The need to create a framework that protects water resources is urgent - BLM's approval process for applications continues, with several proposed in places with critical water resources that are likely to be adversely impacted.

In the arid lands and deserts of the southwestern states, long-term conservation and protection of water resources is critical to maintaining ecosystems, habitats, and species. The siting and operation of utility-scale solar generation facilities in these arid and desert environments can have far reaching direct and indirect adverse effects The DPEIS describes many of these effects: loss of water resources; modification of the natural surface water and groundwater flow systems; alterations of the interactions between groundwater and surface water; contamination of aquifers; and water quality degradation by runoff, excessive withdrawals, or chemical leaks and spills. Of these, the most important is the loss of surface water resources linked to excessive groundwater withdrawals.

Many desert solar energy facilities intend to rely on long term groundwater pumping for their construction, operation and

maintenance. Adverse effects of this pumping can extend widely, last for a very long time, and be difficult to predict and detect, and potentially cause irreparable harm to aquifers and surface ecosystems. And, (as duly noted in the DPEIS), existing federal protection of groundwater is limited. Reliance on state and local groundwater regulations that vary widely across jurisdictions often results in placing a lower priority on protection of ecosystem needs for groundwater.

In our view, protection of desert water resources warrants strong and specific requirements for water —particularly groundwater--use by solar developers. We recommend BLM adopt comprehensive, clearly articulated water BMPs to protect scarce, at-risk groundwater resources. These BMPs should include, irrespective of state requirements the following:

1. Prohibition on any groundwater withdrawal by a solar facility from a groundwater basin that will cause or contribute to withdrawals over the perennial yield of the basin, or cause an adverse effect on ESA-listed or other special status species or their habitats over the long term. However, where groundwater extraction may impact groundwater dependent ecosystems, and especially within groundwater basins that have been over appropriated by state water resource agencies, solar projects may qualify where the developer commits to provide mitigation measures that will provide a net benefit to that specific groundwater resource;

2. All projects undertake robust hydrological studies that use all available data and accepted models that specifically define groundwater basins and surface water and groundwater interactions, sustainable yields, and long term effects, of all existing and probable withdrawals, including likely effects related to climate change;

3. Groundwater monitoring with triggering provisions that specify automatically imposed remedies for reductions in groundwater use in the event that monitoring or modeling shows that adverse effects are likely to occur, or are occurring;

4. Where existing data and models are not available to adequately describe key hydrological conditions in the target groundwater basin and affected aquifers and the effects of proposed pumping, the applicant should be required to underwrite sufficient data collection and

models as a condition of receiving federal approvals;

4. Documentation that demonstrates that the proposed project is designed to use the best available technology[3] for limiting water use that is applicable to the specific generation technology as well as during construction and operations, subject to review and additional mitigation;

5. BMPs should also include requirements for compensatory groundwater mitigation in the form of acquisition and retirement of senior groundwater water rights in multiples of the projected pumping levels, retained for conservation use. Where limited exceptions, site-specific allowances or variances from generally applicable rules are authorized, the burden of proof should lie on the project applicant to demonstrate the absence of harm when proposing an alternative course of action.

Groundwater-Specific BMPs Applicable to SEZs and Desert-Wide Sites

Nowhere are the potential impacts to surface and groundwater resources more important than in the bi-state Amargosa flow system. As we noted in our comments on the DPEIS, the proposed Amargosa Desert SEZ in Nevada is located over the extensive Death Valley Regional Flow System, which supports the ESA-listed Devil's Hole pupfish and numerous other listed, endemic, and sensitive species in Ash Meadows National Wildlife Refuge and the Amargosa River and Death Valley National Park. Water levels are declining in Devil's Hole, most likely due to regional groundwater pumping and lower recharge rates, risking extirpation of the species.

While concern for Devil's Hole is noted, the DPEIS/SDPEIS omits any significant mention of the impacts of groundwater pumping in the Amargosa Desert SEZ on aquatic and riparian species in two key BLM protected areas downstream in California: the Amargosa ACEC and Wild and Scenic River.

The US Geological Service (USGS) regional groundwater flow model and very recent geochemical and hydrologic studies of the Amargosa basin in the Tecopa and Shoshone area suggest that flow from the north (i.e., from the Amargosa Valley area) may be an important contributor to maintaining perennial water in the Amargosa River Wild and Scenic segments, and tributary streams and springs. While the area is hydrologically complex, pumping in Amargosa Valley could well adversely affect the Wild and

Scenic River flow, BLM's ACECs in the area, as well as sensitive and ESA-listed species that depend on the river and spring flows (e.g., Amargosa vole, least Bell's vireo, Amargosa pupfish, and several rare plants) Before this SEZ is finally approved or the siting or approval of any solar projects in the Amargosa or Pahrump Valley areas are considered, the long term cumulative effects of all groundwater withdrawals from this flow system on protected ecological resources must be understood and considered.

In our previous comments on the DPEIS, we recommended elimination of this SEZ. While the SDPEIS proposed a significant reduction in the size of Amargosa Valley SEZ (eliminating areas near and in the Amargosa River floodplain), this SEZ is still included, despite objections from multiple agencies and other interested third parties. There are at least six applications for solar facilities in nearby and hydrologically linked Pahrump Valley and four in the Amargosa Valley itself, including the approved (but apparently on hold) Solar Millennium plant. The cumulative effect of all of these plants using groundwater from the interconnected Death Valley Regional Flow System is not dealt with in the DPEIS/SDPEIS. As we noted previously, regional groundwater pumping by existing sources is already a serious concern in this groundwater, in 2009, more than double the perennial yield of the basin was withdrawn. Approved basin allocations exceed perennial yield by over 18,000 acre feet per year. The water requirements of the possible solar plants in this SEZ and surrounding areas will clearly exacerbate this situation. As we urged in previous comments, this SEZ should be cancelled and we urge as well that existing applications be put on hold until this groundwater system is understood more fully.

The Role of State and Local Water Law and Regulations

The Conservancy continues to find strong federal authority exists for BLM to limit harmful groundwater withdrawals from BLM-administered lands, a position which should be asserted in the final Solar PEIS. Please see our previous comments on the DPEIS for a thorough explanation of BLM's important role and responsibilities in managing surface and groundwater resources irrespective of state and local water laws.

Mitigation: A Framework for Lasting, Tangible Results

BLM has the opportunity to create an effective mitigation framework that protects public lands with measures that deliver lasting, tangible results. As the basic rule of thumb, BLM should ensure all mitigation be additional, enduring, monitored, account for the full cumulative impact of projects, and be at a sufficient scale to ensure ecological viability.

Per our comments on the DPEIS, we urge BLM to explicitly integrate the Council of Environmental Quality (CEQ) January 14, 2011 guidance titled "Appropriate Use of Mitigation and Monitoring and Clarifying the Appropriate Use of Mitigated Findings of No Significant Impact" into a revised Supplement or the Final PEIS. Adopting this recommendation would address many of the needs of the DPEIS regarding mitigation and monitoring.

Existing NEPA requirements, project design elements, mitigation, monitoring, and adaptive management mechanisms currently proposed in the DPEIS are inadequate to provide full protection for desert resources and compensate for harm. Full integration of the CEC recommendations will require BLM to amplify and modify numerous provisions of the DPEIS that are inconsistent with that guidance--or simply do not address the measures and steps articulated in the guidance as appropriate when addressing mitigation and monitoring in a NEPA analysis.

Additionally, we recommend the DPEIS incorporate robust measures for both monitoring and adaptive management. Monitoring assesses the actual (as distinct from projected or predicted) impacts of solar development, and demonstrates the success or failure of measures designed to avoid, minimize or offset impacts, and allows BLM to craft and impose adaptive measures to correct harm.[4]

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[4] As stated in BLM's guidance on preparing NEPA analyses: "In a record of decision (ROD), a monitoring and enforcement program shall be adopted and summarized where applicable for any mitigation (40 CFR 1505.2(c)). The ROD must identify the monitoring and enforcement programs that have been selected and plainly indicate that they were adopted as part of the agency's decision (see Question 34c, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*). The ROD must delineate the monitoring measures in sufficient detail to constitute an enforceable commitment, or incorporate by reference the portions of the EIS that do so (see Question 34c, CEQ, *Forty Most Asked Questions Concerning CEQ's NEPA Regulations, March 23, 1981*). "

Creating a Mitigation Framework: The Mitigation Hierarchy

The Nature Conservancy believes that BLM can devise and implement mitigation protocols that benefit both people and nature. We have learned in our experience as land managers that conservation and human uses can co-exist when human uses, such as solar energy development, observe a common sense and practicable mitigation hierarchy based on avoidance, minimization, and mitigation (offset) of harm. The DPEIS and the SDPEIS are largely silent on many aspects of the mitigation hierarchy; the intent of our recommendations is to demonstrate how BLM can use the mitigation hierarchy as the basis of a solar energy program.

Critically, in the formulation of a mitigation framework for solar energy development, one foundational conclusion must be drawn from in the DPEIS: current utility-scale solar technologies permanently eliminate habitats and displace species, as well as eliminate all other uses of BLM-administered lands. As a result, on-site mitigation is largely impossible, leaving off-site mitigation the primary (if not the only) option. This is a significant oversight and lost opportunity within the DPEIS/SDPEIS- the final Solar Programmatic EIS must have a robust mitigation offset program, a program that seeks a "no net loss" baseline in terms of both acres and habitat values, based on identification of lands (public and private) of high ecological value that could be available and used to mitigate ecological impacts.

The Mitigation Hierarchy: Avoidance and Minimization

In the first step, avoidance, the mitigation hierarchy calls for solar energy facilities to be sited in locations that avoid the most ecologically important and/or sensitive habitats entirely. Per earlier comments, we applaud BLM for significantly improving avoidance in the SDPEIS (please see our comments in *Role and Use of Landscape-scale Ecological Assessments* and *Adding New or Modifying Existing Solar Energy Zones)*. We reiterate our recommendation that BLM use landscape-scale ecological assessments to identify and avoid areas and associated species and habitats that are ecologically core, sensitive and/or intact. Further, to successfully ensure and maintain ecological viability across the arid and desert Southwest, in addition to the Revised Areas of Exclusion in Table 2.2-1, and to specifically delineate Section D 3.3, "Additional Locally Relevant Screening Criteria, " we recommend that the following

areas be specifically avoided (i.e., included in Table 2.2-1) for solar development:

1. Ecologically Core lands identified in The Nature Conservancy's 2010 Mojave Ecoregional Assessment;

2. Category A lands identified in The Nature Conservancy's 2009 California Sonoran Assessment;

3. For areas outside of the Mojave and Californian Sonoran, portfolio sites identified in The Nature Conservancy's "first generation" of ecoregional assessments, completed between 1996 and 2005, which collectively represented the best remaining areas to conserve an ecoregion's full array of biodiversity, including natural communities as well as the rare, unique and endemic species that may have very specific habitat requirements.

Additionally, we recommend BLM revise the proposed SEZs in the SDPEIS so that they do not include these important conservation lands - please see the Appendix for our comments and detailed assessment of proposed SEZs.

In the second step of the mitigation hierarchy, minimization, facilities should be sited and operated in a manner that avoids or minimizes harm to habitats and species. This means identifying, developing, and employing BMPs that have been determined to be applicable to a given solar energy project and that actually limit harm to habitats and species. These BMPs would also specify which monitoring and enforcement mechanisms are applicable and should be adopted. Adaptive management should also be included in the BMPs to allow project modification based on the results of monitoring the actual, as distinct from projected, ecological impacts of the solar energy project, taking into account variances over time from the ecological conditions that may have been initially presumed to be stable over the projected life of the project. Please see our recommendations under *Best Management Practices* for more detail.

The Mitigation Hierarchy: Offset of Unavoidable Impacts - A Compensatory Mitigation Program

For those impacts that cannot be avoided or minimized, effective measures must be taken in the face of unavoidable negative impacts to affected habitats and species to ensure viability of species and habitats over time. A successful mitigation framework established in the DPEIS must a way to offset impacts,

i.e. a compensatory mitigation program, that is adaptable to differences in SEZs, individual projects and technologies. It must reflect varying availabilities of private lands. It must account for the full cumulative impact of projects across a landscape, and be at a sufficient scale to ensure ecological viability. It must be as enduring and long-lasting as the impacts, i.e. in perpetuity.

To ensure unavoidable impacts are fully offset, the Conservancy recommends that BLM establish an off-site mitigation program within the mitigation framework that, in addition to acquisition of private lands, allows mitigation on BLM-administered lands where impacts cannot be addressed through acquisition and long-term management of private lands; allows "mitigation banking" on BLM-administered lands where conservation designation and/or management can achieve mitigation needs/outcomes relative to specific impacts to habitats and associated species; ensures adequate funding over time to achieve mitigation outcomes; creates third party-managed endowments of mitigation funds to manage and direct mitigation investments and activities; and ensures monitoring and adaptive management to ensure mitigation is adequate relative to impacts over time.

Adequate mitigation is unlikely to be achieved by attempting to treat each project, and the required offsets of that project, separately. This "one off" approach historically has resulted in a patchwork of small "mitigation offset" sites that are of insufficient scale and connectivity to be ecologically viable, or to actually fully offset impacts over time. We recommend the DPEIS explicitly address the need to focus mitigation investments (offsets) from a number of projects collectively to increase the likelihood of actually achieving an effective and enduring offset of ecological impacts, along with establishing priority mitigation areas to focus mitigation investments will also greatly facilitate future NEPA analysis of future proposed SEZs or projects, provide more certainty and predictability for developers, and will result in the expedited production of solar energy. Through its recommendation to create "regional mitigation plans" as outlined in the SDPEIS, we believe that BLM has provided an avenue to develop a robust compensatory mitigation program.

Following are the Conservancy's specific recommendations on the elements of an off-site, compensatory mitigation program as the basis of regional mitigation plans, including recommendations on how BLM could "build-out" and test the elements, while ensuring robust stakeholder involvement.

Elements of a Regional Mitigation Plan

A regional mitigation plan encompasses a robust compensatory mitigation program that consists of the following six elements:

1. An ecological baseline upon which unavoidable impacts are assessed.

   What is the current ecological status of the landscapes to be developed? What is the habitat quality and level of intactness, where do the species occur and what is their population status and viability? What species are rare, sensitive, endemic, threatened, endangered? What are the aquatic, surface water and groundwater resources and what is their status? Where are the wildlife migratory corridors, where is connectivity of habitats critical in the face of climate change? What ecological trends are underway and how do we expect them to impact species and habitats?

   The information and data to inform these and other questions form the ecological baseline from which to assess the impacts, both site specific and cumulative, from solar energy development. Obviously, this baseline is not static – in addition to solar energy development many other factors are at play that will influence the baseline one way or another for specific species and habitats over time. Thus, to the extent feasible, new data and analysis need to be incorporated into the baseline to ensure its viability.

   To ensure an adequate (and efficient) ecological baseline, we recommend:

   a. BLM commit to using existing, best available science as the basis for the landscape scale (and finer scale) ecological baseline, and specifically analyses to support the DPEIS, BLM REA's, the CA DRECP, the BLM West Chocolate Mountains EIS, the BLM Restoration Design Energy Project in Arizona, existing RMPs, existing HCP and Biological Opinions, State Wildlife Plans, and assessments listed in Appendix D under D.3.3 (those not listed here). This is in truth not as daunting as it might seem, as many of these efforts overlap and borrow from one another
   b. BLM commit to a "process" to incorporate new landscape scale (and finer scale where appropriate) ecological data as it becomes available to ensure the ecological baseline

reflects the best available science and changing conditions of the landscape(s). BLM's AIM seems a logical, appropriate vehicle to do this, as well as any efforts to identify and create new zones.

2. A mechanism to assess & quantify unavoidable impacts over the life of the impacts.

   There is a large and growing body of work to develop mechanisms or methodologies to assess impacts from development. BLM has participated in the development of several, and a wide array created by BLM, other federal and state agencies, academia, consultants, etc. have been used to assess impacts on BLM-administered lands. Whatever methodology BLM commits to using, it should be transparent, meaning not a "black box," and based on best available scientific techniques. It should capture impacts beyond those to federal and state ESA-listed species, BLM Species of Concern and Sensitive Species, and habitats protected under the Clean Water Act. It must be able to specifically capture cumulative impacts, and the temporal nature of impacts, i.e. over the life of the impact (likely in perpetuity). Most importantly, BLM should commit to **one** methodology and ensure that it is used consistently by all BLM jurisdictions for every solar energy project.

3. A methodology to translate the impacts into dollars, i.e. mitigation investments – including sufficient funding to manage and monitor the mitigation investments.

   Similar to (2.) above, extensive work has gone into and continues occur to develop methodologies to translate ecological impacts into dollars or mitigation investments and actions, often as part of a methodology to assess ecological impacts. Again, it should be transparent, BLM should commit to one and ensure it is consistently used by all BLM jurisdictions for every solar energy project.

   Importantly, the costs of assessing the impacts, and the monitoring and managing the mitigation investments over the life of the impacts needs to be included in the cost of mitigation, and thus the amount of mitigation investment that the developer is responsible for. However, the costs of mitigation cannot be so high, or unreasonable, that development cannot occur – a key facet is to avoid impacts to areas that are "unmitigatable," i.e. ecological resources that cannot be replaced or are extremely rare, or

where the impacts are so extensive as to drive the costs of mitigation to a level beyond a reasonable level.

4. A structure to hold and apply mitigation investments.

   This should be a 3rd party arrangement (BLM cannot hold mitigation funds) with fiduciary responsibility (and demonstrated fiduciary experience) to hold, manage and allocate mitigation investments. At a minimum, structures should be regionally/landscape or state based to ensure mitigation investments are responding to impacts on the specific landscape being impacted. We recommend, at a minimum, representation by BLM, State F&G agencies, and the USFWS. However, we believe in and recommend involvement by key stakeholders, in some sort of advisory and oversight role, i.e. counties, conservation community, industry, sportsmen/recreation, etc.

5. A prioritization, e.g. conservation plan, as to where and how mitigation investments should be made.

   Where and how should mitigation investments be used to ensure the highest return on investment? What "tools" should be used to implement mitigation, i.e. land acquisition, withdrawing BLM-administered lands from other uses, changing land designations or uses, restoration, mitigation banks, etc. How are conservation priorities established, especially relative to potential impacts?

   At a minimum, we recommend BLM develop a regional conservation plan for each region or landscape that will have impacts, i.e. for each regional mitigation plan. BLM should use existing, best available plans as the basis for establishing conservation priorities, i.e. BLM RMPs, the CA DRECP, State Wildlife Plans, HCPs, County land use plans, etc. Each conservation plan should seek to prioritize actions to address conservation priorities to achieve the best conservation return on investment.

   N0te, mitigation investments, to the greatest extent practicable, should be additive to existing and/or other required conservation management actions BLM is responsible for to maintain the ecological health of our public lands.

6. Monitoring to ensure mitigation investments are adequate relative to impacts over the life of the impacts, with a feedback loop to ensure the mechanism to assess and quantify the impacts and the methodology to translate the

impacts into mitigation investments adequately reflect sufficient mitigation.

Monitoring and adaptive management are key to a successful mitigation program. We recommend BLM establish an adaptive management program (i.e. specifically implement AIM across the region) with long term monitoring and specified triggering conditions for modifications to existing approval conditions. To be effective, adaptive management requirements must be backed by solid developer financial assurances and require alteration in plant-specific and solar program mitigation and design requirements where adverse impacts exceed original estimates, without requiring a formal permit modification process. This requires BLM adopt a formal program to require plants to monitor and report adverse effects and then adaptively alter plant actions, ensuring that new data and lessons learned about the impacts of solar energy projects will be reviewed and incorporated on an ongoing basis into **both** existing individual plant authorizations and into the overall solar energy program.

Note this is not to seek additional mitigation from the developer for a specific project once mitigation has been established. This is solely to ensure that the mechanisms are adequate for mitigation of future projects, while also updating the ecological baseline.

Building and Testing a Regional Mitigation Plan and Compensatory Mitigation Program

Mitigation is a conundrum BLM faces on a regular basis, it is by no means limited to solar energy development. To flesh out the elements of a compensatory mitigation program such that BLM could incorporate appropriate input into the DPEIS, we recommend BLM work with key stakeholders with experience in the science of developing and implementing mitigation and mitigation programs via a workshop or series of workshops. Specifically, the workshop(s) would address:

a. Which methodology or mechanism would best suit BLM's needs to assess impacts?
b. Which methodology or mechanism would best suit BLM's needs to translate impacts into dollars, i.e. mitigation investments?
c. What should a conservation plan contain, and what process would best serve to manage and update it?

d. What are the best examples of 3rd party fiduciary structures to manage and deliver mitigation investments?
e. What are the array of "tools in the toolbox" to accomplish mitigation on the ground?

These are just some of the issues a workshop would or could seek to elucidate. The workshop need not focus specifically on the Solar PEIS, though could certainly capture specific, unique elements of solar development to ensure BLM is receiving needed input as it moves forward in developing regional mitigation plans and a compensatory mitigation program under the Solar PEIS.

Additionally, BLM should initiate two pilots for advance regional mitigation planning, one for the Riverside East SEZ and one for the Amargosa Valley SEZ. These pilots should focus on identifying areas that should not be developed within the SEZ (avoidance), BMPs specific to that SEZ (minimization), an evaluation of what restoration is likely to be effective within the SEZ, given the vegetation communities within the SEZ (restoration) and , finally, on developing each of the six elements to plan for compensatory mitigation. We believe that the Riverside East SEZ should be a pilot project given the number of applications already proposed in the SEZ and the benefit that a comprehensive mitigation plan could provide. Furthermore, the regional SEZ mitigation planning for Riverside East should be folded into the Desert Renewable Energy Conservation Plan. Lastly, there have already been some issues identified with a sensitive and geographically limited vegetative community within the Riverside East SEZ: microphyll woodlands. A Riverside East SEZ mitigation pilot will provide the opportunity to establish the type of assessment that is necessary in determining the level of impact acceptable for a sensitive and geographically limited ecological resource. In particular, the pilot project should evaluate the potential for compensatory mitigation to offset impacts to microphyll woodlands. If the analysis finds that there are likely not enough microphyll woodlands on private lands that could serve as mitigation, this vegetative community would need to be avoided as part of the mitigation framework. The Amargosa Valley SEZ is also an important area for a pilot project, in particular because it will serve as an example of how to analyze and address sand transport and sand source issues as well as a critical opportunity to establish SEZ-specific groundwater extraction BMPs, including monitoring, modeling and mitigation protocols.

Management of Pending (Existing) Applications

Since 2008, solar energy developers have filed hundreds of ROW applications covering millions of acres of BLM-administered land in the DPEIS study area. In the California Desert District alone, there were at one time more than one hundred "active" solar development applications covering more than 600,000 acres. The need for a programmatic review of potential solar energy development was evident.

With the release of the DPEIS, opportunities arose to better review and manage existing applications (those submitted prior to June 30, 2009) and new applications (those submitted between June 30, 2009 and the date that the ROD for the final PEIS is signed). The approach for managing these existing and new applications is fundamental to meeting the Secretary's vision as he described it on June 29, 2009: "This environmentally-sensitive plan will identify appropriate Interior-managed lands that have excellent solar energy potential and limited conflicts with wildlife, other natural resources or land users…with coordinated environmental studies, good land-use planning and zoning and priority processing, we can accelerate responsible solar energy production that will help build a clean-energy economy for the 21st century."

Both existing and new applications have the potential to make meaningful progress toward building the clean-energy economy captured in the Secretary's vision. However, these applications also have the potential to undermine or conflict with the environmental, land-use planning and zoning vision that the Secretary articulated. The goal of BLM in reviewing existing applications should be to approve solar energy developments in a manner consistent with the vision and objectives of a final PEIS (as it would be for new applications). To accomplish this, and to improve management of all applications, new and existing, we offer the following recommendations.

Pending Right-of-Way (ROW) Applications

The SDPEIS states that BLM will continue to process pending applications in an effort to facilitate *environmentally responsible* solar energy development (emphasis added). This is an important guiding principle for the type of approach that The Nature Conservancy is advocating. Our recommendations below are intended to provide criteria for prioritizing and processing pending applications that have the greatest likelihood of

successfully being permitted and that will meet the goal of being environmentally responsible. At the same time, our recommendations include criteria that will flag projects that are likely to cause a high degree of conflict and, consequently, should be denied. This approach will facilitate BLM's ability to focus its capacity on the critical components of building a long-term solar program: applications within the zones, the creation of new zones and regional mitigation planning for each SEZ.

In an effort to find common ground with the industry, we recommend that the pending applications listed in the SDPEIS should be processed under current rules, not new rules as suggested by the SDPEIS (unless they reflect existing rules and/or IMs) or those codified in a PEIS ROD. Some of the existing applications make us distinctly uncomfortable; however, we believe the NEPA process for these applications will ensure that only the best projects will go forward.

In screening these projects using existing guidance, the best available information and data should be used to determine if a pending application will cause a high degree of conflict or if it is likely that it will impact an area that is important at a landscape scale. If the analyses that BLM conducted to determine exclusions areas in the SDPEIS or Final PEIS have identified areas that present a high degree of conflict or landscape-scale importance, these analyses (and not the designation of excluded lands) provide the basis for rejecting inappropriately sited existing applications.

In addition, there are four categories we recommend for immediate rejection of ROW applications:

1. All pending applications determined by the BLM to be in "high-conflict" areas, per the environmental screens proposed by the California Desert and Renewable Energy Working Group in December 2010;
2. Pending applications that meet the criteria for "High Potential for Conflict" described in IM 2011-061 (BLM 2011b);
3. Pending applications proposed in an area that is identified as core to meeting landscape-scale goals for conservation. Solar energy facilities should not be sited in locations that contain the most ecologically important, sensitive or intact habitats. A robust, landscape-scale ecological assessment should be the basis for identifying avoidance areas or areas where applications will not be accepted. The Nature Conservancy has already completed landscape-scale

analyses in each of the ecoregions considered in the DPEIS. **To successfully maintain ecological viability across the arid and desert Southwest US, we recommend that applications in the following areas be rejected (i.e., included in the areas identified as inappropriate for solar development):**

a. Ecologically Core lands identified in The Nature Conservancy's 2010 Mojave Ecoregional Assessment;
b. Category A lands identified in The Nature Conservancy's 2009 California Sonoran Assessment;
c. For areas outside of the Mojave and Californian Sonoran, portfolio sites identified in The Nature Conservancy's "first generation" of ecoregional assessments, completed between 1996 and 2005, which collectively represent the best remaining areas to conserve an ecoregion's full array of biodiversity, including natural communities as well as the rare, unique and endemic species that may have very specific habitat requirements;

4. Right of way applications that were filed after June 30, 2009 on lands that BLM excluded from solar development in the Draft PEIS, except where a more recent application is filed to partially relocate an existing project application to a nearby area to avoid conflicts.

Finally, because the BLM has limited capacity to process existing applications and implement a new solar program (e.g., evaluate and designate new solar energy zones, complete regional mitigation planning,), BLM should prioritize their efforts to focus first on processing existing applications within established SEZs and then existing applications that appear to present low conflict.

New ROW Applications

All New ROW applications (those not listed in the SDPEIS as pending applications) submitted should receive no further processing until the ROD for the PEIS is signed, when then become subject to the terms of the final Solar PEIS. Finally, we recommend that no new applications be accepted from this point until the record of decision (ROD) is signed for the final Solar PEIS. Precluding new applications will eliminate confusion for new applicants and give BLM the opportunity to complete pending applications.

Comments on the Preferred Alternative: The Variance Process

The Nature Conservancy is supporting the modified SEZ program alternative in SDPEIS for the reasons expressed earlier in this document - this alternative allows for near term development through the processing of the existing applications both inside and outside of zones, promotes additional applications in existing zones and includes a process for the creation of new zones. Combined, these three paths allow for quickly moving forward to meet our clean energy goals while also protecting the ecological values and other uses of public lands.

We do not support the modified Solar Energy Development Program alternative for a number of reasons. Most importantly, the variance process opens up far too much ecologically important land to potential development and would be likely to result in scattering projects across the landscape, fragmenting Southwest desert habitats. Pursuit of variance applications will strain BLM's already stretched staff resources, diverting the agency from processing zone-based applications that will benefit from advanced development and mitigation planning, and from establishing new zones to ensure robust development of solar energy on BLM-administered lands. Variance applications will also significantly complicate transmission planning. In sum, creation of a variance process that is not carefully limited will undercut and denigrate the zone-based approach that will speed approvals of projects sited in low conflict locations that SEZ represent and that BLM has strived to create.
If it is included, the variance process needs to be structured in such a way as to support the implementation of a zone-based approach. Variance applications must remain circumscribed exceptions, and areas within which variance applications will be accepted reined in by far tighter criteria that those used in creating SEZs. These stricter standards are needed to ensure that both the developers and the agency focus planning, siting and permitting resources on appropriate SEZs. BLM can then apply its limited capacity towards planning for directed development within SEZs, the creation of new SEZs as needed, and on regional mitigation for the anticipated unavoidable impacts.

The Nature Conservancy asserts that the variance process, if implemented, should maintain ecological viability across the arid and desert Southwest US by accepting and processing only exceptional project applications in areas with low ecological resource values, the least possible conflicts with other important uses, and posing minimal conflicts with adjacent

lands. Accordingly, we recommend that the following areas be excluded from lands open to variance applications:

1. Ecologically Core lands identified in The Nature Conservancy's 2010 Mojave Ecoregional Assessment;

2. Category A lands identified in The Nature Conservancy's 2009 California Sonoran Assessment;

3. For areas outside of the Mojave and Californian Sonoran, portfolio sites identified in The Nature Conservancy's "first generation" of ecoregional assessments, completed between 1996 and 2005. These sites collectively represent the best remaining areas to conserve an ecoregion's full array of biodiversity, including natural communities as well as the rare, unique and endemic species that may have very specific habitat requirements.

4. Lands with wilderness characteristics outside Wilderness and Wilderness Study Areas that have been identified in an updated wilderness characteristics inventory.

5. Sensitive habitat areas, including priority sage grouse habitat, riparian areas, or areas of importance for Federal or state sensitive species.

6. Wildlife Habitat Management Areas (WHMAs) established by the BLM in its management plan for the California Desert Conservation Area, and subsequent amendments to the plan.

7. Sand transport corridors and sand source areas.

8. Dissected fans across range of the threatened desert tortoise[5]

9. In California and Nevada, the Ivanpah and Pisgah Valleys.

10. In Nevada, seven spring landscapes: Amargosa Desert, Railroad Valley, White River Valley, Pahranagat Valley, Upper Muddy River, Steptoe Valley and Soldier Meadow.[6] These seven landscapes capture almost 100 biologically important species dependent upon spring ecosystems.

[5] As described in the biological opinions for the Blythe, Genesis and Desert Sunlight solar projects in California.
[6] As mapped in the Nevada Springs Conservation Plan (Abele, 2011).

11. All exclusion areas listed in Table 2.2-1 in the SDPEIS.

12. Any areas identified under "Additional Locally Relevant Screening Criteria" as outlined in the SDPEIS in Appendix D, D.3.3.

We strongly support that protection for desert tortoise habitat and populations in the variance process should be a requirement rather than a factor to be considered. While we believe that Option 2 lays out some important factors in this requirement, we would recommend that the requirement take into consideration desert tortoise habitat in addition to density in defining exclusion areas.

For variance projects seeking sites in areas overlying desert groundwater aquifers where projects will rely on groundwater withdrawal it is critical that the variance process, if adopted, take into consideration the state of each groundwater basin and require variance applications to recognize and address conflicts related to groundwater pumping. In basins or aquifer systems that are presently over-appropriated and/or in overdraft, those in which cumulative groundwater pumping is now or reasonably anticipated to be in excess of sustainable yield, or those in which groundwater pumping may have adverse impacts, even over very long time periods, on groundwater-dependent ecosystems, variance applications should be considered only where the applicant conclusively demonstrates that its proposed levels of groundwater withdrawals will not cause or contribute to any long term[7] adverse effects on aquatic, phreatophytic or riparian resources ,and its withdrawals will be more than offset by a net improvement in the quantity and quality of basin or aquifer system groundwater resources through sufficient mitigation.

For those basins or aquifer systems in which groundwater hydrology is not sufficiently understood to model and provide reasonable assurances of the long term[8] effects of withdrawals, project proposals under the variance process should include a commitment by the applicant to fund adequate studies to determine those effects as well as a commitment to accept permit limitations that condition its continued use of groundwater or mitigation requirements to more than offset impacts based on the outcome of the studies.

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[7] In this context, long-term refers to the longer of 200 years, or the period over which adverse groundwater effects may occur.

We also recommend that BLM reduce variance application areas designated in the SDPEIS, particularly in Nevada. DOI and BLM noted strong opposition to the Program Alternative in summarizing the 80,500 comments it received on the DPEIS. Much of the opposition focused on the large number of inappropriate acres the program would open to solar development across the Southwest. The variance process proposed in the Supplement has only slightly less acreage available for applications across the six-state region (with 20,324,863 acres available for applications rather than 21,581,154 acres). While the agency's proposal provides some additional guidance on factors to be considered in approving variance applications, the SDPEIS actually increases the acres open for potential development in Nevada over what was considered in the DPEIS (9,207,288 acres under the variance process, up from 9,084,050 acres open under the DPEIS's Solar Program alternative). Opening more than nine million acres for development in Nevada will actively discourage a directed development program based on SEZs. Based on the maps in the SDPEIS, it also appears to open up every single valley in the southern basin and range system for development. Protecting the intact connectivity that links one range to another through an intact basin provides many important values. These intact systems are important wildlife corridors and are areas that will be critical for the adaptation of plants and animals given climate change. Spring systems especially, with their highly restricted endemic populations of native fishes and spring snails are particularly at risk with such expansive development and contrary to the recommendations recently advanced by the Nevada Springs Conservation Plan (Abele, 2011). Presumably, development of power lines at the proposed scale would provide ravens with a vastly higher number of perch sites and facilitate their predation on desert tortoise. Finally, by opening up this many acres to potential development, the BLM would be putting at risk the Nevada dune beardtongue, the distribution of which overlaps with the variance acreage by approximately 61%. The BLM should complete a Nevada dune beardtongue conservation plan and remove specific areas from the variance process to ensure the viability of this sensitive plant species.

Appendix: Ecological Analysis of the Supplement to the Draft Solar PEIS Alternatives

The SDPEIS proposes three alternatives for managing solar energy development on BLM-administered lands in six southwestern states over the next 20 years. The Nature Conservancy has assessed how the proposed alternatives could affect biological diversity by using spatially explicit information about the conservation value of lands and waters derived from ecoregional assessments. Completed by the Conservancy and its partners, these ecoregional assessments collectively cover the Mojave Desert Ecoregion and the portion of the Sonoran Desert Ecoregion contained within California. The assessments permit the Conservancy to provide probative, science-based comments on the SDPEIS within these regions.

Ecoregional assessments are comprehensive and systematic efforts to identify conservation priorities. The "first generation" assessments, completed between 1996 and 2005, identified "portfolios" of sites that collectively represented the best areas to conserve representative plants, animals, and natural communities on lands within an ecoregion. More recently completed "second generation" assessments, including the updated Mojave Desert Ecoregional Assessment (2010) and the Framework for Effective Conservation Management of the Sonoran Desert in California (2009), used the same basic methodology as the first generation assessments but differed by providing "wall-to-wall" classification of all land in these regions into one of four conservation value categories based upon the presence of ecologically representative species and natural communities coupled with the quality of habitat: Ecologically Core, Ecologically Intact, Moderately Disturbed and Highly Converted. These second generation assessments were designed to inform regional land use planning in addition to identifying regional conservation priorities. For more information on the approach used to conduct the second generation assessments, see Randall et al. (2010; http://conserveonline.org/workspaces/mojave/documents/mojave-desert-ecoregional-2010/@@view.html).

Acres Opened for Development

Drawing upon the second generation assessments, the Conservancy began its analysis of the proposed alternatives in the SDPEIS using the Reasonably Foreseeable Development Scenario as defined

in the original DPEIS and reiterated in the SDPEIS. This scenario projects a need for 214,119 acres of BLM land and 71,370 acres of other lands for solar energy development in the 6 states by 2030. The amount of BLM land available for Right Of Way (ROW) applications would be much greater than this scenario requires under all three alternatives presented in the SDPEIS: by a factor of over 450 under the No Action Alternative (97,921,069 acres), by a factor of nearly 100 under the Modified Solar Energy Development Program (Modified Program) Alternative (20,324,863 acres), and by more than 71,000 acres under the Modified Solar Energy Zone Program (SEZ) Alternative (285,417 acres). Even recognizing the flexibility needed by developers in siting, it appears that the Modified Program and the No Action proposed alternatives still open far more acres of publicly owned land for solar development than is necessary.

The consequence of opening an excess of acres to development is placing more core ecological areas at risk of conversion and degradation. Within the Mojave Desert Ecoregion and the Sonoran Desert of California, the No Action Alternative would expose over 3.4 million acres of Ecologically Core lands to solar development (Table 1). Ecologically Core lands are those identified as having the highest conservation value by the Nature Conservancy and partners. The Modified Program Alternative would open nearly one million acres of Ecologically Core lands to potential solar development, over 28% of the land that would be open to ROW applications within these regions. Within California and Nevada, the SEZ Alternative exposes a total of 172,421 acres to ROW application, of which 51,948 acres (over 30% of the total area of the SEZs within this region) overlaps with Ecologically Core areas. While the SEZ alternative exposes a substantial area of the highest conservation lands to development, the total area of these lands is far less than those exposed under the Modified Program Alternative or the No Action Alternative.

The high degree of ecological intactness of the Mojave Desert Ecoregion and the Sonoran Desert of California, along with the presence of representative species and natural communities in numerous locations, led the Nature Conservancy to designate a significant portion of these desert regions as either Ecologically Core or Ecologically Intact. Large expanses of this landscape are mostly undisturbed, and together they constitute one of North America’s last great wilderness areas. Disturbance of these desert areas through solar development could have significant and long-lasting impacts on the ecological function

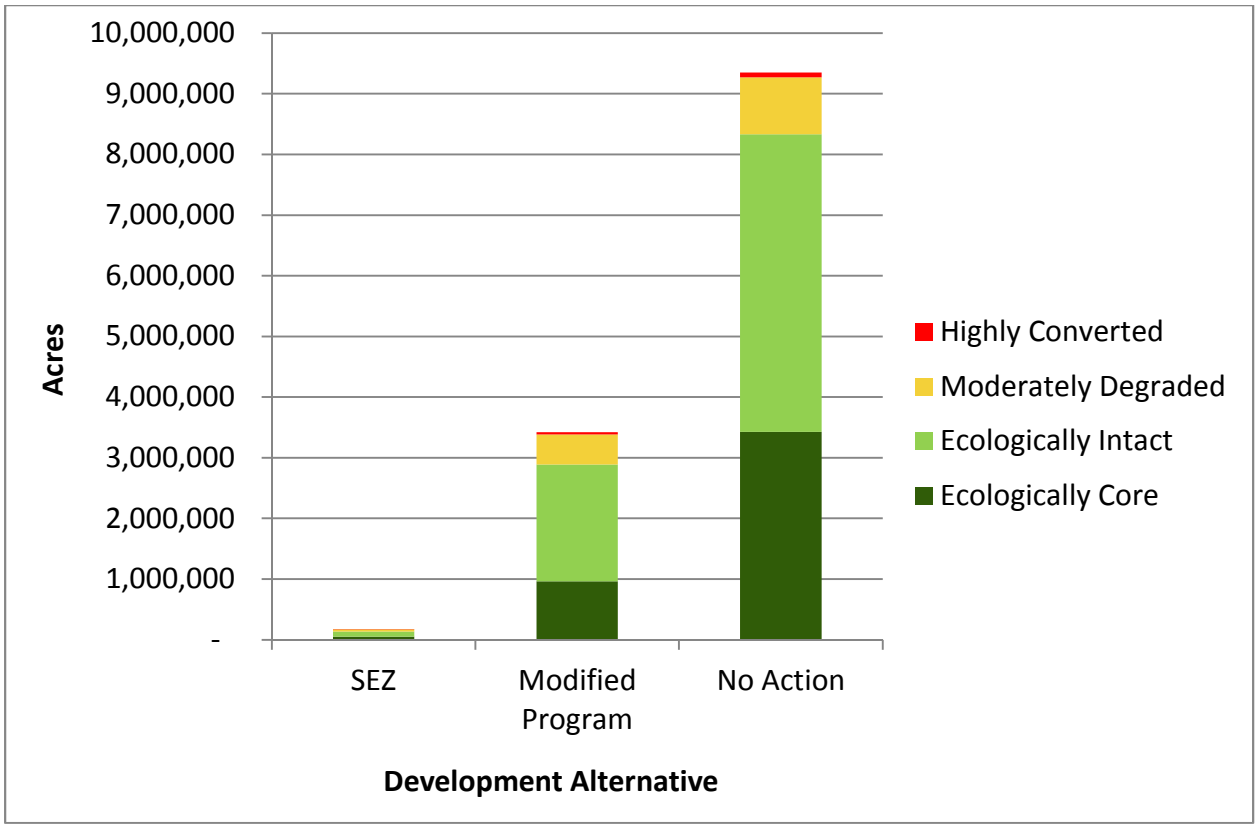
of the larger system, in addition to consequences for species viability throughout these desert regions.

Table 1. Conservation Values of the Lands Available for ROW Applications in the Mojave Eco-region (California and Nevada)and the California Sonoran under the Three Alternatives

SDPEIS Alternatives	Ecologicall y Core	Ecologically Intact	Moderately Degraded	Highly Converted	Grand Total
Modified SEZ	51,948	83,937	36,090	446	172,421
Modified Program*	962,369	1,923,417	498,928	36,437	3,421,151
No Action*	3,424,451	4,906,470	939,918	77,798	9,348,637
SDPEIS Alternative	**Ecologicall y Core**	**Ecologically Intact**	**Moderately Degraded**	**Highly Converted**	
Modified SEZ	30%	49%	21%	0%	
Modified Program	28%	56%	15%	1%	
No Action	37%	52%	10%	1%	

*SEZ areas are not included in the analysis of lands under the Modified Program Alternative and No Action Alternative.

Figure 1. Acres of Land Available by Conservation Value Category for ROW Applications under the Three Alternativeslocated in the Mojave and California Sonoran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Acres
SEZ
Modified Program
No Action
Development Alternative
Highly Converted
Moderately Degraded
Ecologically Intact
Ecologically Core

Figure 2. Land Conservation Values: No Action Alternative

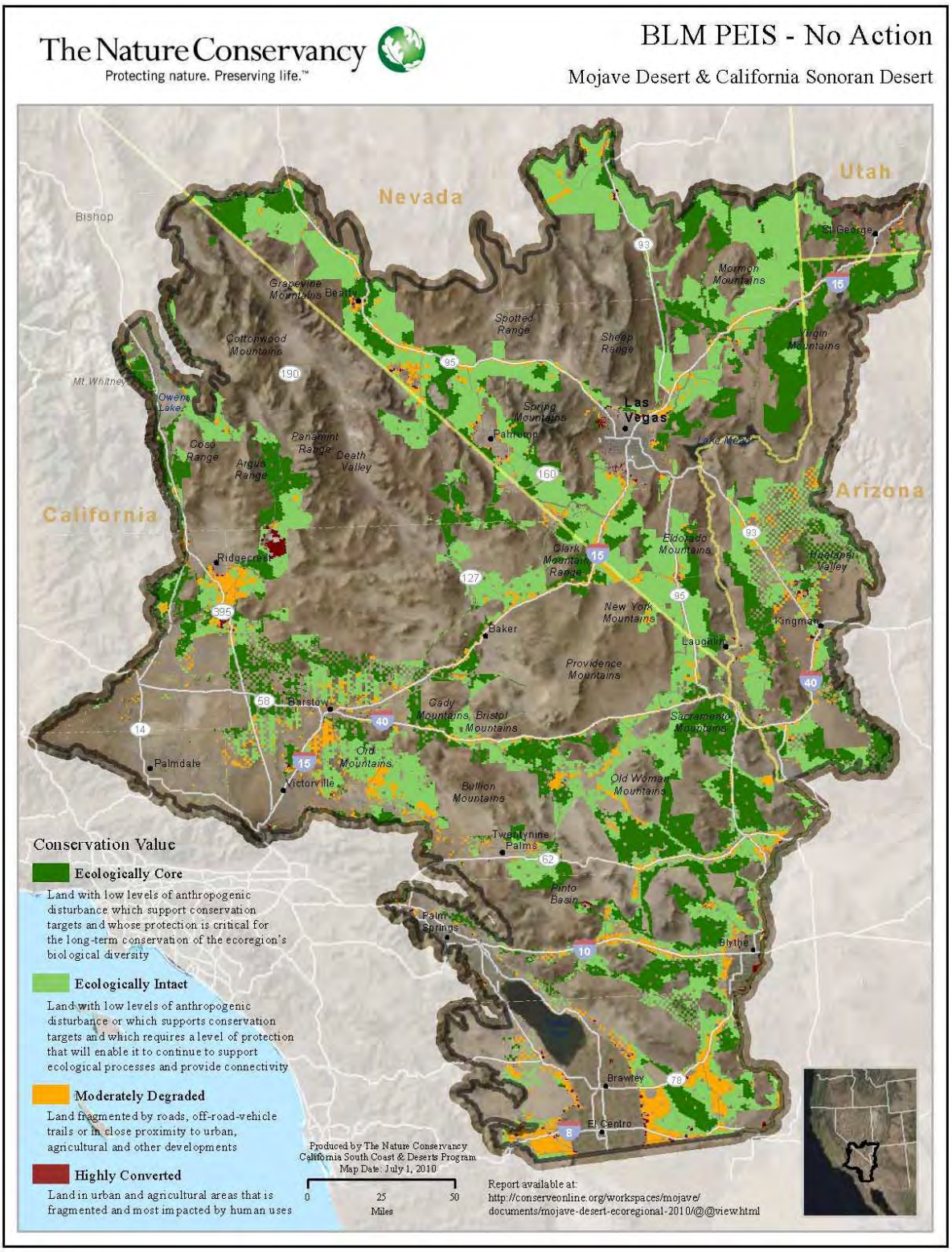


Figure 3. Land Conservation Value: Modified Program Alternative

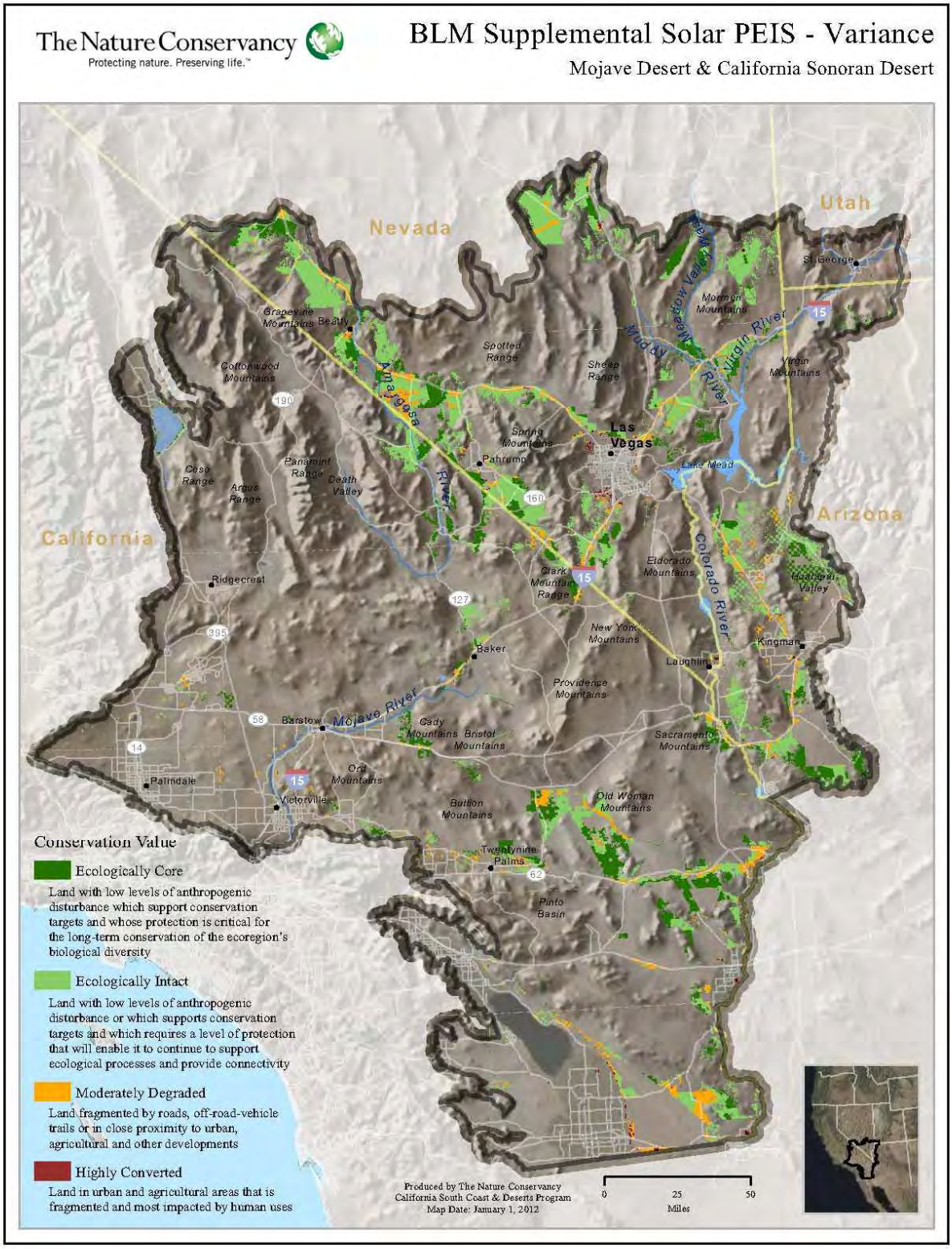
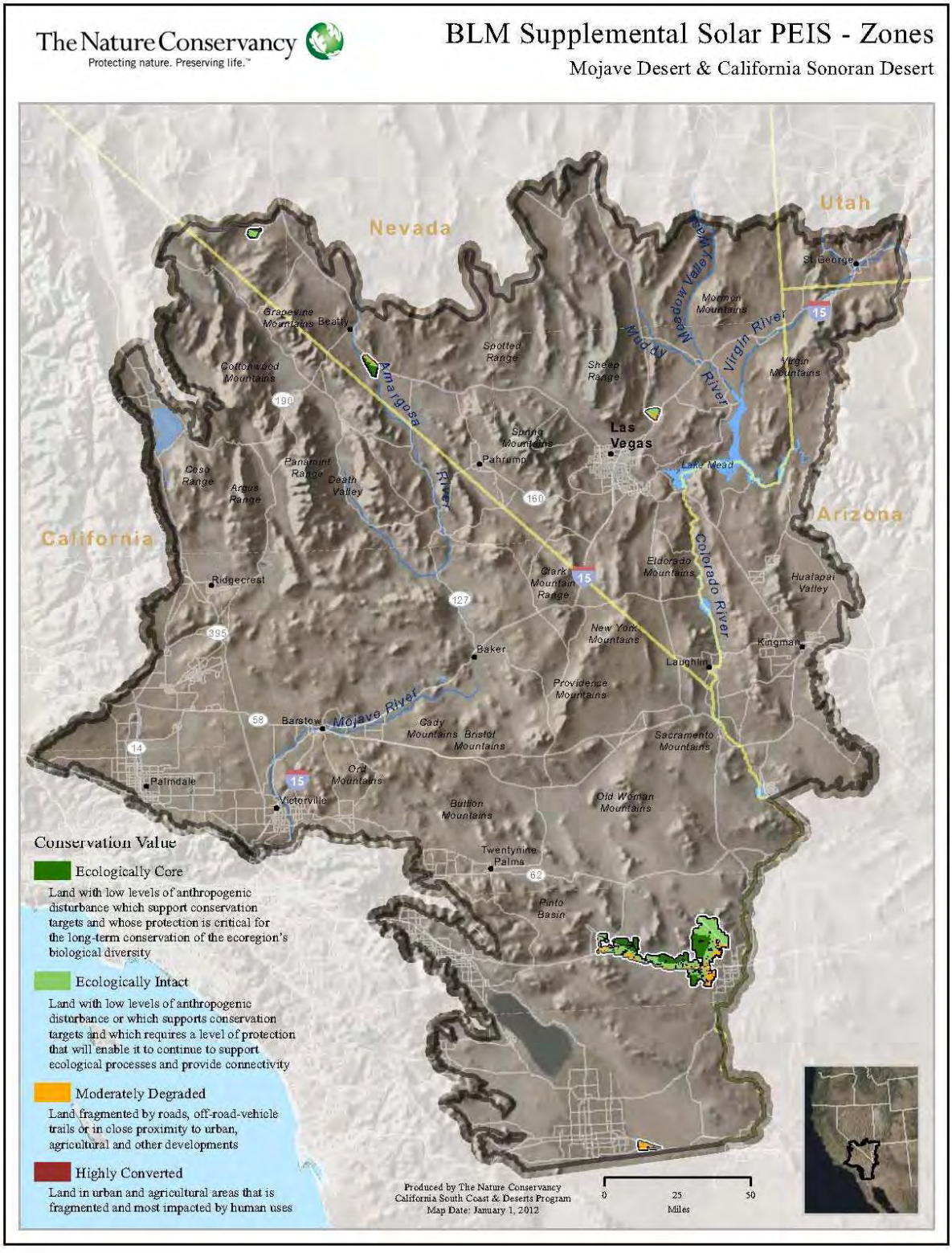


Figure 4. Land Conservation Value: SEZ Alternative



Solar Energy Zone Program Analysis

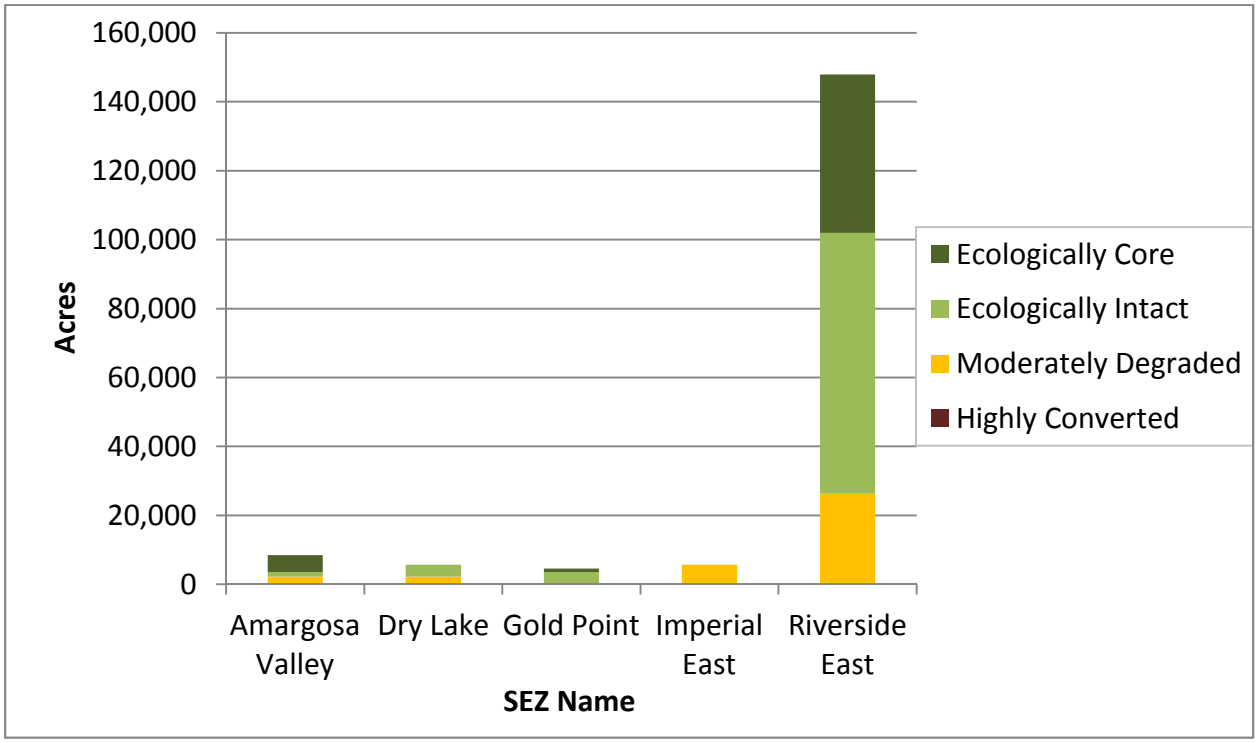
The 17 SEZs proposed in the SDPEIS would encourage grouping of solar energy facilities, reducing fragmentation and the need for new transmission lines relative to the more dispersed siting of facilities likely under the Modified Program Alternative or the No Action Alternative. SEZs also expose far less high conservation value land to ROW application than the other alternatives, and fewer federally listed species and other BLM Special Status Species to potential harm. Nonetheless, several of the proposed SEZs could be modified or replaced with other lower conservation value land to better avoid harmful impacts to biological diversity.

Although the Solar Energy Zone alternative has many advantages over the other alternatives, it still poses unnecessary threats to biological diversity, most of which could be eliminated or reduced by modifying or replacing specific SEZs. For example, 30% of the area of the SEZs proposed for the Mojave Desert Ecoregion and for the California portion of the Sonoran Desert falls on lands that were assigned to the highest conservation value category- Ecologically Core- in the second generation ecoregional assessments: (51,948 acres, 30%; Table 2 below; Figure 1). Large areas of the Amargosa Valley, Dry Lake, Gold Point, and Riverside East SEZs comprise these highest conservation value lands (Table 2).

Table 2. Acres of Land by Conservation Value Category for SEZs in the Mojave Desert Ecoregion and California portion of the Sonoran Desert Ecoregion and Overlap with Portfolio sites

SEZ Name	Ecologically Core	Ecologically Intact	Moderately Degraded	Highly Converted
Amargosa Valley	4,971	1,278	2,230	-
Dry Lake		3,468	2,249	-
Gold Point	1,062	3,535	-	-
Imperial East	-	-	5,622	96
Riverside East	45,915	75,656	25,989	350
Total	51,948	83,937	36,090	446
	(30%)	(49%)	(21%)	(0%)

Figure 5. Proportions of Land in each of the Four Conservation Value Categories for each of the Five Proposed SEZs Located in the Mojave Desert Ecoregion or the California portion of the Sonoran Desert Ecoregion.



Below we recommend that some of the proposed SEZs be replaced or modified to avoid damage to lands with high conservation values and use the following criteria to help identify lands that may be suited to replace these excluded areas or to add SEZs if the need arises:

1. Lands that have been mechanically disturbed, including areas classified as Moderately Degraded and Highly Converted in the Mojave and California Sonoran assessment, i.e. locations that are degraded and disturbed by mechanical disturbance, including areas that have been "type-converted" from native vegetation through repeated wildfires, plowing, bulldozing or other mechanical impact often in support of agriculture or other land cover change activities (mining, clearance for development, heavy off-road vehicle use)
2. BLM lands of comparatively low resource value located adjacent to disturbed and degraded private lands to allow for the expansion of renewable energy development onto private lands, with private lands development offering tax benefits to local government

3. Brownfields to revitalize idle or underutilized industrialized sites; existing transmission capacity and infrastructure are typically in place
4. Locations adjacent to urbanized areas that provide jobs for local residents often in underserved communities; minimize growth-inducing impacts; provide homes and services for the workforce that will be required at new energy facilities; and minimize workforce commute and associated greenhouse gas emissions
5. Locations that minimize the need to build new roads
6. Locations that could be served by existing substations
7. Areas proximate to sources of municipal wastewater for use in cleaning
8. Locations proximate to load centers
9. Locations adjacent to federally designated corridors with existing major transmission lines.

We also recommend that greater emphasis be placed on providing incentives for renewable energy development on disturbed private lands. In the Mojave Desert, BLM and other federal agencies land holdings are largely undisturbed and of high conservation value with nearly 5.5 million acres in Ecologically Core and Ecologically Intact status versus just 428,245 acres of Moderately Degraded and Highly Converted land (Table 3).

On the other hand, private lands in the Mojave are disproportionately disturbed and of lower conservation value with over 1 million acres of Moderately Degraded and Highly Converted land, more than double the acreage of lower conservation value lands held by BLM. This is particularly noteworthy because less than 15% of the land in the Mojave is in private hands, a lower percentage than any other U.S. ecoregion. Large areas of privately held, disturbed lands most suitable for renewable energy development are likely to be found in other ecoregions as well.

Table 3. Proportional Ownership of Land in Each Conservation Category

Category	BLM	NPS	DOD	USFWS	USFS	State	Tribal	Private	Other
Core	44.8%	27.4%	11.0%	2.5%	2.5%	2.2%	0.3%	8.1%	1.3%
Intact	52.7%	19.1%	11.9%	3.4%	0.2%	1.8%	0.4%	8.3%	2.1%
Degraded	29.1%	2.1%	17.0%	0.1%	0.5%	1.9%	0.7%	46.5%	2.1%
Converte	6.4%	0.3%	4.1%	0.1%	0.4	1.7%	1.4%	84.8%	0.9%

d					%				
Core & Intact	49.3 %	22.7 %	11.5 %	3.0%	1.2 %	2.0%	0.4%	8.2%	1.7%
Degraded & Converted	23.1 %	1.6%	13.6 %	0.1%	0.4 %	1.8%	0.9%	56.7%	1.8% [1]
[1]Rows total 100%									

SEZs in California and Nevada

The Nature Conservancy closely examined each of the proposed Solar Energy Zones in California and Nevada. More than half of the total area of the proposed SEZs is in California, where four SEZs have been proposed, including the largest: the Riverside East site (159,457 acres). We recommend that Ecologically Core and Ecologically Intact lands be eliminated from all the proposed SEZs that contain them. Below we offer specific comments on proposed SEZs with recommendations for excluding specific areas of high conservation value.

SEZs Removed from Consideration in the SDPEIS

The Iron Mountain and Pisgah SEZs were removed from consideration in the SDPEIS. The Nature Conservancy agrees with this action, as solar development in either of these locations could have significant ecological impacts. The Iron Mountain SEZ contained nearly four-fifths Ecologically Core land, with little more than one-fifth classified as ecologically intact or moderately degraded. Bighorn sheep have been reported on the edge of this area, which is also within the top end for habitat suitability in the desert tortoise model. Nearly 80% of the Pisgah SEZ is comprised of Ecologically Core lands. Ecological impacts to these high value conservation lands have been avoided by removing these two SEZs from consideration.

Amargosa Valley

This valley (Figure 6) is already scheduled to be heavily compromised by ongoing existing renewable energy applications, two of which are on the "fast track" course. There has been no explanation why additional facilities are needed in this general area given the scale of the existing proposed facilities. According to the Nature Conservancy's 2010 Ecoregional Assessment for the Mojave Desert, the majority of this SEZ is contained within Ecologically Core zone with an additional 1,278 acres of Ecologically Intact lands. Only one quarter of this SEZ is within Moderately Degraded category, and that principally located along US Highway 95.

This valley is located within an important corridor of movement for desert tortoises in light of projected climate change. Currently occurring at low densities, this very lightly impacted valley of Mojave creosote-bursage scrub may be an important

population center for this enigmatic desert species if climate trends continue.

The Amargosa Valley groundwater basin, which is already over-allocated, is linked to critically important desert oases such as Oasis Valley to the north and Ash Meadows and the Amargosa River Canyon to the south. Recent hydrological investigations have demonstrated that water from the north is important to sustain spring flow along the Amargosa River in California through the Shoshone/Tecopa/Amargosa Canyon region. The Amargosa Area of Critical Environmental Concern and Wild and Scenic River segments in California could be potentially adversely affected by groundwater pumping by proposed solar plants in the Amargosa Valley of Nevada.

Additionally, the presence of Big Dune at the core of the Amargosa Valley should cause serious concerns that the proliferation of renewable energy facilities will interrupt important sand transport pathways from the Amargosa River bed and nearby dry lake beds to the south and east of this valley (Figure 7).

If there is a credible argument to be made for any solar development in this area, let alone additional renewable energy to be generated in this vicinity after the build out of several existing “fast track” solar applications, that development should occur only in the moderately degraded corridor paralleling US 95. We strongly urge that this SEZ should be eliminated from further consideration, and, if not, that any approvals be given only after the highest level of scrutiny and subject to carefully considered mitigation requirements, especially those related to water use.

Figure 6. Amargosa Valley SEZ

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SEZ Initial Assessment

Amargosa Valley Solar Energy Zone

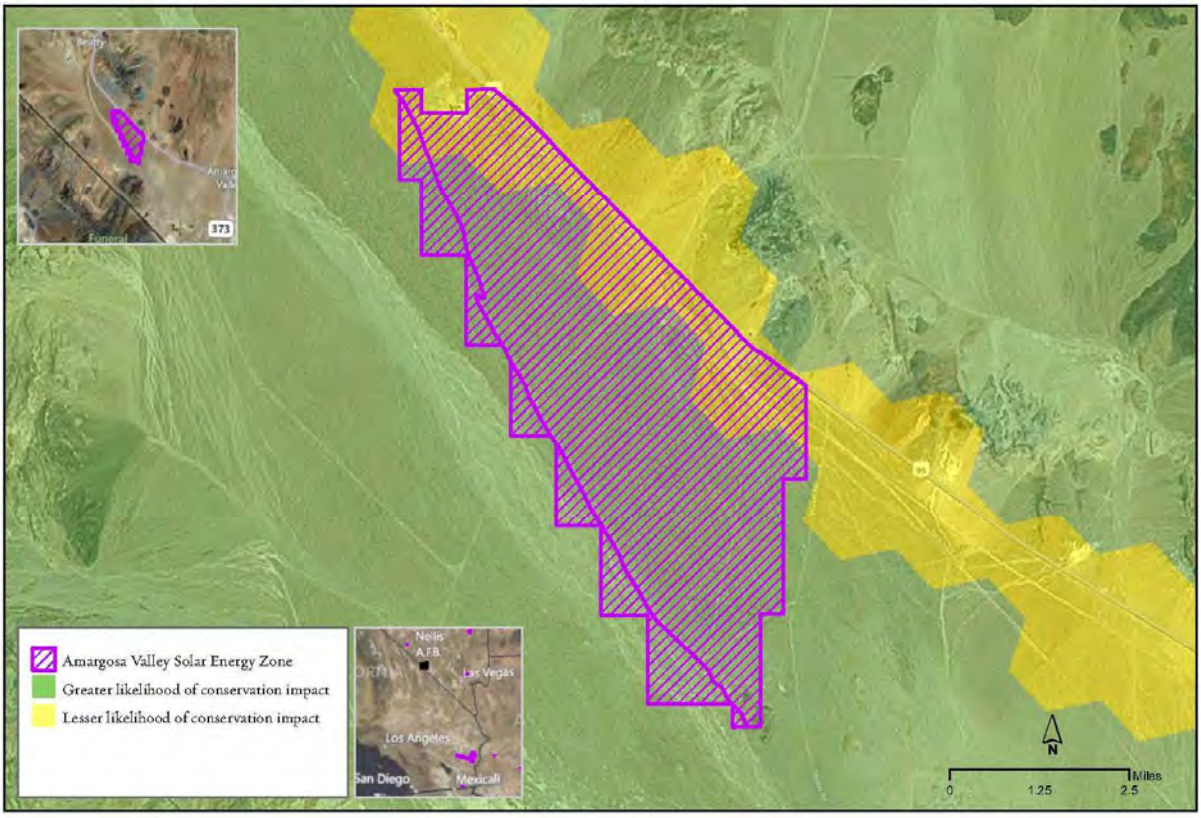
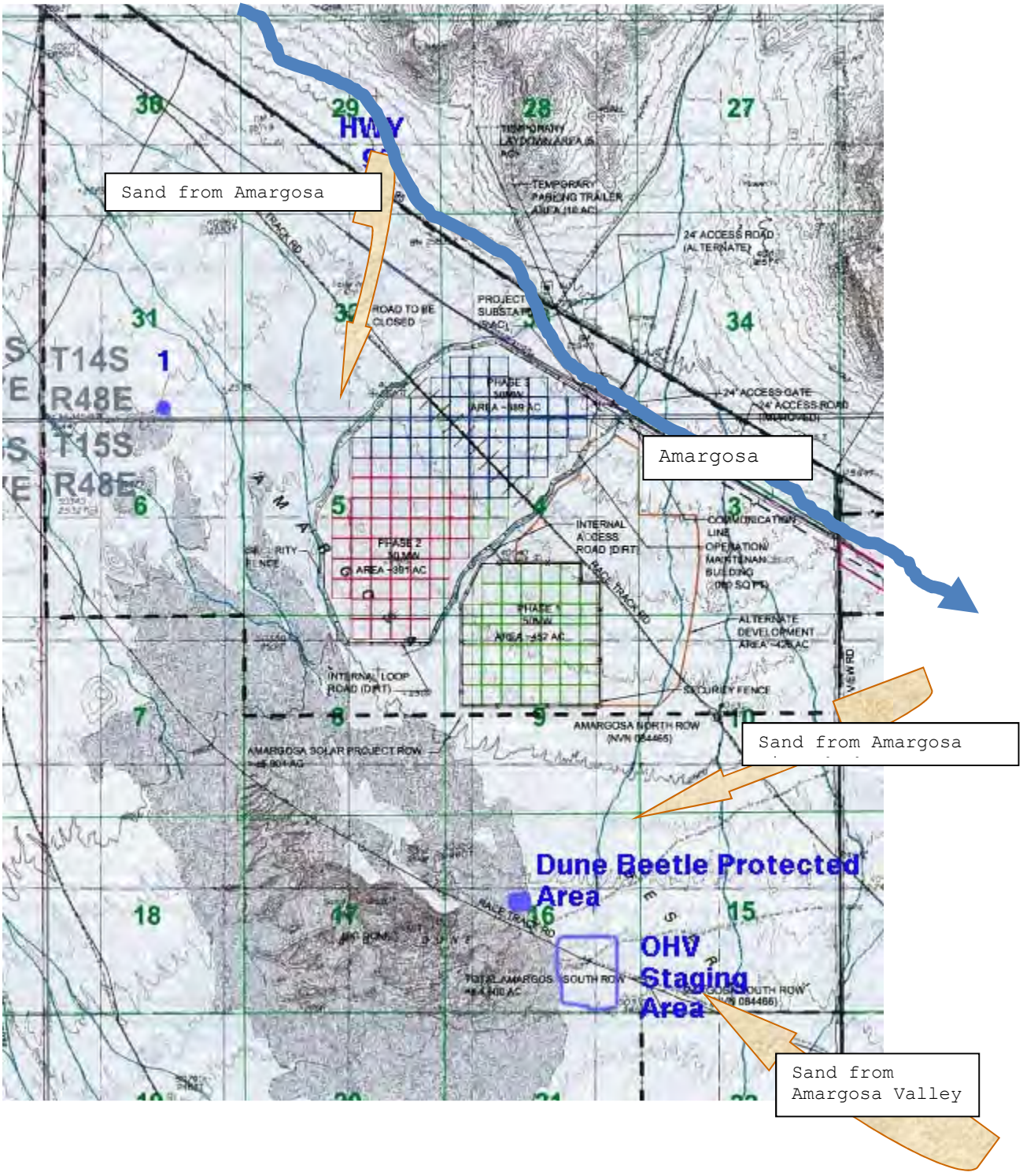


Figure 7. Big Dune in Amargosa Valley with Likely Sand Transport Pathways



Dry Lake

The majority of this proposed SEZ is in ecologically intact acreage. With the exception of important washes that drain into a playa wetland at the northern end, the vegetative communities and species contained within the boundaries of this SEZ are common throughout the Mojave Desert. The SEZ is surrounded by existing renewable energy facility applications that would likely take precedence over any facility to be developed within this SEZ, and as such it is difficult to justify the additional development on washes that are vital to maintaining an ephemeral wetland community. The location is proximate to the likely end user of power generated here (Las Vegas Valley) and is heavily compromised by existing facilities including considerable existing power transmission lines.

This location is generally suitable and appropriate with the exception of the washes leading to the playa wetland at the northern end of the SEZ. This area should be eliminated from the SEZ and the acreage could be replaced with that to the east and south of the Dry Lake on either side of Interstate Highway 15.

Figure 8. Dry Lake SEZ

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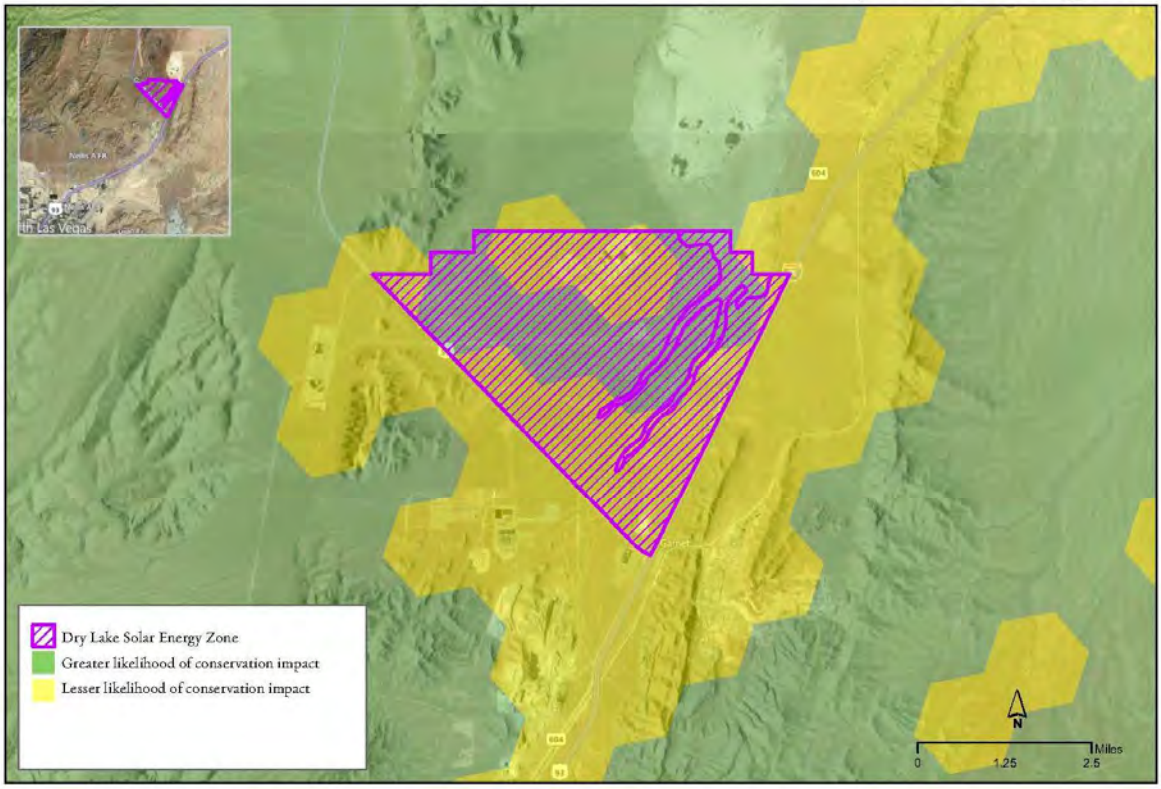
SEZ Initial Assessment

Dry Lake Solar Energy Zone



Gold Point

Gold Point SEZ is entirely within both ecologically core and intact zones identified by the Nature Conservancy in its 2010 Mojave Desert Ecoregional Assessment. It is quite distant from both existing transmission lines, as well as from likely significant end users in Las Vegas Valley or Tonopah. The immediate vicinity is remote and largely intact from existing developments and should remain so.

The general vicinity serves as habitat for several locally important species as identified in the PEIS such as Pronghorn antelope and Greater Sage Grouse. The proposed transmission corridor is particularly problematic for both of these species.

This SEZ is remote and not regionally significant as far as demonstrated power needs and furthermore is currently ecologically intact. It should be removed from consideration or relocated to nearby degraded or converted lands. Moving the SEZ could also alleviate transmission corridor concerns since the new corridor could parallel US 95 without appreciable additional impacts to the Pronghorn antelope and Greater Sage Grouse.

Figure 9. Gold Point SEZ

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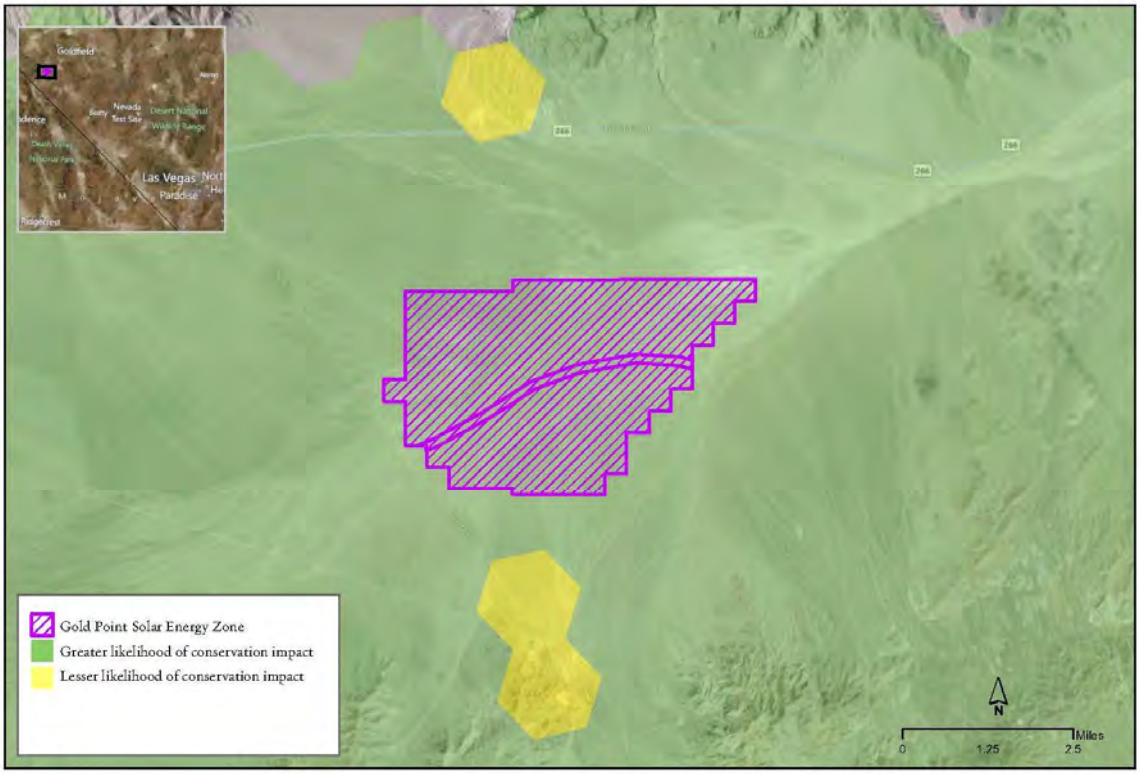
SEZ Initial Assessment

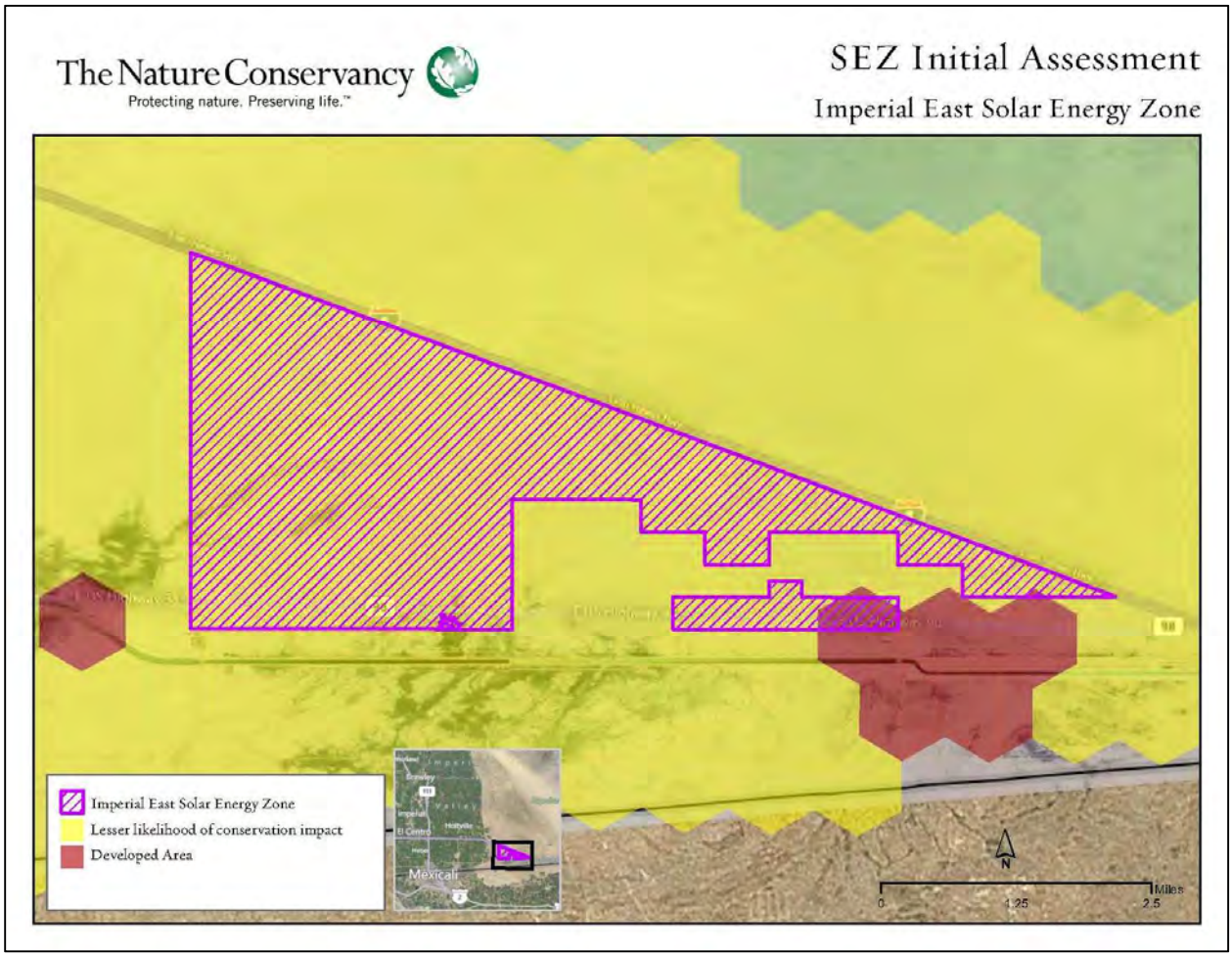
Gold Point Solar Energy Zone



Imperial East

The Imperial East SEZ is comprised entirely of lands that have been designated as having lower conservation value by the 2009 Framework for Effective Conservation Management of the Sonoran Desert in California. Despite this designation, in-depth local surveys and are required to determine if developments proposed within this area would have significant impacts on conservation targets or ecological processes. Even lands that have relatively low conservation value may harbor important biodiversity elements.

Figure 10. Imperial East SEZ



Riverside East

The Riverside East SEZ is divided between Moderately Degraded, Ecologically Intact and Ecologically Core lands. Over 31% of the Riverside East SEZ is comprised of lands identified as having high conservation value in the 2009 Framework for Effective Conservation Management of the Sonoran Desert in California because they are un-fragmented and host important species and communities. We recommend the withdrawal from this SEZ of the highest conservation value lands shown on the accompanying map. Areas that should be withdrawn from this SEZ include lands around Palen Dry Lake in the northwestern portion of the SEZ, and the high value habitat northwest of Blythe. In addition, the large size and long, thin shape of this SEZ may hinder the north-south movement of Bighorn Sheep and other wide-ranging terrestrial vertebrate species. The shape of the SEZ should be modified to incorporate viable wildlife linkages and provide connectivity for hydrological and ecological processes such as sand movement in this region.

Figure 11. Riverside East SEZ

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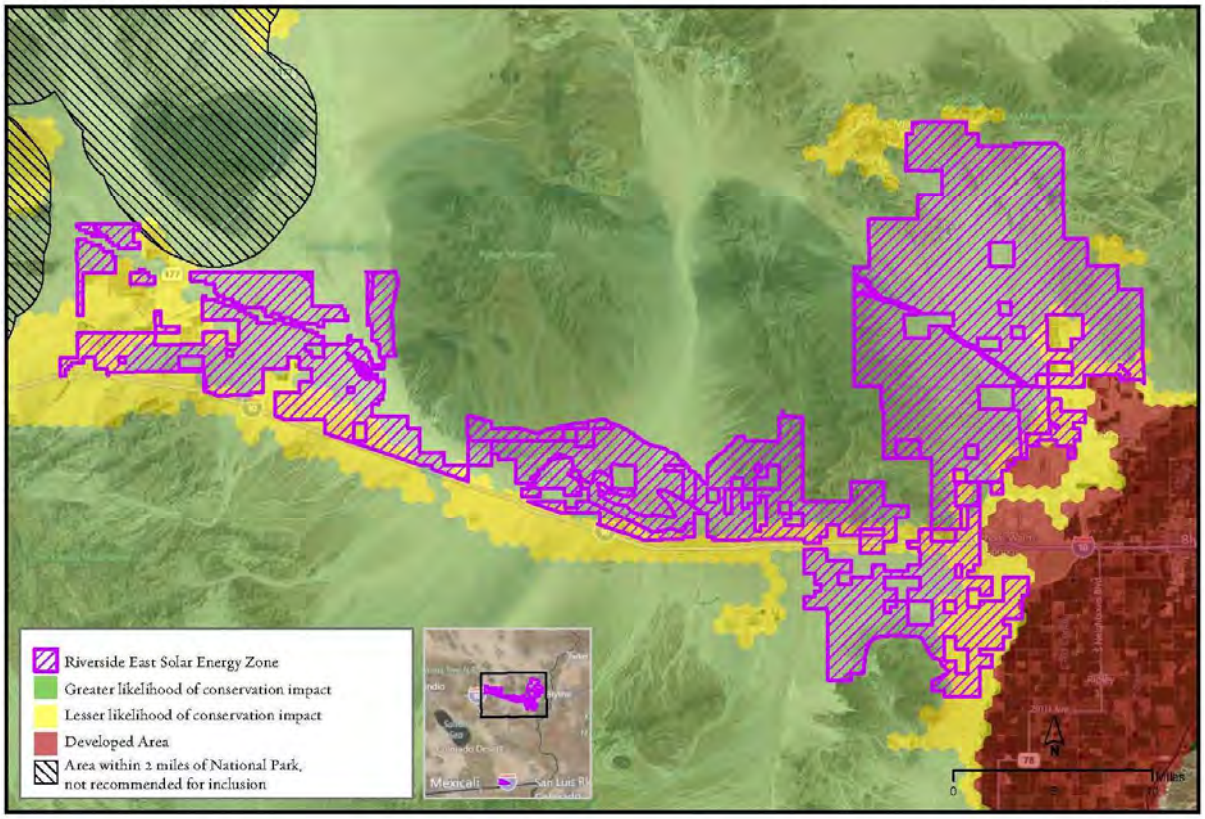
SEZ Initial Assessment

Riverside East Solar Energy Zone



Pending Solar Applications in California and Nevada

The list of 79 pending applications for ROW authorizations for solar facilities received by BLM as of August 15, 2011 includes 20 applications in California covering a total of 129,092 acres, and 25 applications in Nevada covering a total of 111,397 acres. The spatial data for these applications that are currently available from BLM do not include all projects listed in Appendix A of the SDPEIS. We were unable to attain data for four projects in California and 10 projects in Nevada. The table below details which applications we were unable to analyze due to lack of data (Table 4).

Table 4. Pending Applications for ROW Authorizations Not Included in The Nature Conservancy's Analysis Due to Lack of Spatial Data

Applicant Name (Project Name and/or Geographic Area)	Serial Number	Acres
San Diego Gas and Electric Co (Ocotillo Solar)	CACA 051625	115
Element Power (GrEXt Valley-Atwell)	CACA 051812	1,509
Ridgeline Energy (South Kern Solar)	CACA 052471	160
Ridgeline Energy (Tiwsselman Solar)	CACA 052473	80
Navy Faceng Cmnd SW (Fallon NAS Solar)	NVN 084654	37
Solar Reserve LLC (Pahroc Solar)	NVN 086350	7,680
Silver State Solar LLC	NVN 089530	5,651
Gasna 39 LLC	NVN 089530	600
Lone Valley LLC	NVN 089566	233
Element Power	NVN 089655	2,560
Element Power	NVN 089656	640
Element Power	NVN 089657	640
Element Power	NVN 089658	640
Element Power	NVN 089659	1,280

Total Area Not Included in Analysis	21,825

Despite this lack of data, the Nature Conservancy has been able to analyze the remaining ROW applications (16 in California and 15 in Nevada) to determine which projects would be located on lands that have been identified as having high conservation value. Pursuit of solar development in these locations is likely to be time-consuming and difficult to mitigate, as the presence of important elements of biodiversity, including listed species, is likely to create significant ecological impacts.

In California, six of the ROW applications have more than 50% of their total area on lands identified as Ecologically Core by the Nature Conservancy (Table 5). These include: First Solar – Stateline (CACA 048669) at 97%, EnXCo Inc. –McCoy (CACA 049490) at 93%, NextEra Energy –McCoy (CACA 048728) at 91%, Leopold Company LLC –Ward Valley (CACA 049002) at 84%, Power Partners Southwest (EnXCo) –Troy Lake Solar (CACA 049585) at 69%, and Caithness Soda Mountain LLC (CACA 049584) at 53%. In Nevada, there are three ROW applications with more than 50% of their total area on lands identified as Ecologically Core by the Nature Conservancy. These include GA-SNC Solar LLC (NVN 088552) at 100%, Ausra NV I LLC –Spector Range (NVN 086249) at 88%, and Bright Source Energy Solar Partners –Mormon Mesa (NVN 083914) at 64%. In total, over 76,863 acres identified as Ecologically Core by the Nature Conservancy in the Mojave Desert and the California Sonoran Desert are covered by ROW applications for solar development. An additional 117,824 acres are identified as Ecologically Intact.

Some of the ROW authorizations for solar facilities received by BLM are located in areas close to or overlapping with SEZs that have been eliminated from consideration in the SDPEIS. Examples include Caithness Soda Mountain LLC (CACA 049584), which overlaps with the eliminated Pisgah SEZ and Leopold Company LLC –Ward Valley (CACA 049002), which overlaps with the Iron Mountain SEZ. The Nature Conservancy recommends that the ecological concerns used to refine and eliminate these and other SEZs be brought to bear in assessing individual ROW applications. Individual projects located in areas where SEZs have been removed should not move forward.

In addition, it must be noted that there currently several approved solar projects such as Calico Solar, LLC (CACA 049537), the Blythe Solar Power Project (CACA 048811), and the Ivanpah Solar Electric Generating System (CACA 048668) that are not listed in Appendix A of the SDPEIS. A significant percentage of

the land covered by each of these projects has been identified as Ecologically Core and/or Ecologically Intact by the Nature Conservancy. An accurate assessment of the cumulative impacts of solar development in the southwest U.S. must include these previously-approved projects.

Table 5. Conservation Value of Lands with Pending Applications for ROW Authorizations

Applicant Name (Project Name and/or Geographic Area)	Serial #	Ecologically Core Acres (%)	Ecologically Intact Acres (%)	Moderately Degraded Acres (%)	Highly Converted Acres (%)	Total Acres*
Leopold Company LLC - Ward Valley	CACA 049002	29,680 (86%)	5,573 (16%)	214 (1%)		35,467
EnXco Inc. - McCoy	CACA 049490	11,906 (93%)	930 (7%)	-	-	12,836
Bright Source Energy Solar Ptnr -Mormon Mesa	NVN 083914	8,544 (64%)	4,756 (36%)	-	-	13,300
First Solar - Stateline/Ivanpah	CACA 048669	5,893 (96%)	-	165 (3%)	49 (1%)	6,107
NextEra Energy -McCoy	CACA 048728	4,938 (91%)	502 (9%)	-	-	5,440
Cogentrix Solar Services LLC -McCollough Pass	NVN 083129	4,785 (27%)	12,987 (73%)	-	-	17,772
Caithness Soda Mountain, LLC	CACA 049584	4,206 (53%)	930 (12%)	2,859 (36%)	-	7,995
Power Partners SW -EnXco Troy Lake Solar	CACA 049585	2,557 (69%)	179 (5%)	973 (26%)	-	3,709
Ausra NV I LLC -Spector Range	NVN 086249	2,056 (88%)	271 (12%)	-	-	2,327
Pacific Solar Inv. Inc.- Iberdrola Amargosa No.	NVN 084465	569 (45%)	85 (7%)	602 (48%)	-	1,256
Solar Millennium/Chevron -Palen	CACA 048810	496 (10%)	2,089 (40%)	2,628 (50%)	-	5,213
Ewindfarm Inc -Johnnie Pahrump	NVN 085201	333 (4%)	8,216 (91%)	443 (5%)	-	8,992
Johnson Valley SEGS, LLC - Johnson Valley	CACA 052796	131 (77%)	1,631 (17%)	353 (17%)	-	2,115
EnXco Inc. - Mule Mountain	CACA 049488	39 (2%)	1,929 (94%)	90 (4%)	-	2,058
First Solar -Silver State South	NVN 085801	25 (2%)	1,138 (77%)	310 (21%)	-	1,473
Bright Source Energy Solar Partners	NVN 084631	-	28,170 (85%)	4,867 (15%)	-	33,037
DPT Broadwell Lake - Broadwell SEGS	CACA 048875	-	12,309 (100%)	-	-	12,309
Pacific Solar Investments Inc. Iberdrola -Ogilby	CACA 049615	-	9,062 (>99%)	10 (<1%)	-	9,072

Amargosa Flats Energy LLC - Crystal/Johnnie	NVN 084704	-	6,893 (100%)		-	6,893
First Solar -Desert Spring	NVN 084232	-	5,520 (100%)	-	-	5,520
Chuckwalla Solar 1 LLC -Chuckwalla	CACA 048808	-	3,538 (86%)	560 (14%)	-	4,098
Abengoa Solar Inc -Lathrop Wells Solar	NVN 086571	-	3,143 (82%)	693 (18%)	-	3,836
Power Partners Southwest LLC EnXco	NVN 086158	-	3,072 (100%)	-	-	3,072
First Solar - Desert Quartzite	CACA 049397	-	2,491 (34%)	4,803 (66%)	-	7,294
EnXco Inc. - Desert Harvest Solar	CACA 049491	-	1,189 (99%)	9 (1%)	-	1,198
Nevada Power Company -Dry Lake Valley	NVN 084052	-	600 (97%)	17 (3%)	-	617
Ausra NV I LLC -Highway 160	NVN 086248		514 (62%)	314 (38%)	-	828
Sunpeak Solar LLC - Superstition Solar I	CACA 049150	-	29 (1%)	4,829 (88%)	605 (11%)	5,463
Solar Reserve LLC -Solar Reserve/Imperial Co.	CACA 049884	-	-	3,830 (100%)	-	3,830
Power Partners Southwest LLC EnXco	NVN 086159	-	-	680 (100%)	-	680
Total Acreage:		76,863	117,824	29,250	654	224,592

*Spatial data available for this analysis predates the release of the SDPEIS. In many cases, the total acreages of ROW applications have changed over time.

Potential Changes to Figures:

- Figure 2: This map may need to be modified due to different rules for the No Action alternative between the original PEIS and the Supplement to the PEIS. Changes have been made to accommodate updates in GIS data for National Monument boundaries.
- Figure 3: We need to standardize what we call this alternative. Within the Supplement to the PEIS it is called the "Modified Program". The text of this document also calls this alternative the "Modified Program Alternative". The figure should reflect this change.
- Figures 6, 8-11: The title of these figures is "SEZ Initial Assessment". This language is open to revision.

Figures 6, 8-11: The legend presents lands that are identified as Ecologically Core or Ecologically Intact as having a "Greater likelihood of conservation impact" and those identified as Moderately Degraded as having a "Lesser likelihood of conservation impact". This language is open to re

Thank you for your comment, Christine Canaly.

The comment tracking number that has been assigned to your comment is SEDDsupp20190.

Comment Date: January 28, 2012 01:56:10AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20190

First Name: Christine
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Attachment: 01.26.12.F.Draft_Solar_Transmission_Alternatives WMB Edits 060710.pdf

Comment Submitted:

Attachemnt to previous comments

January 14, 2012

(update from June 7, 2010)

SLV Solar/Transmission line Alternatives and Redundancy recommendations compiled by:

The San Luis Valley Solar/Transmission Work Group in cooperation with the San Luis Valley Ecosystem Council and Citizens for San Luis Valley Water Protection Coalition

Transition of **energy infrastructure** is occurring rapidly in all sectors of our society and renewable**, clean** energy transmission and development has to be at the top of the list. The San Luis Valley **(SLV)**, located in south central Colorado**,** is receiving national attention because this unique area, exemplifies the debate on how to move forward.

The SLV Solar/Tran work group, composed of citizens throughout the valley, has met monthly for a year to determine what will work for local communities to move forward towards energy independence that includes: autonomy, efficiency, reliability, security and redundancy and at the same time, protects the stability, including cost, of our agricultural industry and existing utility infrastructure. There are currently two utility providers operating in the SLV, **Xcel Energy of Minneapolis, MN** and SLV Rural Electric Cooperative (SLVREC), a **member of Tri-State Generation and Transmission Association, Inc. of Westminster, CO.**

Various options are included in these recommendations because public policy direction and advances in technology are **keys** to determining optimal approaches for future decision making.

We believe the San Luis Valley can be a model for Colorado and the nation regarding development of an autonomous, locally generated power and energy grid that can support redundancy and also provide export of power for the larger energy utility infrastructure.

Baseline Mapping Tool- The Solar/Tran Working Group developed a **comprehensive map** which includes land management classifications, existing electric utility infrastructure, solar radiant potential **(insolation),** current land uses, sensitive species **areas including** wetlands & riparian **areas on both** public and private land. It is critical policy makers and utilities refer back to this baseline map when making **siting** and design decisions.

<u>We bring the following recommendations:</u>

1. We support a Local Power Authority (LPA) within the six SLV counties to remain autonomous and work in cooperation with utilities to oversee design, integration, and fair rate structure development of locally generated power.
2. We support beginning with the upgrade of existing transmission lines into the SLV and implementing micro grid **(Smart Grid)** technologies to the 31 substations within the SLV **existing as of the date of this document.** We understand that the Poncha Pass substation must be included in this upgrade. **(Please refer to baseline map.)**
3. We support a Distributive Generation (DG) model that is supported by financial incentives, in combination with various forms of **solar power facility siting and siting of other clean energy facilities such as hydro, wind, geothermal, and small (5 MW) biomass. Such facilities may range** in scale from individual landowner solar irrigation to larger **5 MW to 40 MW PV solar or other clean energy installations** near the 31 existing substations, including solar gardens. **We will research and specify acceptable MW range for each substation.**
4. We support locally generated renewable**, clean** energy power supply (**e.g.,** solar, **hydro and other technologies** that is well-designed and brings the capacity for storage **and economical distribution** to ensure local redundancy and reliability.

5. We support prudent development of solar energy on private or municipal lands **provided the facility is appropriately sited.** Please refer to Baseline map **and our siting recommendations.**
6. We support a **phased approach** to the **siting** of large scale solar **and other clean energy** facilities and upgrading/development of future transmission lines.
7. We also support, with scrutiny,120 MW Solar facilities in each of the 5 counties (We are not including Mineral County here) cited for maximum solar radiation potential using baseline mapping tool **or** one- 250 MW (**estimated** 2 sq mile area) **Concentrating Solar Thermal-electric power facility with integrated storage** located near the SLV sub-station. We understand that technological advances may make this a moot recommendation.
8. We support a **maximum** of 800 MW, (double circuit 230kv line) total generation cap, 150 produced for local use and 650 exportable through upgraded transmission line over Poncha Pass to be exported out of the San Luis Valley. This is four times the current rate of Maximum Peak Load used in the SLV. Concerns were raised that **power export in excess of 650 MW currently** would threaten the character, natural resources and current land use of this unique area. **This recommendation is consistent with a phased approached to clean energy development wherein technological advances in clean energy production and storage potentially could allow greater power exports, or alternatively lessen demands on SLV power exports.**
9. We support one 250 MW **Concentrating Solar Thermal-electric power facility (as mentioned above) with integrated storage sited near the San Luis Valley Substation southeast of Center, CO** that would meet stringent requirements and be suitable for this area. For example, water use, both quality and quantity, impacts to flyway populations (birds and bats), night sky alterations **and other potential impacts** must be researched and approved through the LPA.
10. We support the research and development of Concentrated Solar Facilities in Zone 5, near Pueblo and Walsenburg, where large scale substations such as Comanche already exist and are closer to point of use **and other major existing power transmission corridors.** (Front range Metro area **and High Plains Express Transmission Corridor, for example.**)
11. We are also adopting BLM mitigations regarding their research into the Solar Energy zones for the San Luis Valley. We believe these mitigations should be applied to the entire San Luis Valley. These mitigations include: No power towers, No water cooled facilities and proper reclamation**.**

Qualifications

We will continue to research the costs/investments involved in our recommendations. The economics of energy production in all its forms is changing rapidly and dramatically throughout the world. Our access to energy economics expertise is substantial, and we will provide all reference information necessary to support the economic viability of our recommendations.

We will continue to research the rapidly evolving technology of solar and other clean energy, particularly as it relates to storage, DG, Smart Grid, business models and other modern energy solutions. We will provide sound reasoning and projections for the technological evolution of clean energy solutions during the next decade. The rapid changes in clean energy technology further emphasize our recommendation for a phased approach to energy development that does not lock us into technology or energy and transmission planning scenarios that could rapidly become obsolete.

In coming months, the Solar/Tran work group will be providing far greater detail to these recommendations. Thanks for your patience as we continue to research and learn about the possibilities and limitations of our existing infrastructure. If you would like to join us, or if you have information and recommendations you would like to share, please contact us.

Thank you for your comment, Barbara Renton.

The comment tracking number that has been assigned to your comment is SEDDsupp20191.

Comment Date: January 28, 2012 19:54:45PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20191

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Attachment:

Comment Submitted:

Please extend the time necessary for we, the shareholders to READ this 500+ page document and investigate the proposed sites.

I would have no problems with solar compared to wind turbines since solar is much better. But ROOFTOP solar is much more preferred since of the millions of homes and buildings in our state, our roofs would be a preferred site!

Thank you.

Thank you for your comment, Michael Mantell.

The comment tracking number that has been assigned to your comment is SEDDsupp20177.

Comment Date: January 27, 2012 20:41:37PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20177

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Attachment: Joint Comments on the Supplement to the Draft Solar PEIS.pdf

Comment Submitted:

Abengoa Solar Inc. •Amonix, Inc. • Audubon California • BrightSource Energy, Inc.
Center for Energy Efficiency and Renewable Technologies • Defenders of Wildlife
enXco – an EDF Energies Nouvelles Company • First Solar, Inc. • Iberdrola Renewables, Inc.
Large-scale Solar Association • Natural Resources Defense Council • NRG Solar LLC
Pacific Gas and Electric Company • Solar Energy Industries Association • SolarReserve, LLC
Southern California Edison • SunPower Corporation, Systems • The Nature Conservancy
The Vote Solar Initiative • The Wilderness Society • Torresol Energy

January 27, 2012

The Honorable Ken Salazar
Secretary of the Department of the Interior
1849 C Street SW
Washington, DC 20240

Re: Joint Comments on Supplemental Draft PEIS for Solar Development

Dear Secretary Salazar:

The signatories to this letter are a group of conservation, utility and solar developer stakeholders who have spent hundreds of hours of time in thinking, writing, and talking about the issues that are central to the Supplement to the Draft PEIS for Solar Energy Development in Six Southwestern States ("PEIS"). This letter states the agreements we have reached with regard to various issues presented in that document. Individual and groups of stakeholders will send their own comments on issues that we have either not addressed as a group or were unable to reach agreement on at this time.

The parties generally agree that (1) solar energy development in the right places on public lands is necessary to achieve our renewable energy goals; protect desert ecosystems, landscapes and species; and fight rapid climate change; and (2) zones are an accepted land use planning tool that can facilitate solar development, especially by clustering projects around transmission, minimizing other infrastructure needs and reducing the footprint of that development.

We further agree the zones proposed thus far are only a starting point in the process and we are recommending initiation of the next steps necessary to create a more robust system of zones. Those steps will ensure the identification of new zones which are adequate in size and location to which transmission can be built and in which clustered large-scale solar development can occur.

We agree that the current PEIS moves us closer to the model described above, and represents an unprecedented effort by the Department of the Interior and Bureau of Land Management, in cooperation with the Department of Energy, to use public lands strategically to produce clean energy. In recognition of these facts, we have come together to develop recommendations to assure that the BLM ROW application process remains flexible to accommodate "smart from the start" near-term development as well as to promote the prompt identification and designation of new zones in accordance with the framework addressed in the PEIS, as modified by these comments. The parties further agree that BLM must complete the Solar PEIS by the end of fiscal year 2012.

RECOMMENDATIONS

1. Pending Applications

We agree that BLM should scrutinize pending applications to assure that they meet financial and technical qualifications and are proceeding with due diligence. BLM's recent actions to assure

qualifications and due diligence in California resulted in fewer pending applications. We urge a similar process in Arizona and Nevada.

We agree that the pending applications identified in Appendix A should be processed under current rules, not new rules under the Supplemental Draft PEIS (see box on page 1-9).[1] In addition, the solar industry has identified applications that appear to be pending but are not on the list.[2] These applications should also be processed under current rules, provided that BLM confirms the filing dates for these applications and that it did not deliberately exclude one or more of these applications from Appendix A for failure to comply with diligence or other requirements.

In addition, the reference to denying pending applications because of their location in proposed exclusion areas (page 1-11) should be removed.[3] We urge BLM not to change the deadline for these applications again.

2. Variance Process

We agree that the variance process is intended to be the exception, not the rule, consistent with the framework proposed in the Supplement. We are committed to working together to develop new zones so that use of the variance process can be minimized. Until then, the variance process requires some modification. For example, the Supplement articulates a set of variance factors, and states that they will be considerations in processing variance applications. However, we agree that the first variance factor (demonstration of technical and financial capabilities) should be enforced as a requirement, consistent with existing Instruction Memoranda. As further stated below, we also agree that there should be a requirement regarding Desert Tortoise. We do not yet agree on a recommendation for the contents of a Desert Tortoise requirement, except to say that neither Option 1 nor Option 2 is adequate.

a. Low resource value factor

The variance factor that takes into account "Low resource values and minimal conflict with adjacent lands" (page 2-35, line 8) should be replaced by the following language:

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[1] All page references are to the Supplement to the Draft PEIS.

[2] These applications are the following:

1. Siberia (CACA-049421) filed under Solar Partners V, LLC. Received by BLM 4-27-07. 13,920 acres.
2. Palo Verde II, aka Sonoran West (CACA-051967) filed under BrightSource Energy. Received by BLM 5-12-09. 12,269 acres.
3. Pahrump Valley, aka Sandy Valley (NVN-090476) filed under BrightSource Energy. Received by BLM 1-21-11. 15,190 acres.
4. Rio Mesa Solar (CACA-053138) filed under BrightSource Energy. Received by BLM 2-14-11. 3,054 acres.
5. Mule Mountain III (CACA-50390) filed by SolarReserve on 8-22-08 (second in line application); SolarReserve notified of status as a first in-line application on 5-16-2011. 8,160 acres.
6. Sandy Valley III (NVN-[# TBD]) filed by Sandy Valley Solar III, LLC. Received by BLM 10-21-11. 10,804 acres.
7. NextEra Sandy Valley (NVN-[# TBD]) filed under Boulevard Associates. Accepted by BLM 10-21-11. 3,200 acres.

[3] Pending applications in proposed exclusion areas may qualify as high conflict projects under either Instruction Memorandum 2011-061 (February 7, 2011) or the recommendations dated December 22, 2010 that were previously submitted by some of the signatories to this letter.

Documentation that the proposed project is in an area with low or comparatively low resource conflicts. Examples of such lands and others where development could present comparatively low conflicts if conflicts can be resolved include the following:

- Lands specifically identified for solar or wind energy development in BLM land use plans;
- Previously disturbed sites or areas adjacent to previously disturbed or developed sites;
- Locations that minimize construction of new roads and/or transmission lines;
- Lands adjacent to designated transmission corridors;
- Lands that are not excluded due to their visual resource classification, subject to review and additional mitigation where required;
- Lands identified as suitable for disposal in BLM land use plans;
- Areas repeatedly burned and invaded by fire-promoting non-native grasses, at least in the Sonoran and Mojave deserts;
- Department of Defense operating areas, including areas with significant radar, airspace, or land use conflicts, where conflicts can be resolved;
- Areas where project development may adversely affect lands acquired for conservation purposes, where conflicts can be resolved;
- Areas with low or relatively low conflict characteristics that are adjacent to private lands that might be used for development; and
- Areas where water extraction does not pose a significant threat to species or systems. However, variance applications where groundwater extraction may impact groundwater dependent ecosystems, and especially within groundwater basins that have been over appropriated by state water resource agencies, may qualify where the developer commits to provide mitigation measures that will provide a net benefit to that groundwater resource.

These examples are intended to reinforce the intent of the variance process – i.e., to allow development on sites with low or comparatively low resource conflicts, without undermining the goal of moving toward zone-based development.[4]

b. Factors with the word "minimize"

The factors pertaining to "minimizing" certain impacts should be replaced with the following language:

Minimize need to build transmission and infrastructure (page 2-37):

> Documentation that the proposed project will minimize the need to build new roads and that it meets one or more of the following transmission sub-criteria: (1) transmission with existing capacity and substations is already available or (2) only incremental transmission

[4] We agree that variance applications could not be sited on lands previously identified as high conflict such as those in Instruction Memorandum 2011-061. The examples of low and comparatively low resource conflicts are adapted from Instruction Memorandum 2011-061. We also agree that the following are not low impact or comparatively low conflict areas: (1) "[l]ands with wilderness characteristics outside Wilderness and Wilderness Study Areas that have been identified in an updated wilderness characteristics inventory" pursuant to Section 201 of the Federal Land Planning and Management Act, 43 U.S.C. §§ 1701, 1711, and Instruction Memorandum 2011-154 (July 25, 2011), not a Visual Resource Inventory; or (2) "[s]ensitive habitat areas, including important eagle use areas, priority sage grouse habitat, riparian areas, or areas of importance for Federal or state sensitive species." *Id.*

is needed, e.g. re-conductoring or network upgrades, and development of substations, or (3) new transmission upgrades or additions to serve the area have been permitted or are planned sufficiently to reasonably be expected to be available in time to serve the generation project.

Minimize impact on water (page 2-37):

Documentation that demonstrates that the proposed project is designed to use the best available technology[5] for limiting water use that is applicable to the specific generation technology as well as during construction and operations, subject to review and additional mitigation.

c. Desert Tortoise

We are in agreement that protection for desert tortoise habitat and populations in the variance process should be a requirement rather than a factor to be considered. However, we also agree that Options 1 and 2 in the Supplemental Draft PEIS are inadequate. At this time, the signatories to this letter have not reached an agreement on a recommendation as to the specific content of a requirement for diverse geographic areas. We intend to continue to work as a group on the development of appropriate recommendations.

3. Use of Height and Technology Limitations in Designated SEZs

We agree that BLM should remove the SEZ height and technology limitations applied to areas described as requiring VRM Class II or III "consistent" mitigation (pages C-58 and C-343, Section C.7.3 and Draft Table A.2.2). These VRM considerations should be dealt with on a case by case basis in the NEPA process.

4. Slope and Insolation Exclusion Criteria

Slope and insolation are technical criteria or constraints. They should be listed separately from other exclusion criteria.

We agree that there could be some flexibility to develop on lands with greater than 5% slope.

a. Slope

With regard to lands with greater than 5% slope, we propose:

- Allow developers to file a ROW application on variance lands that includes some lands with up to 10% slope to avoid or minimize resource conflicts, provided that the upslope area is proximate to the variance lands in the application, not otherwise excluded from development, and does not create any significant new or additional conflict. The identified conflict lands would be excluded from future development.
- Create a pilot program by which BLM will allow developers to file a ROW application on variance lands that includes lands with up to 10% slope to generate additional solar energy, provided that the upslope area is proximate to the variance lands in the application, does not exceed 33% of the acreage of the proposed project, and is not otherwise excluded. The application must address all variance factors. An equal amount of similar or better quality land would be removed from variance lands in the vicinity of the upslope lands. BLM would allow a maximum use of

[5] Use of the term "best available technology" is not intended to import the definition of that term from the Clean Water Act, but is instead used in a generic form.

20,000 acres of lands with greater than 5% slope and up to 10% slope in California, Nevada, and Arizona.

b. Insolation

- The parties have discussed the issue of insolation, and tried to agree upon a pilot project parallel to that on slope. However, the parties could not agree on the parameters of such a pilot project. We hope to continue to work on this issue and make further recommendations.

In all of these cases a land use plan amendment would have to be adopted to permit the slope exception.

5. Areas where future applications for large-scale solar development should be prohibited

We agree that new applications for large-scale solar development in the Ivanpah Valley (CA and NV) and the Pisgah Valley should be prohibited.[6] This prohibition on new applications would not apply to amendments to pending applications, provided that such amendments either (1) do not change the boundaries of the pending ROW application or (2) are related to avoiding resource or land use conflicts, adapting the project to third-party owned infrastructure constraints, or using or designating translocation areas or mitigation lands.

6. Protocol for New SEZ Identification, Including West Mojave SEZ

We agree that the identification and designation of new zones is critical to the enduring success of a zone-based solar energy development framework as is the prompt designation of new zones. In general, in designating a new SEZ, BLM should base its decision on NEPA studies which demonstrate that resource conflicts are low or can be addressed and development prospects are high. SEZs should ideally be large enough to allow for siting flexibility and the development of multiple projects (1 GW or more).[7] They must be in areas with access to roads and a suitable workforce. New zones should be located where it is reasonable to anticipate sufficient transmission to serve the quantity of generation planned for the zone can be made available, considering current transmission planning processes and environmental considerations.

The solar industry and environmentalists have previously urged BLM and DOI both individually and collectively to look for new zones in the West Mojave and other areas of the California Desert and to initiate such efforts prior to completion of the Solar PEIS. We intend to continue to work as a group on the development of further recommendations for the designation and processes to be used for adoption of new zones. At this time, we have agreed upon the following recommendations:

- DOI should commit, in the final PEIS and in the ROD, to making a final decision on the designation of new zones, including a potential new zone in the West Mojave, by the end of 2013. Specifically, in the area being addressed in the DRECP planning area, BLM should commit that new zones will be considered in the DRECP.

[6] Due to the divergent views of the industry and the conservation community on the issue of previously-approved applications, this section of this letter does not address amendments to approved applications in these areas.

[7] We say "ideally" because other than the Riverside East SEZ most or all of the SEZs are too small to accommodate multiple projects. It is possible that SEZs will need to be smaller, but ideally they should be large, so as to facilitate needed transmission.

- DOI and BLM should make this decision-making process their highest priority to ensure that the 2013 deadline is met.
- The Department should actively support and provide strong leadership for planning and related processes currently underway – e.g., DRECP, West Chocolate Mountains and RDEP – to ensure timely zone outcomes as well as consistency between these efforts and national renewable energy programs, policies and implementation.[8]
- In addition to playing a lead role in the identification of new zones in the DRECP, DOI's leadership role in that effort should also encompass transmission planning and permitting.
- The Department should commit to the development of regional mitigation plans for SEZs, including a West Mojave SEZ, if one is designated.
- BLM should encourage developers, utilities and other stakeholders to nominate new zones.

7. SEZ Mitigation Plan Recommendations

We are in agreement that the solar energy program should include the elements of a mitigation program that are transparent, systematic, and based on sound science, require ongoing monitoring, and address clear conservation priorities. Such a program will provide certainty to developers about the requirements and costs of mitigation, and assurances to the conservation community and other stakeholders that conservation priorities can be maintained and preserved in perpetuity. The development of the specifics of this mitigation program must not delay the adoption of the PEIS or review of pending applications. At this time the signatories to this letter have not reached agreement on a recommendation on the specifics of the elements for a mitigation program. We do agree that the mitigation program should follow the mitigation hierarchy of avoid first, then minimize, then restore, then offset. We intend to work as a group on the development of appropriate recommendations.

8. Transmission

We agree that identification of solar energy zones (SEZs) and related transmission network upgrades and additions, through integrated land-use and transmission planning efforts informed by the DRECP, will provide greater certainty, resulting in a more orderly, rational, timely, and cost-effective state and regional transmission planning process.

We agree that coordination of local, state and regional land-use and transmission planning efforts will facilitate cost-effective, environmentally sound planning and permitting for transmission network upgrades and additions and transmission corridors to support SEZs.

We agree that optimizing use of existing transmission and corridors for SEZs, and prioritizing the planning, permitting, and development of new and expanded transmission and corridors for SEZs, is important for both economic and environmental reasons.

We appreciate that BLM submitted on January 20, 2012, a study request to WECC asking TEPPC to perform such analyses for the 17 proposed SEZs. We will support the agency's request at WECC and work with WECC/TEPPC to assure that the studies address the most important cases and critical factors.

We agree that a methodology to identify transmission network upgrades and additions and corridors to support SEZs, and to evaluate the associated costs and environmental impacts, is important. We agree, however, that the methodology utilized in the Transmission Analysis in Appendix D is inadequate and could be misleading.

[8] In making this recommendation, it is not our intention to discourage or have the BLM discourage novel solutions that might emerge from RDEP or any other process.

We offer the following recommendations to improve coordination, integration of land use and transmission planning, and to improve the transmission analysis methodology:

a. Coordination

- For California, enter into a memorandum of agreement (MOA) with CAISO and CPUC to formalize coordination in efforts to provide both the strategic planning and project permitting needs necessary to provide timely transmission network upgrades and additions to support SEZs.
- Coordinate with the CAISO's Transmission Planning Process (TPP) to ensure that transmission upgrades and additions needed to support SEZs are considered for inclusion as "policy driven projects".
- Coordinate with the CPUC Long Term Procurement Process (LTPP), as informed by DRECP, to direct renewable energy development to high resource value, low conflict SEZs.
- Seek similar MOAs with the relevant regulators and transmission planners in the other five states within the PEIS study area that will result in prioritized consideration of transmission network upgrades and additions and transmission corridors to support SEZs.
- Coordinate with the WECC regional transmission planning efforts to ensure consistency and compatibility across the west.

b. Integration

- Prioritize the designation of seamless, contiguous, strategically sized transmission corridors on public and private lands to facilitate transmission network upgrades and additions to safely and reliably support SEZs throughout the west.
- Ensure designated corridors include sufficient right-of-way to support network upgrades and additions, over public and private lands. Designated corridors on public lands should be withheld from other uses by DOI consistent with PEIS planning horizons. Designated corridors on private lands should be held for future use consistent with PEIS planning horizons.
- Work with relevant transmission planning entities to ensure that they identify transmission system upgrades and additions to BLM, including collector substations, network upgrades, downstream upgrades, and related infrastructure sufficient to support renewable energy development in the SEZs and to maintain a reliable and safe electrical system.
- Proximity to existing transmission lines does <u>not</u> guarantee availability. Transmission lines located in proximity to SEZs may not necessarily have sufficient capacity to accommodate the anticipated renewable generation in SEZs.
- Encourage the use of existing roads, transmission rights-of-way, and corridors, wherever possible, consistent with all applicable reliability planning criteria required by the North American Electricity Reliability Corporation (NERC), Western Electricity Coordinating Council (WECC), and the California Independent System Operator (CAISO).
- Work to ensure sufficient transmission will be available at the time that generation is anticipated to be placed on line within the zone, by:
    - Working with relevant transmission planning entities to ensure that they identify transmission upgrades, additions, new or expanded corridors, and related infrastructure in sufficient detail so as to facilitate timely permitting by local, state, and federal entities.
    - Working with relevant permitting authorities to prioritize and expedite interagency permit processing for transmission network upgrades and additions in support of SEZs.

- Near-term priority should be given to transmission network upgrades and additions that may be needed to serve geographic areas that have been identified as potential high solar resource value, low environmental/cultural conflict locations such as the Western Mojave and Chocolate Mountains.
- Establish a policy to extend federal jurisdiction for Section 7 consultation to transmission network upgrades and additions and corridors, on federal and non-federal lands, that serve SEZs.
- Coordinate with state and federal permitting agencies to ensure that mitigation requirements for transmission network upgrades and additions and corridors are appropriate, and not redundant.
- Consider incentives to direct investments in high value solar technology to high resource value areas served by transmission.

c. Transmission Analysis

The Test Case Transmission Analysis for the Proposed Brenda SEZ is inherently flawed. The analysis was performed without taking into account other SEZs, and may suggest that power can be readily exported from the Brenda SEZ to the Los Angeles load center without downstream upgrades and without accounting for generation projects in the queue.

The final PEIS should instead provide for BLM to work with the relevant transmission planning entities to identify and designate transmission corridors sufficient to support transmission network upgrades and additions needed to deliver power from SEZs to load centers, taking into account all relevant factors, including the potential energy deliveries from a SEZ, optimizing existing infrastructure, and minimizing the need for new corridors and infrastructure.

CONCLUSION

The signatories to this letter have worked hard to reach the agreements set forth in this letter. We thank you in advance for your serious consideration of our recommendations.

Sincerely yours,

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/s/

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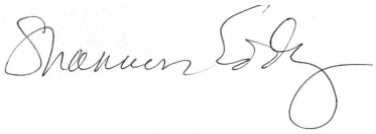

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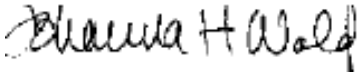

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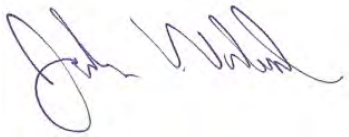

John M. Woolard
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Thank you for your comment, Jill Yung.

The comment tracking number that has been assigned to your comment is SEDDsupp20178.

Comment Date: January 27, 2012 20:42:04PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20178

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January 27, 2012 76145.00002

VIA OVERNIGHT USPS & INTERNET

Solar Energy PEIS
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Re: Comments of the Solar Energy Industries Association and the Large-scale Solar Association on the Supplemental Draft Solar PEIS

When we prepared our comments on the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States ("Draft PEIS" or "DPEIS"), the fledgling utility-scale solar industry and the Bureau of Land Management ("BLM") were still celebrating their accomplishments of 2010. With nine projects and an expected 3,671 megawatts ("MW") approved for development, the immediate future for large-scale solar development on public lands was promising. The prospect of federal loan guarantees, though limited in duration, further shored up confidence that the solar industry could radically change our energy supply chain to fight climate change and maximize the utility of our public lands.

Even at a time when confidence was high, however, our clients, the Solar Energy Industries Association ("SEIA") and the Large-scale Solar Association ("LSA"), and their member companies (collectively, the "Solar Industry"),[1] had significant concerns that the Draft PEIS, intended to facilitate near-term utility scale solar energy development on public lands, would instead foreclose the possibility of significant new development. Our prior comments noted that the proposed Solar Energy Zone ("SEZ") approach was underdeveloped and consequently too restrictive. Among our many recommendations, we called for a flexible process for approving applications in areas outside of SEZs (other than in high conflict areas) that would remain in place at least until BLM designated SEZs of sufficient size and number in areas where development would be feasible.

When the Department of the Interior ("DOI") announced in July, 2011, that BLM and the Department of Energy ("DOE") would prepare a supplemental draft of the PEIS ("Supplemental Draft PEIS" or "SDPEIS") to "address key issues . . . including developing well defined criteria for identifying solar energy zones; incentives for encouraging developers to site their projects in the zones and a variance process for those who wish to develop facilities outside such zones; [and] additional surveys of biological and cultural resources in the zones",[2] the Solar Industry had expectations that the SDPEIS would respond to its

[1] As noted in our May 2, 2011 comment letter on the Draft PEIS, LSA and SEIA are coalitions of solar companies that seek to promote the environmentally responsible development of solar energy and associated transmission. SEIA and LSA are committed to working with the Department of the Interior ("DOI"), Department of Energy ("DOE"), and other federal agencies, environmental and conservation organizations, Native American tribes, state agencies, and other stakeholders to achieve this goal.
[2] BLM, Salazar Approves Major Renewable Energy Projects, Identifies Next Step in Solar Energy Development (July 14, 2011) (News Release), *available at* http://www.blm.gov/wo/st/en/info/newsroom/2011/july/NR_07_14_2011A.html.

concerns. We were thus surprised to find in the Supplemental Draft that instead of increasing the number and size of zones, BLM reduced the already limited opportunities for development in SEZs by over 50 percent (in terms of acres); instead of creating a temporary and manageable variance process to bridge the gap between where SEZs were and where they needed to be, BLM adopted demanding new criteria that appear to lack a peer-reviewed scientific basis; and instead of conducting additional surveys to reduce the potential for resource conflicts in the proposed zones, BLM relied on unverified concerns in comment letters to take more land out of development. The end result was a planning document that in many ways poses an even greater threat to the future of solar development than the original draft.

The additional impediments to solar development proposed in the SDPEIS come at a particularly tough time for the Solar Industry. Financing has become increasingly more difficult to secure and rampant underbidding by new speculators in the market has interfered with efforts by more experienced developers to finish what they started and apply the lessons learned from the first round of development to new projects. Now is not the time to put more challenges in front of the Solar Industry if it is to meet the national goals established by and for DOE, BLM, and DOI.

Despite lingering concerns about the current state of the PEIS, we appreciate the significant amount of work that has gone into its development and recognize that BLM has a pressing need to finalize a program that will provide a foundation for a holistic approach to the simultaneous development of multiple utility-scale solar projects on public land. On behalf of the Solar Industry, we have therefore focused our comments on constructive suggestions that BLM and DOE can implement without further delaying the release of the PEIS. From the perspective of the Solar Industry, these changes are essential if the PEIS is to accomplish its primary objective: to facilitate environmentally responsible and technically and economically feasible utility-scale solar siting, permitting, and development over the long-term.

The SDPEIS strongly suggests that BLM is leaning towards the Modified Program Alternative, which in contrast to the Modified SEZ Alternative and the original SEZ Program Alternative, would allow for at least some development outside of SEZs. This development throws the variance process in particular into sharp relief and has also shifted our focus to the exclusion area criteria. As a result, some of our comments here will address material that appeared in both the original Draft and the Supplemental Draft. In sum, those comments are as follows:

1. Pending Applications: Due to some potentially confusing statements in the SDPEIS, the Solar Industry believes that BLM must clarify that pending applications, as that term is defined on page 1-9, will be evaluated under existing policies and not subject to the design requirements, mitigation requirements, or any other criteria that will apply to future applications, as required by the forthcoming Record of Decision ("ROD") for the PEIS and/or the PEIS itself.

2. New Zones: Even with the prospect of approval for pending applications and the 285,000 acres made available for development within the proposed SEZs, BLM should recognize that the SDPEIS does not provide sufficient development opportunities. The SDPEIS took zones that were already too small and too few and whittled them down even further. Subtracting acres in zones that have pending and approved applications, only 223,884 acres are now actually available for new projects and these acres have not been allocated pursuant to a plan to facilitate clustered development. With a median size of only 5,873 acres, most SEZs can support only one or two utility-scale projects. In addition, some potentially useful zones are already full. For example, of the 5,717 developable acres in the Imperial East SEZ, only 1,770 are not subject to

an existing application. The recognition that zones are inadequate should provide a basis for BLM's priorities in implementing the PEIS in the immediate future.

3. Flexible Variance Process: BLM should adopt a workable variance process that will avoid the creation of a de facto moratorium on new solar projects on public lands while BLM locates, studies, and approves much needed new SEZs. The variance process proposed in the SDPEIS, and the lands the SDPEIS would open to variance applications, are not sufficient. Although the SDPEIS makes 20 million acres of land available in variance areas, only 1.2 million acres are in California, near load and transmission. The Final PEIS should relocate a significant amount of the variance acres to areas where renewable energy generation facilities are in demand. In addition, BLM should clarify that the "factors" listed for obtaining a variance are largely just individual considerations for BLM's process when deciding whether to grant a variance.[3] Even with this clarification, certain variance application factors (located in low, not moderate, resource conflict areas, caps on the number of desert tortoise, and requirements to minimize transmission and infrastructure development and water use) should be eliminated or significantly modified. These factors, as drafted, are not essential to ensure smart from the start development across the entire area of the PEIS.

4. Height and Technology Limitations in SEZs: The proposed height and technology limitations are excessive, as they would exclude even efficient alternative photovoltaic ("PV") technologies (e.g., PV with trackers) and thereby provide perverse incentives to increase project footprints. Furthermore, the presumption that taller technologies will have greater impacts on visual resources is questionable. The 10 foot height limit and PV-only limitations on more than 25% of the SEZ acreage should consequently be eliminated, with visual considerations applied only on a case-by-case basis in the National Environmental Policy Act ("NEPA") environmental review process to mitigate actual visual impacts exacerbated by project height.

5. Exclusion Areas: BLM should not identify exclusion areas based on arbitrary, and misguided, assumptions about the technical and economic limits of solar energy generation technologies. Along these lines, BLM should not exclude lands based on technological factors including slope and insolation. In addition, BLM must provide more concrete definitions for exclusion criteria that are currently vague and subjective. Some limits on the currently unbridled discretion of BLM staff to designate exclusion areas are also needed. More generally, as noted in the Solar Industry's comments on the Draft PEIS, BLM needs to provide transparency regarding what lands are excluded and for what reasons.[4] A map depicting the exclusion areas associated with each

[3] For a few of the variance factors, it would make sense to apply them as requirements. For example, applicants should be required to demonstrate technical and financial capabilities, as is the case under existing BLM policies. A requirement that provides some limitations on development that conflicts with desert tortoise populations should also be imposed, but, as explained in more detail below, Desert Tortoise Variance Requirement Option 2 is not the appropriate solution.

[4] *See* DPEIS at 2-9 to 2-10 (recognizing that the exclusion areas maps represent an amalgam of the following considerations: slope greater than or equal to 5%; average solar insolation of less than 6.5 kWh/m2/day; critical habitat for threatened or endangered species as designated by the USFWS; "and the following areas designated under various BLM programs: Areas of Critical Environmental Concern (ACECs); Desert Wildlife Management Areas (DWMAs); flat-tailed horned lizard habitat, Mohave ground squirrel habitat; ROW exclusion and avoidance areas, No Surface Occupancy (NSO) areas, and Special Recreation Management Areas (SRMAs)"); *id.* at 2-10 (recognizing that "Exclusion areas that could not

exclusion criteria would most effectively convey this information. Finally, BLM should not exclude areas from development based on criteria that it has previously identified as a medium conflict indicator without a transparent and sound scientific basis for determining that such conflicts are too difficult to resolve.

6. The Importance of Transmission in Selection of Zones: BLM should establish a clear process for the expedited selection of new zones that additionally takes into account existing transmission or the prospects for development of new transmission. BLM's current pledges to participate in regional transmission planning efforts do not provide the meaningful commitment that is required. (*See, e.g.*, SDPEIS at p. 2-25.) When it comes to creating much needed new SEZs, BLM cannot wait for other proceedings that might identify one or two additional zones, but are otherwise focused on different purposes and needs. BLM should already be studying the areas surrounding the locations of leading transmission proposals so that it will be in a position to approve the development of projects almost as soon as decisions regarding transmission are made.

7. Transmission Analysis: BLM should expand its transmission analysis to include additional factors. Thermal rating, without a power flow analysis, provides BLM with only a partial picture of what existing variables already constrain transmission. In relying exclusively on this consideration, BLM overlooks "parallel" or loop flow (power from a source to sink will travel multiple paths). The approach taken in the SDPEIS also ignores the required contingency analysis, which will conclude that a line is "full" to cover a contingency even if the line could, under normal conditions, physically carry additional capacity. Finally, the model transmission analysis that BLM proposes to follow does not take into account the massive queue that has built up in California and other western states. Developers have already spoken for significant amounts of hypothetical transmission.

As drafted, the SDPEIS offers (1) inadequate zones, (2) a troubling and uncertain variance process, and (3) arbitrary exclusions. For the reasons given above and below, immediate action is needed to address these issues. If these issues cannot be addressed, the Solar Industry would urge the DOI and the BLM to adopt the No Project Alternative. The following discussion provides guidance on how we believe these issues can and should be addressed in a manner consistent with BLM's other priorities.

I. PENDING APPLICATIONS

The SDPEIS states that pending applications will be subject to "continued processing under existing policies,"[5] including the February 2011 Instruction Memoranda (Nos. 2011-059 to 2011-061) (hereinafter "IM 2011-059" and "IM 2011-061", respectively).[6] The rest of the SDPEIS is consistent with this statement, with the exception of a statement on page 1-11, which says:

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be mapped due to lack of data would be identified during pre-application consultations with local BLM staff or site-specific evaluation of individual ROW applications").

[5] SDPEIS at p. 1-9 (Table 1.7-1).

[6] Available at: http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2011/IM_2011-59.html; http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2011/IM_2011-061.print.html.

> Pending applications on lands proposed as exclusion areas for utility-scale solar energy development in the Final Solar PEIS are likely candidates for denial.

BLM should delete this sentence. The PEIS otherwise makes clear that *all* applications[7] that qualify as pending applications, as that term is defined on pages 1-9 and 1-10 and in Table 1.7-1, should be subject to existing policies and not subject to the PEIS ROD. In light of the fact that BLM is not making sufficient lands available to support state and federal renewable generation development goals in the near term, it is critical that viable pending applications are treated fairly in the permitting process and not rejected out-of-hand because of lines subsequently drawn in the PEIS. These applications will undergo site-specific review as required by NEPA.[8] They were furthermore considered by BLM and have been consistently exempted from the requirements of the forthcoming PEIS ROD in both drafts of the PEIS. Any retroactive change in the status or approval process applicable to these projects could considerably stall the near-term development of utility-scale solar facilities—a result that could have significant environmental consequences not previously considered in the PEIS. Consistent with applicable legal requirements, BLM must consequently continue to process these applications under the framework in place before they came within the scope of the PEIS.[9]

At the same time, consistent with Instruction Memorandum No. 2011-060,[10] the Solar Industry strongly encourages BLM to seek confirmation of financial and technical capability from applicants for projects in the five states other than California (where such an audit was already performed in 2011) to winnow out speculative applications. (*See* Attachment B at p. 3 (May 2, 2011 Solar Industry Comment Letter).) This exercise will give BLM a better sense of the amount of land being made available for solar projects under the PEIS—and the generating capacity of the program—and requires a minimal expenditure of resources.

II. THE VARIANCE PROCESS MUST BE CLARIFIED AND MADE MORE FLEXIBLE

The SDPEIS provides a set of Variance Application Factors that will be "considered" by BLM when evaluating variance applications. Certain factors, however, describe "requirements" that applicants would need to satisfy to move an application forward. The Department has indicated that the variance factors will generally be treated as circumstances to be considered when evaluating an application. The Solar Industry views this interpretation as being essential to the success of the Solar Program, and further notes that if the variance factors were instead applied as requirements, virtually none of the 20 million acres classified as variance areas would be available for development. To ensure that variance lands represent a real option for siting projects, something that is critical in light of the limited amount of land

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[7] BLM should clarify that "pending applications" include second and third in line applications filed before the applicable deadlines. BLM should also clarify that amendments to previously approved applications are pending applications for the purposes of the SDPEIS.

[8] The PEIS should make clear that in performing this NEPA review, BLM will not rely on the maps or the resource determinations of the PEIS to inform its pending project NEPA analyses. Those analyses should not, explicitly or implicitly, tier off of the PEIS.

[9] We note that Appendix A does not contain the universe of known pending applications as BLM has defined that term. The Final PEIS should correct Appendix A and present a complete list. For clarity the list should include both "first in line" and later in line applications that qualify as "pending" based on their filing date.

[10] Available at: http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2011/IM_2011-060.print.html.

available in SEZs, BLM should further clarify that the factors should be evaluated individually, not cumulatively.

Establishing that the factors are "considerations" and not requirements is, however, only the first step in the process of providing much needed clarity on how the variance factors will operate. Certain factors are somewhat ambiguous or outright inappropriate. We therefore urge the following modifications:

A. Minimal conflict factors

The SDPEIS states that BLM will, when evaluating a variance application, consider "Documentation that the proposed project will be located in an area with low resources value and where minimal conflict with adjacent lands is likely (e.g. . . . brownfields . . . ;. . . . fallowed agricultural lands; [etc.])."[11] While these types of "minimal conflict" lands would be ideal sites for development and could be awarded special preference, in practice they generally do not exist on BLM land. Nor do we know of project land potentially "adjacent" to such lands.[12]

The failure to provide a workable variance process would essentially impose a moratorium on new utility-scale solar projects for the foreseeable future. To avoid this bleak future, BLM should ensure that the variance process is not unduly burdensome. Instead of requiring that variance projects be located in minimal conflict areas, BLM should allow the siting of such projects in the designated variance areas (i.e., not exclusion areas) that additionally do not meet any of the "high conflict" criteria set forth in BLM's Instruction Memorandum on pre-application and screening criteria for solar and wind energy applications (IM 2011-061) (describing characteristics of high, medium, and low conflict lands).

BLM has adopted most of the medium conflict criteria in the Instruction Memorandum as exclusion area criteria. The PEIS would therefore, for the most part, leave only the low conflict lands available for development. Even this approach, however, would be significantly less restrictive compared to the least/minimal conflicts standard in the SDPEIS. Specifically, under the Instruction Memorandum, as modified to account for the exclusion criteria in the SDPEIS, BLM could, and should, allow projects in the following areas:

- Lands specifically identified for solar or wind energy development in BLM land use plans;
- Previously disturbed sites or areas adjacent to previously disturbed or developed sites;
- Locations that minimize construction of new roads and/or transmission lines;
- Lands adjacent to designated transmission corridors;
- Lands that are not excluded due to their visual resource classification, subject to review and additional mitigation where required;
- Lands identified as suitable for disposal in BLM land use plans;
- Lands with wilderness characteristics outside Wilderness and Wilderness Study Areas that have been identified in an updated wilderness characteristics inventory, where conflicts can be resolved;

[11] SDPEIS at p. 2-35 (lines 8-16).
[12] A group of solar companies and environmental groups previously suggested that a "low conflict" approach would involve certain lands that would be "minimal" conflict and "avoid" certain lands that were high conflict, but no company has *ever* suggested that "minimal" conflict lands alone would qualify for a variance.

- Department of Defense operating areas, including areas with significant radar, airspace, or land use conflicts, where conflicts can be resolved;
- Areas where project development may adversely affect lands acquired for conservation purposes, where conflicts can be resolved;
- Areas with relatively low conflict characteristics that are adjacent to private lands that might be used for development; or
- Areas within groundwater basins that have been over appropriated by state water resource agencies, where a project proposes small or insignificant groundwater uses or commits to provide mitigation measures that will reduce the project impacts to an insignificant level.

In addition, we discuss below certain exclusion area factors (criteria that are akin to the medium conflict criteria in the Instruction Memorandum) that are inappropriate. To the extent that any of the criteria identified below are removed from the exclusion area criteria list, that change should open up those lands to variance applications, to the extent that those lands do not meet other exclusion area or high conflict area criteria.

If these standards are applied instead of the least/minimal conflict standards, variance projects might have a real chance of being sited and approved in appropriate areas. It is absolutely necessary for Solar Industry to have a real variance development option, at least initially, to compensate for the inadequate size and number of existing zones.

B. Desert Tortoise "Variance Process Requirements"[13]

The SDPEIS describes two options for "Desert Tortoise Variance Process Requirements." Option 1 would not impose any special variance requirements and would "consider all variance applications within the range of desert tortoise on a case-by-case basis in coordination with the [United States Fish and Wildlife Service ('USFWS')]." (SDPEIS at p. 2-35.) In stark contrast, Option 2 states that applicants for projects within the range of desert tortoise, outside of proposed connectivity areas, "*must provide*" documentation that tortoise density for the proposed project site is less than or equal to five tortoises per square mile, that the number of tortoises that would need to be translocated would be less than or equal to 35, and that the project will maintain at least one three mile wide, minimally disturbed connectivity corridor. (*Id.* at p. 2-35.) Applications within "proposed" connectivity areas will generally be discouraged, unless applicants can, after surveying an area three to four times larger than the proposed project site, identify a location for the project where tortoise density is less than or equal to two tortoises per square mile and native vegetation communities are degraded. (*Id.* at pp. 2-35 to 2-37.) The Solar Industry favors Option 1, because Option 2 has several unsupported, rigid requirements that have no place in the permitting process and no scientific basis.

The Solar Industry understands that the USFWS revised Desert Tortoise Recovery Plan ("DTRP") issued in May 2011 supports translocation density and movement corridor limitations. However, we have seen *nothing* in the revised DTRP to support the restrictive numerical limits in Option 2. The proposed numbers appear to have been pulled from thin air; no publically available or peer review document

[13] The title of this subsection on page 2-35 illustrates why the Industry has valid concerns about BLM's intent with regard to how it will use the variance "factors."

appears to justify them.[14] The desert tortoise Proposed Connectivity Areas map on page 2-36 similarly lacks a meaningful explanation and/or demonstration of widespread support from the scientific community. Indeed, a recent US Geological Survey ("USGS") study of the published literature concluded that "[p]ublished scientific information on the effects of any form of renewable energy development . . . is scant," and the limited research done to date has largely focused on the impacts of wind farms on birds and bats.[15] Neither the DTRP nor the recent USGS article serves as a basis for the lines drawn on the Proposed Connectivity Areas map.[16]

A search of the Mojave Desert Ecosystem Program Voyager GIS database further does not reveal a layer consistent with the Proposed Desert Tortoise Connectivity Areas as mapped in Figure 2.2-2. The reasonableness of the proposed connectivity area boundaries consequently cannot be assessed using publicly available information. It is furthermore impossible to assess the impact of the proposal on specific lands because the map is so small and obscured by certain features, such as highway labels. To ensure that public participants can make thoughtful, informed comments on this map, BLM must provide a description of the base layers and GIS processing techniques.

Given what some SEIA and LSA member companies know from their specific development experiences, the representations made in the Proposed Connectivity Areas map are questionable. BLM must explain the basis for the Proposed Connectivity Areas map (Figure 2.2-2) before drastically departing from its prior determinations. If BLM cannot provide a scientific basis for the map, then it should be removed from the PEIS.

The Solar Industry does not intend to develop solar projects in high-density desert tortoise areas and agrees that such areas should be avoided. However, rigid numerical requirements with no foundation in scientific evidence are improper and unjustified. The USFWS has not hesitated to intervene in specific areas where it has had concerns about connectivity.[17] Similarly, BLM has previously taken movement corridors and the contributions of a project to habitat fragmentation into account. The "new" emphasis on connecting functional habitat in the revised DTRP is not new to these agencies and BLM has provided no

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[14] Indeed, in the Revised Biological Opinion for the Ivanpah Solar Energy Generation System ("ISEGS"), issued *after* the revised DTRP, USFWS explained that linkage areas must be determined on a case-by-case basis and further determined that a 1.4 mile linkage area would be sufficient for that project. (USFWS, Biological Opinion on BrightSource Energy's Ivanpah Solar Electric Generating System Project at 72 (June 10, 2011), *available at* http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/needles/lands_solar.Par.71302.File.dat/ISEGS_Reinitiation,%20Final%20BO.pdf.) The Desert Sunlight Biological Opinion also has a narrower requirement.

Three mile-wide connectivity corridors are not present throughout the range of desert tortoise even under natural and historical conditions. The Mojave population of desert tortoise has historically been well connected even in the presence of connectivity corridors much narrower than three miles. Stating that connectivity corridors of this size are *required* for the continued genetic flow of the desert tortoise thus directly contradicts best available science (Murphy et al. 2007; Hagerty and Tracy 2010).

[15] Jeffry E. Lovich & Joshua R. Ennen, *Wildlife Conservation & Solar Energy Development in the Desert Southwest, United States*, BioScience, Dec. 2011, at 982.

[16] Indeed, the PEIS should not rely on the USGS study at all, given that the study itself relies on the Draft PEIS to support observations about the desert tortoise, such as the observation that the species' "very presence at a site may be sufficient to exclude [utility-scale solar energy development] in special cases . . . ." *Id.* at 984.

[17] Industry remains quite concerned regarding the scientific basis behind the connectivity issue.

explanation for its proposed departure from case-by-case, site specific evaluations in coordination with the USFWS to determine whether desert tortoise considerations, including the feasibility of translocation, should work to prohibit development in a particular area. Again, at this time, the Solar Industry unanimously favors Option 1 over the arbitrary numeric limits that would apply under Option 2. At the very least, procedural safeguards—not numeric criteria—should be used to address potential conflicts between utility-scale solar projects and desert tortoise populations.

C. Transmission and infrastructure minimization requirements

The requirement to include a transmission plan ("[d]ocumentation that the proposed project will minimize the need to build new roads and/or transmission infrastructure")[18] in the Plan of Development ("POD") (alternatively, the variance application) could significantly and unnecessarily delay the permitting process in states where the transmission planning process is protracted and cumbersome. For example, in California the current wait time for transmission analyses is up to 24 months and utilities only accept applications at certain times of the year.[19] Developers should only be required to include an *estimated schedule for completion* in the POD. Applicants can then be required to submit the transmission analysis when it is available.

Similarly, variances should not be restricted to areas where "minimal" additional infrastructure (transmission, roads) will be needed. This requirement precludes the possibility of expanding existing transmission to new locations and sets up an artificial barrier for variances in areas where solar development would otherwise be allowed and transmission can be built. As BLM recognizes elsewhere in the SDPEIS, "it is likely that most new utility-scale solar energy development will require new transmission capacity . . . ." (*Id.* at p. 2-69.) At the very least, if infrastructure needs are a factor, "minimization" should not be objective. BLM could instead consider whether an applicant can demonstrate that it will optimize the capacity of existing and new infrastructure and avoid duplication in the use of or need for existing and new transmission, transmission interconnect facilities and access infrastructure.

D. Minimize impacts on water

The PEIS additionally proposes to require "[d]ocumentation that the proposed project will minimize impacts on water resources." (SDPEIS at p. 2-37.) Water use and groundwater impacts are site-specific considerations that should be addressed through the NEPA process and other applicable law. Companies should be encouraged to, and in some cases may be required to, optimize their technology's efficiencies with respect to water impacts. On top of this, mitigation measures may be imposed. A general requirement to "minimize impacts on water resources" (whatever that might mean) is an unworkable standard that is not suited to be a programmatic consideration.

E. Additional layers of pre-application process

[18] SDPEIS at p. 2-37.

[19] The California Independent System Operator Corporation ("CAISO") interconnection process currently restricts the submission of new applications to an Annual Interconnection Request window that opens and closes every March. CAISO's interconnection study process starts in June and takes 420 days. These steps must be completed before a developer can sign a Generator Interconnection Agreement.

Although not discussed in the Pre-application Meeting section (SDPEIS at p. 2-33), the Variance Process describes a public outreach requirement that would precede BLM's acceptance of a project for *subsequent* review under NEPA. (SDPEIS at p. 2-40 (describing a "pre-scoping public meeting that falls outside of the NEPA process for variance applications").) The public outreach process should begin with NEPA. The Variance Process should not introduce another layer of public review.

Along these same lines, the SDPEIS should not require Class III cultural resource surveys *before* an applicant may submit an application. (*See* SDPEIS p. 2-38.) Such surveys are extremely expensive. Applicants thus might waste hundreds of thousands of dollars to survey proposed project sites that BLM could reject from the outset for other reasons. For purposes of evaluating a variance application, BLM should instead require Class I or II cultural surveys, which can be used to identify areas of potential effect ("APEs"). The information obtained from these less rigorous protocols is entirely appropriate, and suitable, for use by BLM when evaluating applications. BLM should avoid expensive, premature survey requirements, as requiring developers to invest in a site early on will only discourage them from considering other locations.

F. General comments on the Variance Process

The variance areas should not be further reduced in the Final PEIS, as BLM suggests they will be on page 2-33 ("As the BLM continues to refine the list of proposed exclusions under the modified program alternative . . . the amount of land in variance areas will likely be reduced."). The exclusion areas, as explained in more detail below, are already too large. In addition, further restrictions on the development of utility-scale solar energy generation facilities, which could for the most part be permitted today after complying with NEPA, will expand the scope of the federal action being undertaken in the SDPEIS and could affect the environmental effects in a variety of ways. Unlike restoring opportunities for case-by-case evaluations of project applications (i.e., expanding variance areas), which BLM has analyzed as part of the No Action Alternative, significantly expanding the exclusion areas in the ROD for the PEIS could trigger a requirement to perform additional environmental review.

In general, there is obviously a tension between putting restrictions on variances so as to encourage zonal development, and lessening restrictions on variances (still subject to all biological and cultural screens) because the zones at this time are so inadequate. Until zones are adequate, however, BLM must provide a workable variance program, to ensure that development opportunities on public lands are not unduly constrained and to allow the use of public resources to achieve national renewable energy production objectives.

III. RESTRICTIONS IN PROPOSED ZONES

The current height and technology limitations are excessive, as they would exclude even efficient PV technologies (*e.g.*, PV with trackers), as well as taller, more land efficient power towers, and thereby provide perverse incentives to increase project footprints. Furthermore, the presumption that taller technologies will have greater impacts on visual resources is questionable. Any decision to allow solar development will create some visual contrasts from some vantage point. From a distance or from an elevated position, however, the impact of 10 foot panels on visual resources will not be appreciably different from the impact of 20 foot panels, troughs, or in many cases, power towers.

The 10 foot height limit and PV-only limitations on more than 25% of the SEZ acreage[20] should be eliminated, with visual considerations applied only on a case-by-case basis to mitigate actual visual impacts exacerbated by project height. Applied in this way, BLM could take into account whether height restrictions might mitigate impacts on visual resources based on the location of a project, the layout of its major components, and the number and types of viewers. BLM could further take into account the overall public reaction to a particular project. As recognized by BLM in the DPEIS, "[s]urveys have indicated that solar energy is generally viewed favorably by the public, because it is regarded as a nonpolluting, renewable resource, and it may be that, similar to wind energy projects, utility-scale energy development projects would be viewed less negatively or positively in terms of visual impacts as a result . . . ." (DPEIS at p. 5-162 (citations omitted).)

A blanket prohibition based on presumptions about the site-specific impacts of technology height is inappropriate. Visual impacts are but one of several factors that should be weighed in determining where to site a facility. Other factors include the energy production profile, efficiency of land use, and project viability (probability of obtaining Power Purchase Agreement ("PPA"), experience, financial strength, etc.). Unless a project is proposed in an area "*currently designated* as Visual Resource Management Class I or Class II", visual resource concerns alone should not provide the basis for an effective ban on development. (IM 2011-061 (discussing high conflict criteria; emphasis added).)[21]

IV. EXCLUSION AREAS SHOULD NOT BE BASED ON TECHNICAL CRITERIA OR THE UNBRIDLED DISCRETION OF BLM STAFF

The SDPEIS proposes to defined right-of-way ("ROW") exclusion area as "areas which are not available for location of ROWs under any conditions", a definition taken from BLM Land Use Planning Handbook H-1601-1. (SDPEIS at p. 2-15.) This unforgiving standard must be imposed with caution, particularly in the context of a program that is intended to last for a significant period of time and further intended to address a new and dynamically changing industry. More specifically, the criteria used to identify exclusion areas must include only the elements that are *essential* to preserving environmental values and must further be capable of uniform interpretation. Several of the exclusion criteria do not fit this vision.

A. Technical and Economic Criteria

Chief among the inappropriate criteria are those based on the presumed capabilities of developers' technologies: a 5% slope limit and a minimum insolation requirement of 6.5 kWh/m^2/day. Technology not only exists today, but is being deployed in the market, to make use of both higher slope and lower insolation lands.

As the SDPEIS notes[22], companies are currently building some parts of projects on slopes of up to 10% and in the future may be able to do more. A slope limitation of 5% is therefore antiquated, and does not have a reasonable basis. In addition, companies are now permitting and constructing projects in areas of

[20] Approximately 74,000 acres of SEZ land is restricted by the 10 foot height restriction. This height restriction effectively eliminates development in these areas of the SEZs.
[21] In addition, although we hope that BLM will do away with the unsupported and unnecessarily burdensome variance criteria identified in Section II, to the extent that any of these factors remain in effect BLM should clarify that they will not be applied to projects in SEZs.
[22] SDPEIS at p. D-3 (Appendix D).

the southwest with less than 6.5 kWh/m^2/day (*e.g.*, in the San Joaquin Valley). More broadly, large amounts of solar generation are coming on line in states such as New Jersey, where the insolation is far less than in the Southwest. The assumption that development will be uneconomic in areas with insolation levels of less than 6.5 kWh/m^2/day is not supported by real world evidence.

One compelling reason to drop technical criteria for exclusions areas is that such requirements might create "edge effects" by limiting the flexibility a developer has to modify its proposed project footprint to use adjacent (higher slope) lands to avoid environmentally sensitive areas. Excluding higher slope lands that could be developed in an environmentally-responsible fashion would increase sprawl, by eliminating the potential to maintain the planned size of a unit in one place and creating additional development pressure to generate the forfeited power at sites located elsewhere. At a minimum, if part of a project area exceeds the SPDEIS technology limits (typically, this would involve areas with higher slopes), then BLM should have the flexibility to approve the project as part of a case-by-case determination.

The exclusion of lands with solar insolation levels of less than 6.5 kWh/m^2/day is particularly inappropriate. As recognized in the DPEIS, BLM imposed this threshold based on *assumptions* about where utility-scale development is most economically viable.[23] To set the record straight, Direct Normal Irradiation ("DNI") measurements (represented as kWh/m^2/day) only assess the amount of solar radiation delivered to a particular area directly from the sun. For technologies that use mirrors of lenses for reflection/refraction (concentrating solar power, or "CSP"), DNI is the appropriate measure of the solar resource. These technologies require direct sunlight for efficient operation. However, conventional PV technologies use direct, diffuse, and even ground-reflected solar radiation (collectively, Global Horizontal Irradiation or "GHI"). DNI measurements consequently provide an incomplete assessment of the solar resource in a particular area as far as PV developers are concerned. Additionally, some CSP developers have determined that they can economically develop projects in areas with insolation levels as low as 5.5 kWh/m^2/day. Even if it might be appropriate to limit the development of utility-scale solar power plants on public lands based on a single factor in a developer's complex assessment of a project's economic viability, the 6.5 kWh/m^2/day threshold is not an appropriate or justified standard.

In addition, although the SDPEIS includes maps intended to depict the extent of the areas excluded based on insolation levels, the measurements for a given plot of land cannot be known without a site-specific study. The National Renewable Energy Laboratory ("NREL") solar resource estimates relied on to plot potentially appropriate development are regularly off by as much as 30%. Unlike previously designated Areas of Critical Environmental Concern, Desert Wildlife Management Areas, National Landmarks, etc., BLM cannot plot insolation on a map with certainty. Its usefulness as a screening tool on a programmatic level is consequently very limited.[24]

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[23] DPEIS at p. 2-7 ("That criterion was established on the basis of the *assumption* that at insolation levels below 6.5 kWh/m2/day, utility-scale development would be less economically viable given current technologies." (emphasis added)).

[24] Regarding insolation, BLM should also recognize that the economic viability of a project is not a concern for BLM under NEPA. Consistent with FLPMA, BLM must determine that the approval of a ROW application to develop and operate a utility-scale solar facility represents the highest and best use of the land. Because projects in variance areas will require a site-specific land use plan amendment as part of the ROW grant process, however, this determination is not part of the federal action being contemplated in the PEIS. BLM therefore has the legal authority to do the right thing and remove insolation from the list of exclusion criteria.

The Solar Industry believes that removing the insolation and slope criteria from the exclusion criteria list should not cause any environmental impacts or require further supplementation of the PEIS. Lowering the insolation floor and raising the slope ceiling, or removing these restrictions entirely, will likely increase the number of acres available in the variance area and thereby make additional land available for development after case-by-case NEPA analyses, as discussed below. However, all of the other exclusion criteria in Table 2.2-1 of the SDPEIS would still be in place to protect species, cultural resources and other environmental interests, wherever they are located. In addition, those lands—and much more—would be open to ROW applications for solar power plants under other alternatives considered in the SDPEIS and under existing rules. The proposed changes consequently do not make a decision, irreversible or otherwise, that would open more lands to development; rather, they simply take less land out of the current inventory of potential sites compared to other alternatives considered in the PEIS. The public has had a meaningful opportunity to comment on this and was given notice that the exclusion criteria may be too restrictive to allow sufficient land for solar energy development. (*See, e.g.*, SDPEIS at p. 2-69.) This change would not call into question the SDPEIS' sufficiency as an informational document.

In addition, the impacts assessment that begins on page 2-51 (Table 2.3-2) repeatedly states that although several types of impacts could be significant across the 20 million acres of proposed variance areas, "impacts could be minimized due to the required variance process." In other words, impacts from development in the variance areas are expected to be handled on a case-by-case, site-specific basis. The environmental impacts of moving a project onto higher slope lands and economic impacts of operating a project in an area with a lower insolation rating can be handled through that process.[25] The alternative, arbitrarily imposing technology-based screening criteria to restrict use of the public lands based on assumptions about the technology, would be clearly erroneous—especially in light of the fact that the Solar Industry has demonstrated that the assumptions are wrong.[26]

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[25] To further guard against allegations that removing these exclusion criteria might trigger the need to do a further supplemental review, BLM could instead allow applicants to propose an "override" of the exclusions through the variance process, at least in areas where slope, insolation, and other developer technology constraints are the source of the exclusion. BLM would, of course, still subject these override application to a full site-specific impact review under NEPA. Alternatively, BLM could allow applicants to depart from the slope and insolation exclusion criteria on a case-by-case basis, offsetting any additional land thereby developed by retiring other variance lands in the vicinity of a project that receives insolation or slope exceptions. Either of these options would further reduce the significance of the proposed changes. To be clear, however, the Solar Industry believes that simply deleting slope and insolation exclusion criteria would not "affect the quality of the human environment in a significant manner or to a significant extent not already considered . . . ." *Marsh v. Or. Natural Res. Council*, 490 U.S. 360, 374 (1989) (citation and quotation marks omitted) (describing the threshold for requiring a supplemental EIS).

[26] Some stakeholders will undoubtedly suggest that removing the technology-based exclusion criteria would trigger the need for yet another supplemental draft PEIS. Under NEPA, an agency must supplement a draft or final EIS where "[t]he agency makes substantial changes in the proposed action that are relevant to environmental concerns," or where "[t]here are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." 40 C.F.R. § 1502.9(c)(1)(i)-(ii). However, "an agency need not supplement an EIS every time new information comes to light [or a change is made in the project design] . . . . To require otherwise would render agency decision making intractable." *Marsh*, 490 U.S. at 373. Rather, a supplement is required only where new information, or changes in the project, could lead to federal action that will affect the

B. Transparency

The process for excluding areas also needs more transparency. Most of the criteria on pages 2-16 and 2-17 are biological and cultural, and most are based on previously published data. The SDPEIS, however, does not provide clear references to the sources of these exclusions. The SDPEIS also fails to specify the criteria relied upon for particular exclusion area designations ("pink lands" on the various maps) and does not provide detailed maps that might allow companies to determine the basis for excluding specific acreage. BLM needs to add this detail to the final PEIS to ensure that the public has access to relevant information about the impacts of each exclusion.

C. Vague and subjective criteria

In addition, certain biological and cultural reasons for excluding lands require further definition and a sound legal or scientific basis for their imposition. Several of the proposed exclusions are vague and destined to be applied inconsistently across different decision makers. For example,

- Exclusion number 8 would prohibit development on lands "where BLM has made a[n unspecified] commitment to take certain actions with respect to sensitive species habitat, including . . . Mohave ground squirrel habitat . . . [and] fringed-toed lizard habitat." This standard should specifically identify authoritative commitments that could properly prohibit development and how they are established.
- Exclusion number 20 would require the exclusion of "additional lands outside the designated boundaries [of properties listed in the *National Register of Historic Places*] to the extent necessary to protect values where setting and integrity is critical to their designation or eligibility." The application of this standard, as drafted, could result in the exclusion of land based purely on individual staff members' sense of what is "necessary", which would not be a proper basis to prohibit development.
- Exclusion number 21 would preclude development in "areas with important cultural and archeological resources", leaving it to BLM field officers to determine, in their unbridled discretion, whether particular resources meet an undefined notion of "important." Again, this would not provide a proper basis to prohibit development.
- Exclusion numbers 25 ("lands within a solar energy development application found to be inappropriate for solar energy development") and 26 (lands previously proposed for inclusion in a SEZ and later (in the Supplemental Draft) deemed to be inappropriate) should only be excluded if they have been carefully studied in a manner that is equivalent to the detailed study of a project study area *and the study results indicate that the area would have high, if not insurmountable, resource conflicts*; exclusions should not be based on presumptions or unsubstantiated concerns

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quality of the human environment in a significant manner or to a significant extent *not already considered* . . . ." *Id.* at 374 (citation and quotation marks omitted, emphasis added). The impact of not imposing slope and insolation screening criteria was considered in the draft documents as part of the No Action Alternative. In addition, the SDPEIS relies on site-specific mitigation to check the impacts of any projects approved in variance areas, so total acreage is arguably not relevant. Preserving the status quo (case-by-case evaluations) should not have any greater environmental impacts not previously considered.

that development in neighboring areas would cause additional impacts.[27] In some of the applications referenced in footnote e, expanding on exclusion number 25, land was actually dropped for business reasons, not in response to biological, cultural, or other environmental concerns.

- Exclusion number 29, the most unrestrained of them all, could be read to allow BLM state or field offices to require exclusions based simply on ecological or cultural *concerns*, regardless of whether those concerns were substantiated at all. Such unbridled discretion would open the variance process to being controlled by individual preferences and undermines the certainty and consistency that the PEIS is supposed to provide, and that is required of BLM under its statutory authorities.

The listing of an area as being excluded has real and practically permanent consequences for the use of public lands for renewable energy generation projects. Consequently, the decision to exclude land must be based on clearly defined authority that ensures that the PEIS only imposes an absolute ban on development in mapped areas where impacts are truly unmitigatable. All other development decisions should be made on a case-by-case basis as part of BLM's conflicts analysis (*see* IM 2011-061), the NEPA process and any Section 106 consultation process.

D. Medium conflict criteria serving as exclusion criteria

As noted above, in Instruction Memorandum 2011-061, BLM proposed three categories of criteria that would be used to "to assist in prioritizing the processing of solar . . . energy development right-of-way applications." Projects with low potential for conflict would be processed in a timely, or possibly expedited, manner. Projects with a medium potential for conflict included those with resource conflicts that could potentially be resolved. Projects with a high potential for conflict might not be authorized.

The exclusion area criteria in the draft PEIS included all of the high conflict area criteria (or substantially similar criteria).[28] In addition, however, they also included most of the medium conflict area criteria—without providing any explanation of this significant change in policy: i.e., why conflicts in these areas

[27] In addition, this exclusion requires further definition to clarify what projects are included. The language of the exclusion itself states that it would apply only to projects where development was determined to be inappropriate "through an environmental review process that occurred prior to finalization of the Draft Solar PEIS." (SDPEIS at p. 2-17.) Read in isolation, this language would seem to refer to the Draft Solar PEIS published in 2010. However, since Desert Sunlight, approved in mid-2011, is among the projects covered by this exclusion, it may be that BLM intends for it to cover projects that had a complete environmental review before either (1) the publication of the Supplemental Draft or (2) the Final Solar PEIS.

[28] The Draft PEIS did not include exclusion criteria identifying "Lands near or adjacent to lands designated by Congress, the President, or the Secretary for the protection of sensitive viewsheds, resources, and values (e.g., units of the National Park System, Fish and Wildlife Service Refuge System, National Forest System, and the BLM National Landscape Conservation System), which may be adversely affected by development." DOE's portion of the SDPEIS only includes as guidance a recommendation to "[a]void impacts on special use lands such as NPS lands, Wilderness Areas, National Wildlife Refuge System lands, ACECs, Wildlife Management Areas, traditional cultural properties and other culturally sensitive sites, critical habitat for special status species, and military operations areas and other regulated military lands."

could potentially be resolved before the solar development ROD becomes final, but not afterwards. To ensure that the PEIS serves its purpose as an informational document describing the rationale for BLM's decisions, it must include some explanation of the reasoning behind banning development on most of the medium conflict lands, especially (1)"Right-of-way avoidance areas;" (2)"Areas where project development may adversely affect National Historic and Scenic Trails and National Recreation Trails;" and (3)"Developed recreation sites and/or facilities . . . ." (*See* SDPEIS at p. 2-16 to 2-17 (exclusion criteria 7, 10, and 18).) We do not contend that all such applications should be granted, for there could be some applications on medium conflict lands where the conflict proves insurmountable and significant. But the very notion of an "Exclusion Area" is that the applicant does not even get to try to resolve these medium conflicts. More explanation for this more drastic and permanent exclusion is necessary.

Finally, just as the SEZs can be reduced over time after a periodic assessment of needs related to SEZs, exclusion areas should also be revisited on a regular basis.

V. A CLEAR AND EXPEDITED PROCESS FOR ADOPTING NEW ZONES MUST BE ESTABLISHED

Regarding the future evolution of the PEIS, BLM should provide developers, local governments, and other interested parties with a clear and expedited process to nominate new zones, particularly until such time as sufficient zones near load and with transmission access have been established to meet federal and state policy objectives. An "open season" for nominating and evaluating new zones should follow the publication of the Final PEIS, with at least biannual open seasons established thereafter. In addition, developers should be allowed to file applications for areas outside of current zones that could be treated as "anchors" for new zones or as independent projects, depending on BLM's assessment of the potential of the area, and without any delay of review or development.

This matter is of critical importance to the success of a zone-based program, and to solar developers. The supplement drastically reduced (by over 50%) the amount of land in SEZs. Of the land that remains, significant portions are taken up by existing applications, proposed height restrictions that would preclude several technologies, and conflicts with Section 368 transmission corridors. The proposed SEZs are additionally too small, with a median size of only 5,873 acres—barely enough for two projects (approximate 683 MW total in each). Six SEZs contain under 5,000 acres and the De Tilla Gulch SEZ contains just 1,064 acres. These SEZs are simply not adequately sized for purposes of facilitating clustered development.

Developers need a process that will allow BLM to quickly add new zones, which in turn is necessary to ensure that sufficient lands will be available to meet Renewable Portfolio Standards ("RPS") goals and provide developers with the flexibility they need to work with the Balancing Area Authorities, the utilities, other transmission owners, and the market to come up with new clusters *that can be built*.

In the near term, BLM needs to diligently pursue the development of new SEZs. Review of the sufficiency of SEZs at least every five years is not enough, and will cause the program to fail to achieve its goals. For the next five years or until the land available for development in SEZs can meet the demand of state RPS and climate change policies, the BLM should instead commit to study potential new zones every year in states with significant renewable energy needs and/or transmission to bring renewable energy to load. In selecting these "SEZ exploration zones", BLM should prioritize the study of lands that have

already been partially studied (e.g., Renewable Energy Development Areas ("REDAs") in Arizona), so that the designation of additional SEZs can be further expedited.[29]

In addition, BLM should clarify that parallel regional planning efforts need not conform to the exact structure of the PEIS. Regional and sub-regional efforts to conduct limited studies of siting options, like the Restoration Design Energy Project ("RDEP") in Arizona, should be allowed to move forward with new innovations. For example, the RDEP intends to undertake studies that might not be sufficient for purposes of establishing SEZs, but will nevertheless provide significantly more information compared to what BLM has collected on the average variance area. These studies could be useful in efforts to identify some of the better variance areas (in other words, they have the potential to create "super variance" areas where BLM might focus developers' or its own efforts to identify new development opportunities outside of SEZs, or areas that might serve as precursors to new SEZs). The objectives and possible outcomes of the RDEP process and similar proceedings that might be undertaken in the future are not incompatible with the PEIS and BLM should make clear that such proceedings are not limited to establishing SEZs, generic variance areas, and exclusion areas as has been done in the SDPEIS. (*See* SDPEIS at p. 2-31.)

BLM should also be looking at developing a zone in the West Mojave *today*. The West Mojave is the area with the best general insolation in the United States, and remarkable proximity to one of the nation's largest load centers. As noted in the Solar Industry's comments on the original DPEIS, with its higher elevation and clearer skies, the solar radiation levels in the West Mojave are, in some locations, more than 10% higher than in the Eastern Mojave. As a result, the amount of land needed to generate the same amount of electricity is 10% less. The quality and nature of the radiation in the West Mojave also make it the single best area for development of concentrating solar power plants within the state of California. Moreover, the area is located in between two large military installations, Edwards Air Force Base and China Lake Naval Air Weapons Station, and much of the land is disturbed and made up of many small, private parcels. The lands in the West Mojave thus offer conditions that make siting solar energy generation projects there attractive for both developers and environmental stakeholders, as evidence by the fact that many in the conservation community have joined with us in calling for the BLM to include the West Mojave as one of the first additional SEZs. Finally, the West Mojave has transmission potential, as Southern California Edison's Tehachapi transmission line and the Los Angeles Department of Water and Power Barron Ridge line are both located in the area. In addition, projects in a West Mojave SEZ could potentially access the grid through the planned South of Kramer line, which will serve Abengoa Solar's permitted Mojave project.

Overall, in designating a new SEZ, BLM should base its decision on NEPA studies which demonstrate that resource conflicts are low or can be addressed and development prospects are high. SEZs should ideally be large enough to allow for siting flexibility and the development of multiple projects (ideally 1 GW

[29] In making this recommendation, the Industry does not mean to encourage exclusive reliance on other regional planning processes, such as the Desert Renewable Energy Conservation Plan ("DRECP") process, to designate new SEZs. These processes, at the least the DRECP in its current form, are not focused on creating zones; the DRECP is intended to develop a habitat conservation plan ("HCP"), not a plan for development. In addition, the DRECP will not provide the necessary relief in a timely manner (current expected completion date is 2014, and even that may be ambitious). A PEIS can be prepared (or supplemented) faster than a HCP, which is designed to tackle different issues.

or more).[30] They must be in areas with access to roads and a suitable workforce. They further must be sufficiently close to load or in areas where transmission can be reasonably expected to be available in time to serve the quantity of generation planned for the zone, considering current transmission planning processes and environmental considerations. Many of the current SEZs fail to meet several of these criteria,[31] and they should consequently not serve as models for the development of new zones.

VI. ASSUMPTIONS ABOUT TRANSMISSION THAT WILL BE USED TO JUSTIFY CURRENT AND FUTURE SEZ LOCATIONS ARE INCOMPLETE AND OVERLOOK LOCATIONS WITH GOOD TRANSMISSION OPTIONS

Sound, coordinated planning of transmission for zones is a critical component of smart from the start development. The process for planning construction and use of new transmission is, however, a complicated beast under the best of circumstances. The attempts by BLM and DOE to wade into these issues in the SDPEIS are admirable, but the analysis in the SPDEIS makes several missteps that must be corrected in the Final PEIS.

To start, the NERC data referenced in the Draft PEIS has not been updated since 2009 and is now outdated. BLM should revise this information to reflect the latest developments. In addition, the "hidden capacity" on existing transmission lines that the SDPEIS assumes will be available, if it truly exists, is, in practice, not actually of use to utility-scale projects because such projects cannot secure financing unless and until they have secured firm transmission capacity that will allow them to reliably transmit all of their generation to load centers.

Moreover, the capacity analysis proposed in the SDPEIS and applied to the Brenda SEZ presents, on its own, a misleading view of transmission availability. Thermal rating, without a power flow analysis, provides only a partial picture of the actual availability of transmission capacity as compared to the results one obtains when accepted transmission planning methodologies are applied. Such methodologies incorporate contingency analysis, which look at the complex, system-wide impacts of adding a generation facility to large alternating current grids given stringent regulatory requirements to maintain the integrity of the system even if multiple faults and line failures occur. Generally speaking, contingency analyses typically reveal additional limitations on the ability to add generation that are not apparent from a first-cut thermal analysis. Finally, the model transmission analysis that BLM proposes to follow does not take into account the massive queue that has built up in California and other western states. Developers, both conventional and renewable, have already spoken for significant amounts of hypothetical transmission.

Any analysis that is conducted without power flow modeling and standard contingency analysis will be flawed and counterproductive to facilitating rational development of high quality solar resources in an environmentally responsible manner. Proper analyses of transmission capacity are complex and resource-intensive, and are best undertaken by the responsible transmission planning entities. BLM and

[30] We say "ideally" because other than the Riverside East SEZ most or all of the SEZs are too small to accommodate multiple projects. It is possible that SEZs will need to be smaller, but ideally they should be large, so as to facilitate needed transmission.

[31] Indeed, in addition to the inadequate size of the SEZ, which is addressed throughout this comment letter, there are no available high-voltage power lines less than 25 miles from proposed SEZs. This is a critical oversight that will impact the feasibility of future development in the proposed zones.

DOE should work hand-in-hand with those entities to obtain the information they need to make proper decisions, rather than attempt to undertake this work on their own.

Additionally, at least while pending projects are still in the pipeline and companies are relying on the variance process while they wait for suitable zones for development, BLM has to consider how to facilitate transmission to these projects as well as zones. BLM further should be aware of projects planned on private land that are located near permitted and pending BLM projects. These private land projects could be used to support new transmission to projects on BLM land, but also may be competing with projects on public land for interconnection points and capacity. The transmission analysis needs to take these circumstances into account.

Overall, we recognize that BLM is not in the business of planning transmission. BLM might be able to impact planning processes by developing a relative ranking of zones and some meaningful development portfolios. BLM could then share these portfolios with Western Electricity Coordinating Council ("WECC")/Transmission Expansion Planning Policy Committee ("TEPPC") and other regional planning entities (e.g., Southwest Area Transmission ("SWAT"), California Transmission Planning Group ("CTPG"), and CAISO) and encourage these organizations to consider BLM's plans in their regular planning proceedings.[32]

BLM's ability to influence these proceedings is uncertain. Notwithstanding that fact, transmission considerations will need to be addressed through coordinated inter-agency efforts. Unilateral solutions, such as dedicated transmission lines to SEZs, as proposed in the PEIS, are not generally financially feasible from the perspective of the private sector, and cannot reasonably be expected to occur absent exceptional circumstances.

BLM can and must work to make transmission availability a central element of the solar program. It can make the most significant contributions by facilitating the construction of planned transmission, and by closely coordinating with transmission planning entities to better understand the transmission will likely be made available and its likely timeframe. BLM should coordinate with transmission planning agencies to identify how it can expedite permitting for transmission projects that will serve renewable energy on public and private lands. In addition, BLM should be targeting areas where transmission projects are most likely to be built in the near term (e.g., areas along the SunZia and Transwest lines) for the development of new SEZs.

VII. COMPETITIVE BIDDING AND LENGTH OF ROW TERMS

A. Competitive Bidding

As stated in the Solar Industry's comment letter on May 2, 2011, competitive bidding would most likely increase the costs of developing utility-scale solar projects on public lands, and thereby decrease opportunities for innovation that will help make the most of the public lands that are used for renewable

[32] Such proceedings include regional planning efforts required by the Federal Energy Regulatory Commission's ("FERC") Order No. 1000, the DOE-funded Regional Transmission Expansion Plan ("RTEP"). Other federal, state, and regional proceedings may also be informative, such as Western Area Power Administration planning efforts, National Interest Electric Transmission Corridor designations, and the Western Governors' Association's Western Renewable Energy Zones Phases III and IV.

energy. Combined with high rental rates, bonds, and other costs, some developers that might have pursued projects on public lands will pursue projects on private lands or not at all. The Solar Industry strongly opposes BLM's proposal to establish a competitive bidding process for solar ROW applications. Individual companies will be submitting comments consistent with this position in response to BLM's advanced notice of proposed rulemaking on this issue. *See* 76 Fed. Reg. 81,906 (Dec. 29, 2011).

B. Term for ROWs

BLM has determined, by policy (WO IB No. 2006-006), that the initial term of a ROW grant issued under the Federal Land Policy and Management Act of 1976 ("FLPMA") generally should not exceed 30 years. However, the 30 year cap is only a policy. The regulations require only that a ROW grant be limited to a "reasonable term" as established by BLM after considering "(i) The public purpose served; (ii) Cost and useful life of the facility; (iii) Time limitations imposed by licenses or permits required by other Federal agencies and state, tribal, or local governments; and (iv) The time necessary to accomplish the purpose of the grant", 43 C.F.R. § 2805.11(b)(1). BLM has stated in guidance documents that it will consider terms greater than 30 years based on the factors set forth in 43 C.F.R. § 2805.11(b)(1) and whether "the applicant/holder can demonstrate the 30 year term and provision for renewal is not sufficient." BLM Policy and Procedures for Issuance of "Long Term" Right-of-Way Grants and Easements Over Public Lands To Be Transferred Out of Federal Ownership 8 (June 2007).

The PEIS alludes to plans to limit the term of a solar ROW grant to 30 years. (SDPEIS at p. 2-2.) BLM's advanced notice of proposed rulemaking to establish a competitive bidding process and other policies confirm that BLM intends to establish such a rule. 76 Fed. Reg. 81,906 (Dec. 29, 2011). Although BLM is correct in observing, in support of the proposed rule, that Power Purchase Agreements tend to be 25-30 years, this timeframe does not take into account the construction or the decommissioning period for a project. An addition buffer of five to seven years should be built into the ROW grant period to account for these activities.

VIII. DOE REQUIREMENTS

The Programmatic Guidance in DOE's portion of the SDPEIS, similar to BLM's variance process, reads like a set of requirements—not guidance. Requirements to avoid de-shrubbing, avoid siting projects on prime or unique farmland, use technology that will minimize land disturbance, and avoid locations that would involve impacts on surface water bodies, ephemeral washes, playas and natural drainage areas are neither realistic nor required, and may be inconsistent with BLM practices. The Final PEIS should make clear that these components of the Guidance are intended to be just that—guidance, not rules.

IX. MISCELLANEOUS ISSUES

The following miscellaneous issues also warrant comment:

- As noted in the introduction to this letter, BLM appears to have abandoned the possibility that the PEIS would result in a zones-only development program. To the extent that a SEZ-only option is still a possibility, the Solar Industry strongly objects for all of the reasons given in its May 2, 2011 comment letter.

- The Pending Projects list in Appendix A is under- and potentially over-inclusive. As noted above, we strongly recommend that BLM winnow out speculative applications filed by companies that do not intend to develop facilities. In addition, however, we have identified several projects that meet BLM's definition of "pending project" that are missing from the list. Applications that need to be added to Appendix A include:

    1. CACA-049421 (Customer: Solar Partners V, LLC; received by BLM April 27, 2002; acres: 13,920)

    2. CACA-051967 (Customer: BrightSource Energy; received by BLM May 12, 2009; acres: 12,269)

    3. NVN-090476 (Customer: BrightSource Energy; received by BLM January 21, 2011; acres: 15,190)

    4. CACA-053138 (Customer: BrightSource Energy; received by BLM February 14, 2011; acres: 3,054)

    5. CACA-50390 (Customer: SolarReserve; filed August 22, 2008 [second in line application]; SolarReserve notified of status as a first in-line application on May 16, 2011; acres: 8,160)

    6. Sandy Valley III (NVN-[# TBD]) (Customer: Sandy Valley Solar III, LLC; received by BLM October 21, 2011; acres: 10,804)

    7. NextEra Sandy Valley (NVN-[# TBD]) (Customer: Boulevard Associates; received by BLM October 21, 2011; acres: 3,200)

  In addition to the applications identified above, BLM should review its records and update Appendix A to include all of the projects that meet the definition of "pending project" provided on pages 1-9 and 1-10. BLM should also review the information provided for applications on the list, as some solar companies identified discrepancies between the information in Appendix A and what they know to be true.

- Significant data gaps remain in the SDPEIS; BLM has stated that these gaps will be filled in the Final PEIS. This approach will deny public participants the opportunity to comment on significant matters where developer input in particular would be useful.[33] Assuming that a Final PEIS is the next step in this process, we strongly urge BLM to allow a minimum 60-day comment period on

[33] *See* SDPEIS at p. 2-19 ("A final proposal for SEZ-specific design features will be presented in the Final Solar PEIS."); *id* at p. 2-24 ("[I]nitial regional mitigation plans", which "will consider the cumulative impacts of development within a SEZ as well as ongoing conservation planning priorities", "will be presented in the Final Solar PEIS."), *id* at p. C-1 (recognizing that "[s]ome of the items identified in the action plans" ["plans that describe data gaps for individual SEZs and propose data sources and methods for the collection of additional data"] "will be completed by the BLM and presented in the Final Solar PEIS."); *id* at p. C-339 ("The planning-level inventory of water resources will be presented in the Final Solar PEIS."); *id* at p. C-44 (additional inventory and mitigation for vegetation resources); *id* at p. C-49 (additional inventory, avoidance, and mitigation requirements); *id* at p. C-49 (additional Key Observation Points ("KOPs")).

the final document, which would be consistent with the extra FEIS comment periods that BLM has allowed on project-specific EISs.

- On page 2-13, the SDPEIS states that "Transfers other than assignments must be approved by the BLM and may result in requirements for submittal of a new application or a Notice of Termination." BLM should provide clarity regarding the types of transfers, other than an assignment, to which this restriction is intended to apply. In particular, it is unclear whether BLM intends to impose an approval requirement when a new parent company purchases a subsidiary grant holder. Once rights are vested in a granted ROW, BLM should not interfere.

- The analysis of several SEZs concludes that a disproportionate impact on minority and low-income populations could occur whenever such populations are within 50 miles of a SEZ boundary. (*See, e.g.*, SDPEIS at p. C-22.) However, the SDPEIS does not explain the basis for or the relevance of this radius, or the relevant resources (air, visual, traffic) that might be involved in these impacts. This information should be included in the Final PEIS.

- Section C.2.2.4 places a new "Wilderness Characteristic" designation on approximately 11,925 acres in the heart of the Riverside East SEZ based on a 2011 update of the inventory of wilderness characteristics in the areas of the McCoy Mountains. (SPDEIS at p. C-60 (figure C.2.2-3).) On page C-76, the SDPEIS states that as a consequence of this new designation, "additional analysis of the visual values of these areas may be needed to determine if adjustments to the SEZ-specific mitigation identified in the Draft Solar PEIS are warranted." If the additional visual analysis results in a conclusion that the areas should be designated as Visual Resource Management ("VRM") Class II or III consistent (a conclusion that we would strongly disagree with), stringent and prohibitively costly visual resource mitigation requirements could apply to this area (in general and pursuant to the terms of the SDPEIS).

  The Solar Industry does not believe that the 2011 inventory that caused this new designation was conducted or interpreted properly.[34] Specifically, the wilderness characteristic designation is suspect in light of its apparent departure, without explanation, from the 2010 Visual Resources Inventory ("VRI") in the same area, which concluded that the area had VRM Class III characteristics. Even with this information in hand, the DPEIS declined to recommend that VRM classes be assigned to any of the lands within the Riverside East SEZ. (DPEIS at pp. 9.4-220 to 9.4-221.) When one considers the proximity of the area to the Blythe Airport, the recently approved Blythe Solar Power Project,[35] and the Town of Blythe, whether the lands can be deemed to embody the "naturalness[] and outstanding opportunities for either solitude or primitive

[34] There is, admittedly, no way to know for sure if the inventory was appropriate. The SDPEIS does not include the 2011 wilderness inventory or identify where it can be found. To comply with NEPA, BLM should make this document available.

[35] Currently, construction of this project is on hold while the developer attempts to re-permit the project to accommodate a change in technology. However, the developer undertook construction activities (development of roads, installation of fencing, grading, and clearance surveys) from late 2010 to mid-2011.

and unconfined recreation" seems highly unlikely.[36] The SDPEIS does little to allay these suspicions, giving the reader very little information about the 2011 wilderness characteristics inventory and observing only that the 2011 inventory and a 2010 VRI "reached somewhat different conclusions concerning visual resource values on the eastern side of the McCoy Mountains and the western face of the Big Maria Mountains." (SDPEIS at C-76.) This vague statement does not demonstrate to the public that BLM has fully considered its decision on this issue, nor does it provide the public with the necessary information to understand the wilderness characteristics decision.[37]

Significantly, even if BLM has properly characterized the area as having wilderness characteristics, BLM's policy documents require further analysis before it can consider the wilderness characteristics in a land use plan decision. Specifically, BLM must "[c]onsider and document the extent to which other resource values and uses of lands with wilderness characteristics would be forgone or adversely affected if the wilderness characteristics are protected."[38] Given the significant solar resources in the East Riverside SEZ, the national commitment to the development of solar energy on public lands, and the environmental benefits of clean solar energy, it seems likely that the calculus would favor solar development in this particular area.

- Certain design requirements are based on outdated and incorrect assumptions about technologies. Rather than impose hard and fast rules, the PEIS should simply require that the NEPA process take into account the following requirements:

    - Height Restrictions. Rather than a 100 foot limit in areas listed for meeting VRM Class II and III-consistent management objectives, or prohibiting power towers specifically (De Tilla Gulch, Fourmile East, and Gillespie), visual impacts should be assessed on a case-by-case basis. (*See* Attachment A, Item No. 16.)

    - Water Monitoring Requirements. Rather than require "less detailed analyses . . . for photovoltaic [PV] facilities and more detailed analysis for higher water use parabolic trough facilities", additional monitoring requirements should be imposed only on wet cooling projects or not at all. (*See* SDPEIS at p. C-343.)

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[36] BLM Instruction Memorandum No. 2011-154 (July 25, 2011) (Attach. 1 at pp. 4-8, available at http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/im_attachments/2011.Par.27443.File.dat/IM2011-154_att1.pdf.

[37] In addition, BLM has not explained the impact of the heavily mined McCoy Mountains, which were identified as Class IV lands in the 2010 VRI. This area boarders the proposed wilderness characteristics area, not far from the western boarder of the SEZ in the area impacted by the proposed wilderness characteristics designation.

[38] BLM Instruction Memorandum No. 2011-154 (July 25, 2011) (Attach. 2 at p. 2, available at http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/im_attachments/2011.Par.28612.File.dat/IM2011-154_att2.pdf).

- Footnote 1 on page 1-5 cites BLM's Land Use Planning Handbook, H-1601-1 (2005)[39] for the proposition that "A variance area is an area to be avoided that may be available for a solar energy right-of-way (ROW) with special stipulations or considerations . . . ." While the Solar Industry would agree that a variance area is an area that may be available for development, it cannot be, and is not, simultaneously an area to be avoided. Indeed, the language in the BLM Handbook actually states that "Right-of-way avoidance areas" are "areas to be avoided but may be available for location of right-of-ways with special stipulations" and distinguishes these areas from exclusion areas, which are "areas which are not available for location of right-of-ways under any conditions . . . ." (*Id.* at App. C, p. 21.) The SDPEIS simply uses the wrong construct to describe variance areas.

X. CONCLUSION

In his State of the Union address, President Obama recognized that while the differences in Congress "may be too deep right now to pass a comprehensive plan to fight climate change", the Administration still has powerful tools of its own for addressing this all-important issue; specifically, its authority to manage the nation's public lands. President Obama announced his intent to direct his Administration to make public lands available for the development of clean energy and more generally spoke of his aspirations for "a future where we're in control of our own energy." SEIA and LSA believe that DOI, BLM, and DOE have already done great work in furtherance of the President's agenda and hope that the President's words provide encouragement to the Departments to continue to devote resources to this lengthy, but extremely worthwhile, planning process.

However, the PEIS still requires work to get to a point where it will provide developers with meaningful and viable development opportunities in the short and long term. As part of this work, we urge the Departments to implement the changes described in this letter. These changes are critical if we are to ensure that the PEIS is more defensible and better designed to accomplish its purposes, and further ensure that it will not arrest the progress of the Solar Industry, which plays a crucial role in the Administration's plan to use public lands to generate clean energy.

Thank you for your time and consideration.

Sincerely,

Peter H. Weiner
of PAUL HASTINGS LLP

Jill E.C. Yung
of PAUL HASTINGS LLP

on behalf of the SOLAR ENERGY INDUSTRIES ASSOCIATION
and the LARGE-SCALE SOLAR ASSOCIATION

Attachment A: Supplemental Draft Solar PEIS – Comments on Appendix C
Attachment B: May 2, 2011 Industry Comment Letter on the DPEIS

[39] Available at http://www.blm.gov/pgdata/etc/medialib/blm/ak/aktest/planning/planning_general.Par.65225.File.dat/blm_lup_handbook.pdf.

Attachment A

Supplemental Draft Solar PEIS –
Comments on Appendix C

Supplemental Draft Solar PEIS – Comments on Appendix C
(Action Plans for Solar Energy Zones to Be Carried Forward)

Ref. #	Page	Text	Comment
1	General Comment	Various text throughout Appendix C.	The lists of "Potential adverse impacts identified in the Draft Solar PEIS" for each SEZ include many of the same elements found under the same heading in the discussions in Appendix B of areas that will be dropped from further consideration for SEZ designation. In light of this overlap, the line between potential impacts that warrant dropping or restricting development within a SEZ is not clear.
2	General Comment	The potential impacts section for several SEZs notes that "Minority populations occur within a 50-mi (80-km) radius of the proposed SEZ boundary; thus adverse impacts of solar development could disproportionately affect minority and low-income populations." (*See, e.g.* C-22; C-169.)	Stated in this way, the observations about potential impacts on minority populations are unhelpful. The PEIS fails to identify what resources (air, visual, transportation) might be impacted by solar development in a way that could have consequences for neighboring minority communities. The PEIS also does not explain the significance of the radius considered or conclude that the same radius is relevant regardless of the resource impacted. The Final PEIS should clarify these matters and identify the size of the population that might be impacted.
3	General Comment	Section 368 energy corridors might interfere with development in SEZs. (*See, e.g.*, C-37 (Imperial East; "A designated Section 368 energy corridor covers about 80% of the SEZ, potentially leaving less than 1,000 acres (4 km^2) available for solar development."); C-57 (Riverside East; same); C-98 (De Tilla Gulch; "A U.S. Department of the Interior Bureau of Land Management (BLM)-designated transmission corridor covers about two-thirds of the SEZ and could limit development in the SEZ because solar facilities cannot be constructed under transmission lines."); C-113 (Fourmile East; same).)	The impacts of Section 368 energy corridors on the total acreage in SEZs needs to be taken into account and transparently presented to the public. BLM should comment on the likelihood of approval for the development of generation facilities in these areas.
4	General Comment	Significant data gaps remain in the SDPEIS and BLM has stated that these gaps will be filled in the FPEIS. (*See* C-1 (recognizing that "[s]ome of the items identified in the action plans" ["plans that describe data gaps for individual SEZs and propose data sources and methods for the collection of additional data"] "will be completed by the BLM and presented in the Final Solar PEIS."); C-339 ("The planning-level inventory of water resources will be presented in the Final Solar PEIS."); C-44 (additional	This approach will deny public participants the opportunity to comment on significant matters where developer input in particular would be useful. To the extent that BLM intends to impose further restrictions on SEZs or new design criteria, BLM should provide a comment period on the FPEIS to ensure that stakeholders have an opportunity to correct any mistaken assumptions and conclusions.

Ref. #	Page	Text	Comment
		inventory and mitigation for vegetation resources); C-49 (additional inventory, avoidance, and mitigation requirements); C-49 (additional KOPs))	
5	C-22 to C-23 Gillespie SEZ	To reduce the visual resource impacts on this area and on Agua Caliente Road from solar development within the SEZ, allowable solar technologies within the SEZ will be limited to photovoltaic systems with height of panels no greater than 10 ft (3.3 m), or technologies with comparable or lower heights and reflectivity.	The SDPEIS imposes this condition despite the fact that "the SEZ Is in an area of low scenic quality . . . ." The conclusion in the SDPEIS that "weak to strong visual contrasts could be observed by visitors to Signal Peak WA, Woolsey Peak 25 WA, and Saddle Mountain SRMA, and travelers on the Agua Caliente Road, 26 Salome Highway and Old U.S. 80" is unhelpful, as it obscures the actual conditions of concern. Are the visual contrasts strong or weak? The evaluation of the resource should be made more internally consistent. (Please see the body of the comment letter for recommendations regarding the height restrictions proposed in the SDPEIS.)
6	C-22 Gillespie SEZ	The SDPEIS concludes that "The potential for impacts on significant paleontological and cultural resources is unknown. Impacts on cultural resources are also possible in areas related to the assumed access road."	Where impacts are possible simply because they are unknown, the PEIS should state only that they are unknown. The conclusion that impacts "are possible" suggests that some evidence points to this possibility.
7	C-53 Riverside East SEZ	"Solar development in the western portion of the SEZ would likely create conflict with existing residential use near Desert Center, Lake Tamarisk Resort, and scattered private residences."	The final Solar PEIS should address the number of residences that might be affected so that developers can use this information to better assess potential impacts of development.
8	C-56 Riverside East SEZ	"Concerns have been expressed in the past over the Salt Song Trail, and solar development within the SEZ is likely to be visible from the trail. Additional features of potential concern include Big Maria, Coxcomb, and Eagle Mountains, Alligator Rock, Black Rock, and McCoy Springs. The Soboba Band of Luiseno Indians and the Quechan have expressed concern over highly sensitive areas within their Tribal Traditional Use Areas."	While these concerns have been raised, the Salt Song Trail, to our knowledge, has not been definitively mapped and current uses have not been documented. To the extent that BLM intends to require developers to take the existence of the trail into account, developers must, at a minimum, know where it is. More generally, BLM should provide some guidance for how it intends to handle incidental impacts on the experience of those utilizing tribal resources near (visible from) potential sites for solar generation facilities.
9	C-58 Riverside East SEZ	"All forms of development within the area identified as needing to meet Visual Resource Management (VRM) Class II-consistent objectives in the Draft Solar PEIS will be limited to 10 ft (3.3 m) or under, and technology will be restricted to either photovoltaic technologies of less than 10 ft (3.3 m), or technologies with comparable or lower height and reflectivity. Within the area of the SEZ that was identified as needing to meet VRM Class III-consistent objectives in the Draft Solar PEIS, the solar development	The current height and technology limitations are excessive, as they would exclude even efficient PV technologies (*e.g.*, PV with trackers) and thereby provide perverse incentives to increase project footprints. Furthermore, the presumption that taller technologies will have greater impacts on visual resources is questionable. Any decision to allow solar development will create some visual contrasts from some vantage point. From a distance or from an elevated position, however, the impact of 10 ft panels on visual resources will not be appreciably different from the

Ref. #	Page	Text	Comment
		will be restricted to either PV technologies of less than 10 ft (3.3 m), or technologies with comparable or lower heights and reflectivity."	impacts of 20 ft panels or troughs. The 10 ft height limit and PV-only limitations on more than 25% of the SEZ acreage should be eliminated, with visual considerations applied only on a case-by-case basis to mitigate actual visual impacts exacerbated by project height.
10	C-83 Antonio Southeast SEZ	"On the western side of the SEZ that was labeled to meet VRM Class II-consistent objectives in the Draft Solar PEIS, all forms of development will be limited to 10 ft (3.3 m) or under, and the technology will be restricted to either photovoltaic technologies of less than 10 ft (3.3 m), or technologies with comparable or lower height and reflectivity. Within the area of the SEZ that was labeled to meet VRM Class III-consistent objectives in the Draft Solar PEIS, the solar development will be restricted to either PV technologies of less than 10 ft (3.3 m) or technologies with comparable or lower height and reflectivity."	See comment no. 9.
11	C-102 De Tilla Gulch SEZ	"The . . . SEZ area is 1,064 acres (4.3 km^2)."	This area is not nearly large enough to constitute a SEZ. Whether this area could support more than one project is questionable. Each project would need to be well under 100MW. Although we do not want to discourage BLM from making appropriate lands available for solar development, we would like to encourage BLM to focus the resources available for future SEZ development projects on options that create more substantial opportunities for development.
12	C-151 Amargosa Valley SEZ	"On the basis of the water impact analysis provided in the Draft Solar PEIS, development within the remaining area of the SEZ may need to be restricted to PV technology or a technology with equivalent or lower water use. Updated analyses taking the revised SEZ boundaries into consideration will be included in the Final Solar PEIS."	Technology limitations are inappropriate. To the extent that water impacts are a concern, the PEIS should place limits on the amount of water that can be used and leave it to the developers to determine whether they can construct or operate within those limits (or, alternatively, secure replacement water).
13	C-243 Afton SEZ	"On the basis of the water impact analysis provided in the Draft Solar PEIS, development within the remaining area of the SEZ may need to be restricted to PV technology or a technology with equivalent or lower water use. Updated analyses taking the revised SEZ boundaries into consideration will be included in the Final Solar PEIS."	See comment no. 12.
14	C-339 Transmission	"An important finding from the SLT analysis is that there appears to be spare capacity available in the existing 500-	This assertion is not true. The error appears to be the result of the omission of a power flow analysis. The most recent, definitive analysis of

Ref. #	Page	Text	Comment
	Analysis	kV network linking the proposed Brenda SEZ to major load areas and potential solar energy markets."	solar renewable development in Arizona showed the need for major upgrades. (*See, e.g.*, Arizona Corporation Commission's recently sponsored study on Renewable Energy Export, 11/1/2011, which concluded that Palo Verde (Delaney) to Colorado River and North Gila to Imperial Valley 500 kV lines were both needed to accommodate increase renewable generation in the state.) The model should be modified to consider "parallel" or loop flow (power from a source to sink will travel on multiple paths); include contingency considerations (contingency coverage requirements that give the appearance that a line has room because that is the case under normal conditions); and account for queue considerations and how to reserve transmission for projects in zones. Alternatively, BLM could turn over its priority projects to WECC/TEPCC and other regional planning entities (e.g., SWAT, CTPG, and CAISO) for analysis in annual planning proceedings.
15	C-343 Groundwater Analysis	The SDPEIS proposes to require "less detailed analyses . . . for photovoltaic [PV] facilities and more detailed analysis for higher water use parabolic trough facilities . . . ."	Additional monitoring requirements should be imposed only on wet cooling projects or not at all. There is no reason to require that certain CSP projects increase their monitoring above the requirements applicable to PV projects. Even presuming that all PV projects will use less water than all CSP projects, more water use does not make a project more likely to violate water use restrictions imposed by the ROW grant and NEPA documents.
16	C-344 Visual Resource Design Features	"No vertical development over 100 ft (30.5 m), including transmission towers and other structures."	Along the same lines as the comments on 10 foot height restrictions and PV only areas, BLM should consider on a case-by-case basis the impact of facility height on visual resources. Actual visual impacts can be significantly affected by site-specific considerations. While it is appropriate for the PEIS to offer a tool box of solutions for mitigating visual impacts (e.g., color treatments), it is not appropriate to bar the use of particular technologies across large areas.

Attachment B

May 2, 2011
Industry Comment Letter
on the DPEIS

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May 2, 2011 76145.00002

VIA OVERNIGHT UPS & INTERNET

Solar Energy PEIS
Argonne National Laboratory
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Argonne, IL 60439

Re: Comments of LSA, CEERT and SEIA on Draft Solar PEIS

To whom it may concern:

We live at a time of unique opportunity. Solar energy developers, conservation organizations, utilities, and all levels of Federal and State governments have united as never before to address our need for environmentally responsible clean energy. That need must be met in part through the development of utility-scale solar energy, and reasonable standards must be put into place to encourage that development. Every step we take will be watched by those who come after us.

In that spirit of urgent necessity and collaborative problem-solving, we offer the following comments on behalf of the Large-scale Solar Association (LSA), the Center for Energy Efficiency and Renewable Technologies (CEERT), and the Solar Energy Industries Association (SEIA) on the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (Draft PEIS), published by the Bureau of Land Management (BLM) and the U.S. Department of Energy (DOE) on December 17, 2010. These comments have been submitted via overnight UPS and the form at http://solareis.anl.gov/involve/comments/index.cfm.

LSA and SEIA are coalitions of solar companies. CEERT is a coalition of renewable energy companies and environmental organizations. All three seek to promote the environmentally responsible development of solar energy and associated transmission. LSA, CEERT, and SEIA are committed to working with the Departments of the Interior (DOI), Energy (DOE), and other federal agencies, environmental and conservation organizations, Native American tribes, state agencies, and other stakeholders to achieve this goal.

The PEIS represents an unprecedented and commendable effort to promote the responsible development of utility-scale solar energy, which will be key to securing our nation's energy independence and reducing greenhouse gas emissions. In particular, the PEIS will guide the development of utility-scale solar projects on BLM-managed lands for

the foreseeable future, as well as establish programmatic environmental guidance for evaluating utility-scale solar projects for DOE's financing decisions. However, unlike some other planning efforts, because BLM and DOE are preparing the PEIS at a time when solar power projects on public lands are being (and must be) developed, the PEIS must adapt to and account for these existing realities. Planning for the future without supporting current efforts could result in a net loss of solar energy development.

As we explain further below, the goals of the PEIS are salutary. BLM's recent Instruction Memoranda regarding screening criteria, due diligence, and NEPA review[1] also further the universal goal of providing direction and clarity to developers trying to site utility-scale solar projects on public lands, such as by identifying high-conflict areas and eliminating speculative applications.

However, the Draft PEIS needs much more work to make it a useful tool that (a) ensures that developers are able to maintain their forward momentum with existing applications, and (b) establishes a roadmap for environmentally responsible and technically and economically feasible utility-scale solar siting and permitting over the long-term. That program should facilitate environmentally-responsible permitting.

Our comments can be summarized very briefly as follows:

1. BLM should continue to process existing applications. BLM should reject applications that are in high-conflict areas (as defined below in Section II.A) *and* do not have a Notice of Intent when BLM and DOE issue a Record of Decision (ROD) for the Final PEIS. (Applications already far along in the NEPA process will be resolved through that process.) BLM should process the remaining applications according to the criteria set forth in BLM's February 7, 2011 Instruction Memorandum.[2] These combined criteria are sufficient to prioritize and reject projects, as appropriate.

2. BLM should not adopt the Solar Energy Zone (SEZ)-only alternative analyzed in the Draft PEIS. The SEZs suffer from the problems identified above and below, fail to sufficiently address the nation's urgent need to reduce greenhouse gas emissions, and provide little or no added environmental benefit over alternatives that provide more flexibility. Because the SEZ-only alternative does not fulfill the purpose and need of the PEIS, comply with applicable laws and mandates, and has not been adequately analyzed, it is not legally defensible.

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[1] *See* IM No. 2011-059, National Environmental Policy Act Compliance for Utility-Scale Renewable Energy Right-of-Way Authorizations (Feb. 7, 2011); IM No. 2011-060, Solar and Wind Energy Applications – Due Diligence (Feb. 7, 2011); IM No. 2011-061, Solar and Wind Energy Applications - Pre-Application and Screening (Feb. 7, 2011).

[2] IM No. 2011-061, Solar and Wind Energy Applications - Pre-Application and Screening (Feb. 7, 2011).

3. BLM should take action to eliminate speculative applications. Specifically, BLM should subject all existing applications, as of the date of the Final PEIS, to the technical and financial screening criteria in BLM's February 7, 2011 Instruction Memorandum.[3] This will ensure that all viable projects can proceed to a Notice of Intent within a reasonable period of time and that any non-viable projects will be eliminated.

4. Limiting applications to the currently proposed SEZs after a certain date does not make sense because they are already insufficient and will be subject to additional culling in the next phase of environmental review. The currently proposed SEZs will be reduced in number and acreage in the Final PEIS for a variety of reasons (e.g. visual impacts and wildlife corridors). The SEZs that are near load and transmission already are full with applications; there is little or no space for new applications. A date cutoff would serve as a two- to three-year moratorium while BLM identifies, studies, and designates new areas for development. Although utility-scale solar development is also occurring on private lands where available, the utility-scale solar industry will fail if there is a moratorium on new development on public lands. There must be some acceptance of new applications (other than in high conflict areas) outside of the currently proposed SEZs.

5. The proposed SEZs in the Draft PEISs are inadequate. The SEZs are not sufficiently close to load or transmission; they have not been studied to assure that conflicts are low and development prospects are high; they are too few and too small; and they do not provide real incentives for development within their boundaries. Stated positively, BLM should propose and designate SEZs based on technical criteria (insolation, slope); known, low conflicts with biological, cultural, and other resources; and known access to transmission and proximity to load. SEZs would provide real incentives for development within their boundaries, such as project-specific Environmental Assessments (EAs) instead of EISs and assurance of transmission interconnection. BLM should also work with the Federal Energy Regulatory Commission (FERC) to encourage expedited deployment of new or upgraded transmission facilities serving SEZs. SEZs also would be large enough to allow for siting flexibility, and BLM would establish a clear process for expanding SEZs and adding new ones.

6. BLM should not adopt its proposed non-environmental exclusions as currently mapped. The excluded areas (in pink on maps provided in the PEIS) are overly broad, include some existing viable applications, do not have an evidentiary basis for their exclusion, and are not explained transparently in the document. Further work is necessary to understand and discuss which lands should be excluded. Specifically, the non-environmental exclusion criteria need to be modified.

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[3] *Id.*

7. BLM should subject new project applications (i.e., those filed after BLM and DOE issue the PEIS ROD) to the agreed upon screening criteria that BLM adopts in the ROD.

8. BLM should determine the criteria for additional SEZs, and specify conditions under which it would restrict new applications outside of SEZs. There are a number of circumstances under which extra-SEZ applications will make sense. These include applications where adjacent private land, combined with non-SEZ federal land, provides sufficient acreage for a project, where the inclusion of federal land adjacent to a SEZ would avoid unacceptable impacts in the SEZ or where the land outside the SEZ is determined to have fewer conflicts. When BLM provides well-crafted incentives for well-sited SEZs, these incentives will steer most development within the SEZs. All new applications that are not in high conflict areas should be timely processed.

In setting forth our recommendations for improvements to the PEIS, we are cognizant of BLM's and DOE's staffing and resource constraints. The industry is ready to assist BLM and DOE with ensuring that they have the resources they need to effectively perform the many tasks before them. However, we urge the agencies to ensure that no resources are re-allocated away from the processing of existing solar energy development applications. Such action would strain existing investments and likely would cause capital currently devoted to solar energy projects to be shifted into other investments. This shift would adversely affect the solar energy industry and undermine critical efforts to meet renewable energy goals and mandates.

I. Background

On May 29, 2008, DOE and BLM published in the Federal Register a Notice of Intent to prepare the Solar Energy PEIS to develop and implement agency-specific solar energy development programs and to evaluate solar energy development on BLM-administered public lands. *See* 73 Fed. Reg. 30,908 (May 29, 2008); *see also* 74 Fed. Reg. 31,307 (June 30, 2009) (announcing BLM's intention to designate SEZs as part of PEIS process).

The goals of the PEIS are to "create a more efficient process for authorizing solar energy development on public lands." 74 Fed. Reg. at 31,308. This process also is intended to:

- *Facilitate* near-term utility-scale solar energy development on public lands;
- *Minimize* potential environmental, social, and economic impacts;
- Provide the solar industry *flexibility* in proposing and developing solar energy projects (location, facility size, technology, etc.);
- Optimize existing *transmission* infrastructure and corridors; and

- *Standardize* the authorization process for solar energy development on BLM-administered lands.

Draft PEIS at ES-3; 74 Fed. Reg. at 31,308. As stated in more detail in our comments below, we are concerned that the Draft PEIS does not meet these intended goals because it:

- Does not *facilitate* development due to its failure to propose sufficient SEZs near load and transmission and its failure to sufficiently analyze biological and cultural constraints within the proposed SEZs;

- Does not avoid or *minimize* environmental and cultural impacts due to its failure to analyze these impacts prior to determining SEZ boundaries and locations;

- Would not provide *flexibility* under the SEZ-only alternative and would appear to constrain flexibility arbitrarily under some of the Preferred Alternative maps, unless further explanations are forthcoming;

- Does not optimize existing *transmission* infrastructure because of inadequate study of transmission as related to SEZs and to projected development on private lands; and

- Does not *standardize* the authorization process or streamline the environmental review process for projects on public lands because so much analysis is left for individual projects.

We appreciate the monumental efforts that have gone into preparing the Draft PEIS. However, these and the other issues we discuss below must be addressed if the Final PEIS is to be as useful as it can and needs to be.

Finally, we recognize the difficulty of writing a long-term planning document at the same time that the agency and all stakeholders are engaged in intensive short-term decision-making regarding the same lands, technologies, and resources that are addressed in the PEIS. In some states, such as California, other long-term planning activities such as the Desert Renewable Energy Conservation Plan (DRECP) should further inform BLM's planning. The solar industry would be severely handicapped to the detriment of the public and all stakeholders if these current activities are not accounted for and prioritized. Our comments and suggestions are designed to provide a roadmap for developing a long-term and sustainable siting and permitting program while giving due attention to existing project applications.

II. Comments on the Draft PEIS (BLM)

A. BLM should commit to the timely processing of existing applications.

The Draft PEIS states that pending "applications are being processed in accordance with the BLM's current Solar Energy Policies (BLM 2007, 2010a,b)." The PEIS also cites BLM's June 30, 2009 Federal Register notice (74 Fed. Reg. 31,307), in which BLM stated that:

- Any entity with an existing application for lands within the [proposed SEZs] received by the BLM prior to June 30, 2009 will continue to be processed under the BLM's current procedures.

- Applications received after June 30, 2009 for lands inside the [SEZs] will be subject to the [ROD] for the Solar PEIS and any alternative procedures developed by BLM for non-competitive and competitive processes.

- All applications received for lands outside of the [SEZs] will be processed under the BLM's current procedures.

- Any right-of-way (ROW) grant for a solar energy application issued after the BLM's ROD for the Solar PEIS may be issued subject to the requirements adopted in the ROD.

BLM should commit to processing existing applications under existing procedures and guidance (including BLM's February 7, 2011 Instruction Memoranda) in a timely manner, regardless of where the applications are located. To adequately protect biological, cultural, recreational, visual, and other resources, BLM should reject applications[4] that do not have a Notice of Intent as of the date that BLM and DOE issue the ROD for the Final PEIS, and that are in high-conflict areas, which we would define as:

- Designated critical habitat for federally threatened and/or endangered species, in accordance with the language of IM 2011-061.

- Areas of Critical Environmental Concern (ACECs) and Desert Wildlife Habitat Management Areas (DWMAs).

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[4] By "applications" we refer to applications for utility-scale solar projects, not applications for associated transmission infrastructure and linear facilities. BLM should not automatically exclude such infrastructure and facilities from areas that present high conflicts for projects, and should review and permit applications for such facilities according to standard procedures.

- Lands that have been formally proposed by federal agencies for designation as wilderness, or proposed for a national monument or wilderness designation in S.2921 (111th Congress).

- Lands that were originally part of a renewable energy ROW application and were eliminated from that application by BLM or the applicant due to resource conflicts. For example, where the final project represents a smaller or different footprint to avoid wildlife habitat, rare vegetation or desert washes, the excluded portion of the ROW should no longer be available for development. This category includes projects that BLM rejected because they were located within areas subject to a 1% development cap in applicable land use plans.

- Lands that have conservation value and were purchased with federal, state, or private funds, and donated or transferred to the BLM for conservation purposes.

- Lands purchased with federal, state or private funds, and donated or transferred to BLM expressly as mitigation for project impacts.

We raise the need to process existing applications first because it applies regardless of what the Final PEIS says. Many pending applications are far along in the environmental review and permitting process, and already have PPAs and priority in the transmission interconnection process. These projects are the most viable given their commercial value and investment, and are necessary to maintain the utility-scale solar industry's forward momentum. Those applications that are not as far along still represent substantial investment by developers and should also be processed. In addition, we urge BLM to avoid delaying or imposing new requirements on any project that is well into the NEPA process but does not have a ROD by the time BLM adopts a ROD for the Final PEIS. The critical point is that failing to timely process existing applications is the same as denying them. Put another way, the PEIS not only must provide an improved program for siting and permitting utility-scale solar projects on public lands, it must provide an immediate and reasonable path forward for the existing projects that are crucial to the industry's continued viability.

Finally, new project applications filed after BLM and DOE issue the ROD for the PEIS should be subject to the screening criteria BLM adopts in the ROD and processed according to queue position. As with existing applications, new high conflict applications outside well-sited and adequate SEZs should be rejected.

B. The proposed SEZs need substantial work if they are to be a useful component of a solar energy program for public lands.

BLM should focus on facilitating rather than restricting solar development on public lands. By carefully studying and designating SEZs, BLM can provide real incentives for developers to locate their projects within SEZs and away from areas with high conflicts.

1. Characteristics of useful SEZs

BLM would propose and designate SEZs based on the following criteria:

- *Adequate insolation and maximum slope.* In the Draft PEIS, BLM excluded lands with greater than 5% slope and/or solar insolation levels below 6.5 kWh/m^2/day. These are suitable initial thresholds, but the lands they exclude may become more attractive over the 20-year life of the PEIS.[5] BLM should allow for the designation of SEZs that include lands that do not meet these thresholds.

- *Minimal species or cultural resource conflicts.* SEZs can and should be chosen only *after* detailed studies indicate good places for development. Identifying SEZs before these studies are complete does not assist solar development or environmental or cultural resources; instead of creating "go" zones, BLM risks creating "we don't know" zones that are not effective in meeting the goals BLM has set for the PEIS. If SEZs have resource conflicts that have not been analyzed, they create the false perception that sufficient land is being provided when it is not. Based on the collective experiences of developers, we estimate that 60-90% of the proposed SEZs will turn out to be unavailable for development due to (as-yet) unknown conflicts.

- *Close to load and transmission infrastructure and capacity.* Many of the proposed SEZs face severe transmission constraints, and those that do not already are full of applications. Again, if SEZs are located far from load and transmission, they create the false perception that there is sufficient land for development.

- *Large and numerous enough to allow for flexibility and industry growth.* The Draft PEIS contemplates that additional or expanded SEZs can be proposed, evaluated, and designated, but there is no concrete process for doing that on a timeframe that is meaningful. Initial SEZs will be necessary but not sufficient, especially since many lands (especially in California) already are the subject of applications. In the Final PEIS, BLM must have a workable process in place and underway for expanding and adding SEZs.[6] We provide specific suggestions for new SEZs below.

- *Ability to support real incentives for development.* The Draft PEIS identifies potentially helpful but vague incentives to develop in SEZs. These incentives are key to

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[5] In just a few short years, many photovoltaic (PV) systems have evolved and can now utilize slopes in the 8-10% range.

[6] BLM should allow for increases in renewable portfolio standards, at least for the six states covered by the PEIS. As renewables become more prevalent, there will be incentives to export the power they generate to other states where solar resources are not as abundant.

the word "facilitated" in "Area for Facilitated Development," and they must be more concrete. For example, BLM should provide for streamlined environmental review in the form of EAs instead of EISs; provide concrete assurances that projects in SEZs will be able to connect to the grid;[7] and withdraw SEZs from other uses including mining and oil and gas development (or at least prioritize solar over those uses).[8]

Below we discuss a few of these criteria in more detail, focusing on where the proposed SEZs fall short so that BLM can develop better ones.[9]

2. The proposed SEZs require substantial additional analysis and thought if they are to be useful.

Areas in which BLM chooses to promote solar development can and should be chosen only *after* detailed biological, cultural, and transmission studies indicate that they are good places for development. Identifying SEZs before these studies are complete does not assist solar development or protect environmental or cultural resources; instead of creating "go" zones, BLM risks creating "we don't know" zones that are not effective in meeting the goals BLM has set for the PEIS. In addition, if SEZs are located far from load and transmission, or have resource conflicts that have not been analyzed, they create the false perception that sufficient land is being provided when it is not. Finally, the SEZs also need to be larger and more numerous. Much of the area of the proposed SEZs already is covered by existing applications, particularly in California, and there are no SEZs proposed in the West Mojave, Chocolate Mountains, or other high-value areas.

a. The SEZs are not informed by ground-level biological surveys or analysis or allow for the future incorporation of the DRECP.

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[7] For example, BLM could work with FERC, Independent System Operators, Public Utility Commissions (PUCs), and utilities on joint transmission planning to accomplish these results.

[8] For this reason, we support BLM's recent interim and proposed final rules to segregate lands for utility-scale solar development to prevent conflicts with new mining claims. *See* 76 Fed. Reg. 23,198 (Apr. 26, 2011) (codified at 43 C.F.R. § 2091.3-1(e); 43 C.F.R. § 2804.25(e)); 76 Fed. Reg. 23,230 (Apr. 26, 2011).

[9] Our aspiration is that BLM develops SEZs that are, in fact, areas of *facilitated* development (AFDs), with an emphasis on incentives to develop projects within zones rather than on restrictions on projects outside of zones. The characteristics we describe above—thorough biological and cultural studies, access to adequate transmission infrastructure and load, and direct development incentives—would underscore this carrot-based approach. A stick-based approach would impede solar development with little environmental benefit. *See* Section II.C below.

Key to siting utility-scale solar projects is the relative presence of sensitive species and their habitats. If the SEZs are to minimize the impacts of solar projects on these species and habitats, including habitat connectivity, and provide incentives for development within their boundaries, they must be located in areas with (a) known and (b) relatively few biological resource conflicts. BLM also must know that the ecosystems within SEZs are capable of accommodating a certain level of development (i.e., that they have adequate carrying capacity), and establish workable mitigation measures to avoid, minimize, and mitigate the impacts of that development.

BLM has not undertaken the "in-depth environmental analyses" that underlie such informed decisionmaking, and that BLM promised when it announced the solar zone concept. *See* 74 Fed. Reg. 31,307, 31,308 (June 30, 2009). Specifically, BLM has not conducted detailed, ground-level biological surveys or engaged in a detailed consultation with the U.S. Fish & Wildlife Agency (FWS) under Section 7(a)(2) of the Endangered Species Act (ESA), 16 U.S.C. §§ 1531-1544. Instead, it appears that BLM relied on existing, gross data and undertook a much less detailed consultation under Section 7(a)(1) of the ESA to generalize about biological resources, decide where to locate SEZs, and develop mitigation measures. As a result, developers still must conduct protocol-level surveys of sites proposed for development within SEZs and engage in first-in-time Section 7(a)(2) consultation with FWS—the opposite of the "streamlined environmental process" and "very limited additional environmental analysis" that the Draft PEIS promises. *See* Draft PEIS at 2-11, 6-33. Moreover, we fully expect that detailed biological surveys will reveal significant biological resources (and therefore conflicts) within much of the proposed SEZs, making that area unavailable for development. This is not a useful outcome.

Aside from biological considerations, the PEIS fails to quantify indirect impacts to lands in the SEZs, except in specifically designated areas. The PEIS does not analyze National Heritage Areas, scenic byways, un-inventoried portions of historic trails, state parks and wildlife areas, and other locally significant areas or attractions. Without this analysis, it is difficult to determine whether the SEZs will be viable since impacts to these areas could require significant mitigation.

In addition, BLM did not base its SEZ designations or energy policies and design features on the California Desert Renewable Energy Conservation Plan (DRECP). The DRECP, which is still under development, will be a Habitat Conservation Plan under the ESA and a National Communities Conservation Plan under the California Endangered Species Act (CESA), Cal. Fish & Game Code § 2050 *et seq.*, and is being developed by the Renewable Energy Action Team, of which BLM is a member. Once it is complete, the DRECP will: (a) identify and map areas for renewable energy development; (b) identify and map areas intended for long-term natural resource conservation; and (c) establish best management practices and guidance. Unless the PEIS accounts for the DRECP's final recommendations (or provides for their incorporation) regarding areas for development and conservation, as well as design features, the PEIS may not cohere with those well-

studied recommendations. *See* LSA/SEIA/CEERT SESA Comments, at 13 (Sept. 14, 2009). This is not a useful outcome.

Solution: The Final PEIS, including the designation of any SEZs, should incorporate a mechanism for adjustment of SEZ boundaries in light of the final DRECP. BLM can bolster both the DRECP and the SEZs by engaging in full Section 7(a)(2) consultation with FWS and gathering (or have FWS gather) detailed biological resource information on the acreage within designated SEZs.[10] The SEZs then can become truly noncontroversial "go" areas for solar energy projects.

If BLM cannot perform these tasks prior to finalizing the PEIS, it should expressly recognize that the designated SEZs are shells or outlines of possible development zones to be studied further, not actual development areas themselves, and should not claim that the entire area (or any percentage of it) is available for development until there is more information about these issues.[11]

b. The SEZs are not informed by ground-level cultural surveys or analysis or even landscape-level consultation under Section 106.

Equally key to siting utility-scale solar energy projects is the relative presence of cultural resources, including resources that are or may be sacred to Native American tribes. Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 370f, requires agencies to evaluate the potential impacts of their decisions on certain eligible cultural and historic resources before making those decisions.

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[10] The Draft PEIS states that, "for all proposed SEZs, government-to-government consultation and inter-agency consultation are still ongoing and could result in the identification of additional concerns." Draft PEIS at 6-33 n.7; *see also* Draft PEIS at 6-100. We are hopeful that this consultation includes ESA Section 7(a)(2) consultation with FWS.

[11] By way of further example, the Draft PEIS states that BLM used the following tools to evaluate areas for designation as SEZs: site-specific GIS; Google Earth; BLM GeoCommunicator website (BLM and USFA 2010); BLM LR 2000 system (BLM2010b); local BLM staff; BLM's 1:100,000 Surface Management Status maps; visits by assessment teams; and BLM Rangeland Administration System web site. Draft PEIS App. M at M-4 to M-7. A typical developer will usually conduct a far more in-depth investigation of a prospective site, relying on protocol-level biological and cultural surveys and detailed record reviews, investigations of onsite and offsite rainfall and natural drainage conveyances, preliminary evaluations of soil characteristics, and analyses of proximity to existing pipelines, rail unloading facilities, access roads, telephones and cell towers, industrial services, fire districts, and, of course, transmission infrastructure.

Recognizing this obligation, BLM has undertaken Section 106 consultations for individual solar energy projects. Yet BLM has not done so for the Draft PEIS.[12] A programmatic Section 106 consultation would assist BLM in evaluating the potential impacts of the PEIS on cultural resources, and in avoiding or minimizing those impacts. BLM cannot designate SEZs or develop programmatic mitigation measures without the information that such consultation would generate.

Similarly, BLM did not perform detailed surveys of cultural resources before designating SEZs, so that developers could avoid conducting, or at least minimize, such surveys.

Solution: BLM should gather detailed information about cultural resources before designating SEZs. At a minimum, BLM should conduct a programmatic Section 106 consultation for the PEIS and conduct detailed cultural resource surveys of proposed SEZs. As with biological resource studies, if BLM cannot perform these tasks prior to finalizing the PEIS, it should expressly recognize that the designated SEZs are shells or outlines of possible development zones to be studied further, not actual development areas themselves, and should not claim that the entire area (or any percentage of it) is available for development until there is more information about these issues.

c. The proposed SEZs do not facilitate development on already-disturbed private lands because BLM failed to designate SEZs near such private lands.

The Draft PEIS states that BLM tried to integrate information about private lands into the Draft but was unable to do so due to time constraints. *See* Draft PEIS at 1-14. Appendix E, for example, assumes that much, if not the majority, of near-term utility-scale solar energy development will be on private lands, but the PEIS does not locate zones to achieve synchronicity with opportunities for development on private lands. These opportunities are publicly identified through filed permit applications or designated through a state and local land use and transmission planning processes, and the PEIS must undertake this effort or refrain from drawing conclusions in the PEIS based on incomplete assessments..

The assumptions in the PEIS, which are based on the absence of critical information about, and consideration of, private lands, have three consequences. First, future transmission likely will not be planned based on the availability of and constraints associated with public *and* private lands. Federal efforts to site future transmission may be particularly susceptible to this oversight by focusing only on public lands. Second, the

[12] The Draft PEIS states that, "for all proposed SEZs, government-to-government consultation and inter-agency consultation are still ongoing and could result in the identification of additional concerns." Draft PEIS at 6-33 n.7. We are hopeful that this consultation includes Section 106 consultation with federally-recognized tribes, their designated representatives, and any other appropriate stakeholders.

SEZs are not planned to capitalize on private land opportunities, and do not optimize land use and environmental planning benefits by mixing and matching public and private lands or by being adjacent to what may become disturbed private lands as a result of solar projects located on public lands. Third, environmental impact assessment on both the public and private side of the review will not take the sum of public and private lands into account and there likely will be little effort to coordinate using public and private lands for compensatory mitigation. Many nongovernmental organizations (NGOs) and local governments favor such coordination.

Solution: Consider the addition of SEZs with these private land considerations in mind. Utility-scale solar projects proposed on private lands should be easy to identify based on pending conditional use permit applications. Specifically, if BLM previously rejected certain public lands near degraded private lands for SEZ designation because of small size, BLM should reconsider that decision in issuing the Final PEIS.

d. Many of the SEZs are in areas where utility-scale solar projects are less likely to be built because transmission access and/or proximity to load are absent.

A SEZ that lacks adequate access to existing or planned transmission is a cemetery for utility-scale solar projects. Similarly, a SEZ that is located too far from where electricity is needed may never be developed because the cost of transporting electricity to the load centers is too high. Many of the proposed SEZs suffer from one or both of these problems.

Consider the following factors, which dictate where solar developers will site their projects. First, the target development for SEZs is large projects (likely 50 MW or greater), and the market for large projects is in California (an overwhelming majority of the RPS requirement in the Western Interconnection is in California). This fact favors larger or more (or both) SEZs in California and Arizona.

Second, in areas with very large wind energy potential, the market for solar energy is constrained because of economics. Thus, for the eastern front of the Rocky Mountains (Wyoming, Colorado, New Mexico), wind projects will be favored in certain RPS markets, with minimal set asides for solar projects. California, Arizona, and Nevada may provide better markets for solar power, at least as compared to certain areas in other states.

Third, large interregional transmission lines in the West primarily were built to move baseload resources from east to west. The existing interstate transmission grid was developed and sized according to these baseload resources (usually coal-based electricity but also some nuclear and hydropower) in the east, and was designed to move this energy to the load centers in California and, to a lesser extent, Phoenix and Tucson. There may be some small spare capacity on these lines during certain times of the day and year, but

little of the firm capacity needed to service a solar facility with predictable and daily output.

Fourth, it is difficult for utility-scale solar projects to competitively support large transmission costs. A transmission system wheel[13] creates a major obstacle to a solar project's economics, and two wheels destroy it. In addition, it is difficult to economically carry large transmission costs on a resource with a 25-30% capacity factor (it is difficult enough for a baseload resource with a 90-100% capacity factor), and many power purchase agreements with the major California utilities do not allow wheeling over multiple transmission systems, thus creating an insurmountable hurdle. Finally, many existing and proposed transmission lines have capacity divided or reserved by several utilities. Some of the capacity is reserved for specific use by a utility. In the majority of cases, a project must tie into a California Independent System Operator (CAISO) interconnection point to qualify for inclusion in the California RPS. This restriction eliminates the use of many existing or proposed transmission lines for delivery of power into California.

As a result of these factors, and as developers understand, solar power is best generated as close as possible to its retail market and in areas with ready access to existing or planned transmission with adequate capacity. With the exception of the Riverside East and Imperial East SEZs in California, and in general the Arizona SEZs, BLM did not adequately account for this calculus in designating the proposed SEZs.[14]

As the table below discusses in more detail, too much total area of the proposed SEZs is too far from load, and many SEZs lack adequate transmission access. Indeed, of the 18 proposed SEZs, 5 (comprising 112,955 acres) are more than 20 miles from existing transmission, a distance past which it is often economically infeasible to build interconnection lines. Although some SEZs are in areas where new transmission capacity is proposed, developers have no certainty about when transmission lines will be built in

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[13] A transmission "wheel" is transmission service over a single transmission provider's system. To move power to a distant location, a project may need to piece together several transmission wheels, or segments. For example, a project may need to deliver electricity over a transmission line to get the terminus of a proposed major inter-regional transmission line, then over the inter-regional transmission line, then over a line from a distant terminus of the inter-regional line to a distribution station. If a single transmission provider owns all three lines, there is only one wheel; if two or three providers own those lines, there are two or three wheels.

[14] The Draft PEIS admits that, in evaluating whether to designate additional transmission corridors, BLM "only considered the locations of existing transmission lines and designated corridors and did not look at the available capacity on existing lines." Draft PEIS at 1-14. We submit that BLM did not adequately consider the locations or capacity of existing or planned transmission lines in proposing SEZs.

those corridors.[15] As for the remaining 13 SEZs, BLM has not performed any type of impact study to determine whether or not there will be capacity available on these lines.[16]

State	SEZ / BLM Field/District Office	Acres	% of Total SEZ Acres
Colorado	Antonito Southeast (La Jara/Conejos)	9,729	
	De Tilla Gulch (Saguache/Saguache)	1,522	
	Fourmile East (La Jara/Alamosa)	3,882	
	Los Mogotes East (La Jara/Conejos)	5,918	
	Total :	**21,051**	**3.1%**
New Mexico	Afton (Las Cruces/Dona Ana)	77,623	
	Mason Draw (Las Cruces/Dona Ana)	12,909	
	Red Sands (Las Cruces/Otero)	22,520	
	Total:	**113,052**	**16.7%**
Utah	Escalante Valley (Cedar City/Iron)	6,614	
	Milford Flats South (Cedar City/Beaver)	6,480	
	Wah Wah Valley (Cedar City/Beaver)	6,097	
	Total:	**19,191**	**2.8%**
	The SEZs designated in Colorado, New Mexico, and Utah collectively comprise 21.9% of the total SEZ acreage. We are skeptical that much of this land will be developed with solar energy.		
Arizona	Brenda (Lake Havasu/La Paz)	3,878	
	Bullard Wash (Hassayampa/Yavapai)	7,239	
	Gillespie (Lower Sonoran/Maricopa)	2,618	
	Total:	**13,735**	**2.0%**

[15] This concern is heightened by the recent vacatur and remand of DOE's National Interest Electric Transmission (NIETC) Corridors and associated NEPA review. *See Cal. Wilderness Coal. v. DOE*, 631 F.3d 1072 (9th Cir. 2011).

[16] We are happy to provide more detail about these constraints by meeting with BLM.

State	SEZ / BLM Field/District Office	Acres	% of Total SEZ Acres
	It is unclear why such a solar resource-rich state has the smallest percentage of SEZ-designated acres. The solar market in Arizona is emerging and there is much more potential in that state than the Draft PEIS recognizes. (Indeed, BLM recognizes that "development could be constrained in Arizona and Colorado by the amount of land available under the SEZ program alternative." Draft PEIS at 2-23.) Indeed, the Draft PEIS has just touched the surface of suitable sites in Arizona. For example, Arlington West, Dendora, Hassayampa, Harquahala, Yuma, La Paz, and sites near Palo Verde are not included. Moreover, the limited amount of reconnaissance performed for the existing recommended sites on biological and cultural resources will leave the proposed SEZs open to duplicative and costly analysis. Supplemental locations, along with the existing locations, should be studied more carefully. In addition, the selection of SEZs should reflect the existing lines that will interface with known reconductoring for increased capacity.		
Nevada	Amargosa Valley (Southern Nevada/Nye)	31,625	
	Delamar Valley (Ely/Lincoln)	16,552	
	Dry Lake (Southern Nevada/Clark)	15,649	
	Dry Lake Valley North (Ely/Lincoln)	76,874	
	East Mormon Mountain (Ely/Lincoln)	8,968	
	Gold Point (Battle Mountain/Esmeralda)	4,810	
	Millers (Battle Mountain/Esmeralda)	16,787	
	Total:	**171,265**	**25.3%**
	Nevada is a relatively small market, but it has significant potential. BLM manages roughly 68% of the land within Nevada's boundaries and yet the Draft PEIS proposes to make very little of that land available for solar development under the Preferred Alternative (only a miniscule amount would be available under the SEZ Alternative), including areas in Clarke and Nye Counties. In addition, there is a disconnect between new generation capacity and transmission projects proposed for southern Nevada and the destination for the electricity those projects would generate and carry. Additional SEZs would address these two concerns.		
California	Imperial East (El Centro/Imperial)	5,722	
	Iron Mountain (Needles/San Bernardino)	106,522	

State	SEZ / BLM Field/District Office	Acres	% of Total SEZ Acres
	Pisgah (Barstow/San Bernardino)	23,950	
	Riverside East (Palm Springs/Riverside)	202,896	
	Total:	**339,090**	**50.1%**
	The most promising proposed SEZ is the Riverside East SEZ, which already has seen significant development interest. However, we understand that BLM will sharply reduce the developable acreage in this SEZ because of visual and wildlife corridor concerns. Iron Mountain is remote from any significant transmission. Iron Mountain also is of concern to the conservation community. The Pisgah SEZ has suitable planned transmission access but portions of the SEZ have biological resources which create high litigation risk, limiting the prospects for development that could utilize the planned transmission. As a practical matter, we believe that Iron Mountain should be removed from the SEZ list, not count toward needed acreage, and be replaced by other SEZs in California.		

In sum, too few of the proposed SEZs are in California and Arizona, where the load centers are. In addition, many of the proposed SEZs lack adequate access to transmission and/or have other constraints that would threaten their utility as useful development zones. *See* Section II.B.6 below (recommending that additional zones be developed in promising areas).

Solution: Re-evaluate potential SEZs to better account for proximity to load centers and transmission access. BLM should consult with the CAISO, as well as other transmission authorities, to generate better assessments of transmission proximity and capacity, and factor those assessments into any SEZ designations. Again, BLM should also work with the FERC to encourage expedited deployment of new or upgraded transmission facilities to serve SEZs.

e. A significant portion of the total zoned acreage within California is in areas that are controversial.

As the table above makes clear, nearly 130,000 acres (20%) of the proposed California SEZs are in two SEZs (Iron Mountain and Pisgah), portions of which have important biological resources. Conservation organizations have sharply opposed Iron Mountain and some have also opposed Pisgah. As a practical matter, we believe that the Iron Mountain SEZ should be eliminated given its distance from transmission and resource conflicts. For these reasons, it is imperative that other California SEZs be studied and designated in the very near term. Our concern with the PEIS is that BLM may "declare victory and leave" the field, leaving inadequate SEZs and a perception that siting issues have been resolved.

Solution: Remove Iron Mountain from the SEZ list and designate new SEZs in California to replace it. See Section II.B.6 below (proposing specific areas for further study as SEZs).

f. The SEZs need to be larger and more numerous.

(i) Many of the proposed SEZs, particularly in California, already are the subject of pending applications.

According to data obtained from BLM public database for California,[17] of the 339,090 acres currently proposed as SEZs, pending ROW applications already cover 108,864 acres. These applications reduce the supposed 677,384 acres available under the SEZs by 16% overall and by 32% in California. *See* Figure 1 and Table 1 below.

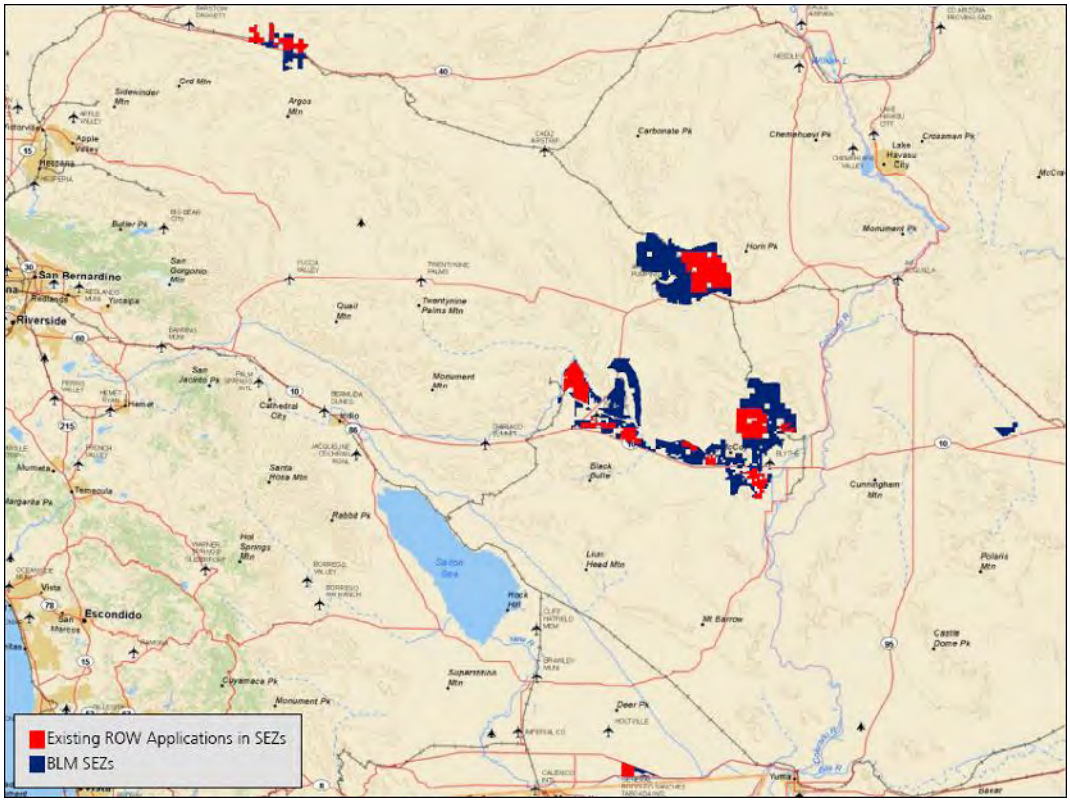

Figure 1. Existing ROW applications in proposed California SEZs.

[17] BLM, RenewEnergyROW (shape file) (available at ftp://ftp.blm.gov/pub/CA/gis/ca_sync/geodatabasesZIP (last visited Mar. 10, 2011)).

Proposed SEZ	Acreage of SEZ	Existing ROW Acreage	Proposed SEZ	Acreage of SEZ	Existing ROW Acreage
Imperial East			Riverside East		
SolarReserve		3,822	Cuckwalla Solar 1		4,090
Total	5,722	3,822	Palen Solar I, LLC		5,080
Iron Mountain			Desert Sunlight Holdings, LLC		14,800
Leopold Companies- Ward Valley		35,304	Ridgeline Energy, LLC		1,820
Total	106,522	35,304	enXco-McCoy		12,830
Pisgah			enXco-Eagle Mountain Soleil		1,055
enXco TroyLake Solar		3,532	FPL Energy-McCoy		7,040
enXco Caboose		3,518	enXco-Mule Mountain		1,990
Calico Solar, LLC-Calico		4,488	Genesis Solar, LLC-Genesis Solar		1,950
Total	23,950	11,538	First Solar-Desert Quartzite		7,290
			Ridgeline Energy-Desert Center II		255
			Total	202,896	58,200
			Total	339,090	108,864

Table 1. Acreages of proposed SEZs in California vs. Acreage of existing ROW applications in SEZs.

(ii) BLM should evaluate and propose SEZs within the West Mojave and the Chocolate Mountains of California, and additional SEZs in Nevada and/or Arizona.

The Draft PEIS does not propose designating any SEZs in the West Mojave and/or the Chocolate Mountains. Yet the West Mojave region in Eastern Kern County and West San Bernardino County, along with parts of the counties of Inyo and Los Angeles, is considered by many to be the most important and valuable solar resource area in California—and for good reason. This area is strategically located near two electric transmission corridors owned by Southern California Edison and the Los Angeles Department of Water and Power. It is also adjacent to the Tehachapi Wind resource area, which would allow complimentary development of wind and solar resources, significantly reducing integration costs.

The West Mojave region additionally offers some of the world's highest quality solar radiation levels. Because of higher elevation and clearer skies, the solar radiation levels in the West Mojave are, in some locations, more than 10% higher than in the Eastern Mojave. As a result, the amount of land needed to generate the same amount of electricity is 10% less. The quality and nature of the radiation in the West Mojave also make it the single best area for development of concentrating solar power plants within the state of California. Moreover, the area is located in between two large military installations, Edwards Air Force Base and China Lake Naval Air Weapons Station, and much of the land is disturbed and made up of many small, private parcels. The lands in the West Mojave thus offer conditions that make siting solar energy generation projects there attractive for both developers *and* environmental stakeholders, as evidence by the fact

that many in the conservation community have joined with us in calling for the BLM to include the West Mojave as one of the first additional SEZs.

This area may have been excluded from the initial list of SEZs because it is already subject to a Habitat Conservation Plan and federal land use plan amendment known as the West Mojave ("WEMO") Plan. Finalized in 2005, the WEMO Plan presents a comprehensive strategy to conserve and protect the desert tortoise, the Mohave ground squirrel, and nearly 100 other sensitive plants and animals and the natural communities of which they are a part. The Plan set aside 1.5 million acres of prime solar development land for a state protected species (the Mohave ground squirrel), lands for expansion of military reservations, as well as tens of thousands of acres for off road vehicle use. Unfortunately, the Plan failed to take account of the region's extraordinary solar resources and did not identify any land for renewable energy development. The Plan generically designated 1% of the certain restricted areas for all remaining uses, including renewable energy, but even this carve-out is unhelpful because BLM failed to include a process for identifying which lands would be acceptable for solar development.

Although the WEMO Plan aims to provide a comprehensive strategy to conserve and protect sensitive wildlife and their natural communities, the underlying science upon which vast amounts of land were set aside was not robust. For example, in the case of the Mohave ground squirrel, the available biological data was extremely weak, and relied upon outdated research from a single investigator. Based on this questionable evidence, the Plan reserved 1.5 million acres to protect core and non- core habitat (the Plan does not distinguish between the two) for a single state-only listed species.

Whether or not intentional, BLM's refusal to plan for renewable energy development in the WEMO Plan area has encouraged, and will continue to encourage, solar developers to seek to develop projects in less advantageous areas. In some instances, projects have been and will be sited in areas with significantly greater potential for environmental conflict because developers cannot overcome the severe restrictions of the WEMO Plan. In light of these circumstances, and questions surrounding the development of the WEMO Plan noted above, we suggest that BLM revisit the Plan as part of these PEIS proceedings to consider the creation of one or more SEZs in the West Mojave.

Admittedly, BLM's planning and review of the West Mojave will require significant resources. Efforts being undertaken in other contexts may be leveraged to save some time. For example, the State of California, through the California Energy Commission, has recently launched an extensive vegetation mapping exercise, the results of which should provide important and timely information for the BLM's review of the WEMO Plan, and for the California DRECP. In addition, CEERT, as part of its coordination of California's Renewable Energy Transmission Initiative (RETI) planning effort, has developed a map of the West Mojave which identifies the recommended areas which should be evaluated by BLM as part of its analysis of the West Mojave as a new SEZ. Even with these resources, there is still much work to be done to identify SEZs, but it will

be worthwhile to provide for development opportunities in this region with unparalleled solar resources.

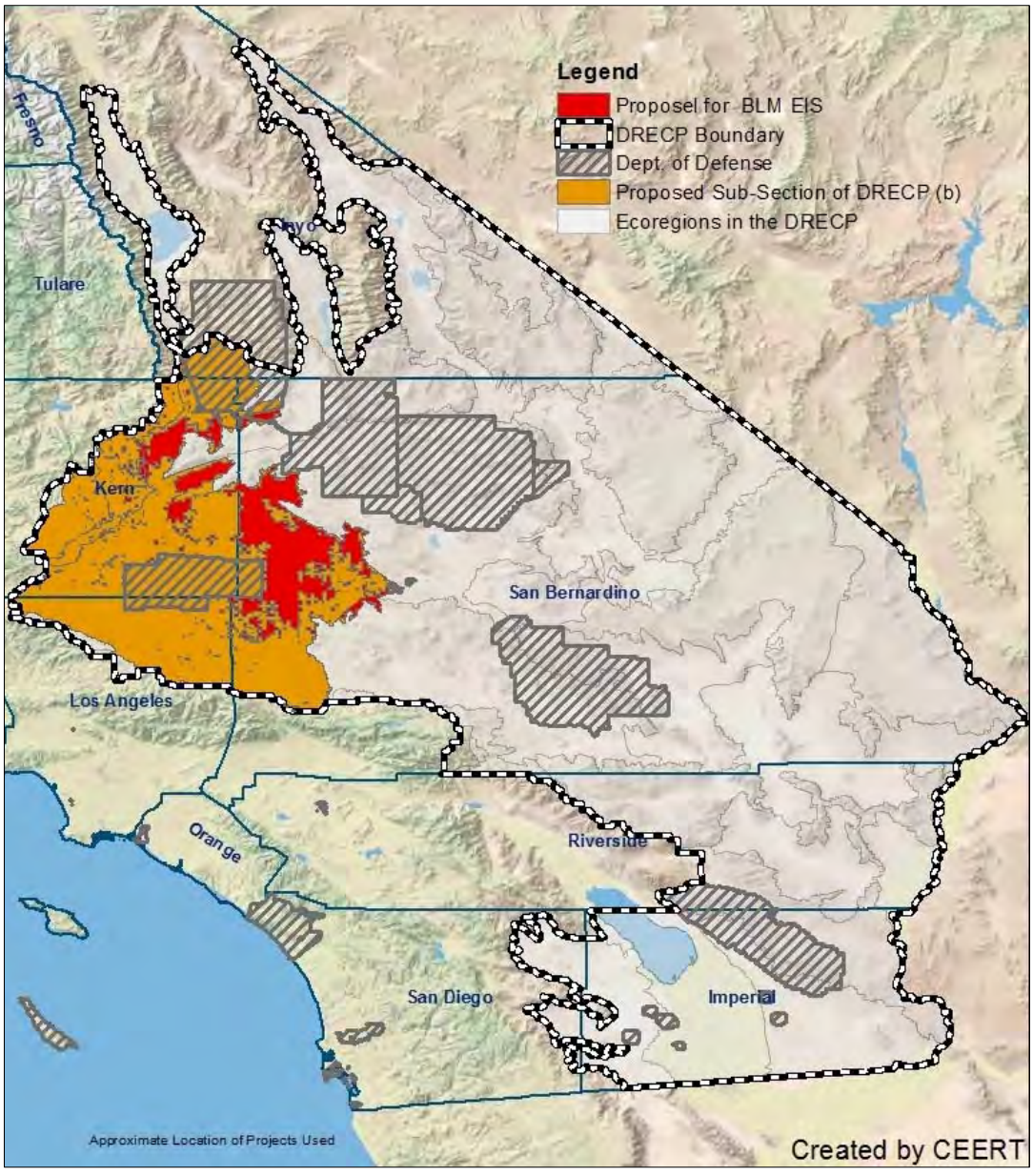

Figure 2. Suggested zone for studying the possibility of SEZs in the West Mojave.

Regarding the Chocolate Mountains, BLM has already indicated some intention to designate a SEZ in that area. We think it wise for BLM to consider SEZs in the

Chocolate Mountains and the area of the WEMO Plan. BLM should act with alacrity if these are new areas that it believes would accommodate significant solar development.

Consistent with the comments above, BLM should also consider designating more lands in Nevada and Arizona for solar development. In Arizona, we are informed that the BLM State Director excluded any acreage from SEZ consideration that is subject to a pending application. As a result, there were no applications in the areas that BLM identified as proposed SEZs, but many applications in other areas—thereby producing the opposite outcome intended for the PEIS; BLM should consider including those other areas. It is unclear how the proposed SEZs in Nevada were identified, or why there are not more SEZs in a state in which BLM manages 67% of the available land. These states have more and better areas with regard to insolation, load, and transmission, and the Draft PEIS unfairly ignores or minimizes the viability of their promising areas.

Solution: As stated above, BLM should establish a consistent process for identifying and approving new SEZs or SEZ expansions (assuming, of course, that those SEZs follow the recommendations we have laid out above). Such process will be important if BLM designates SEZs, and BLM should identify that process in the Final PEIS. BLM also should begin evaluating new potential SEZs in the West Mojave, Chocolate Mountains, lands identified in the Arizona Restoration Design Energy Project, and other areas. Figure 3 below depicts one possible area for West Mojave utility-scale solar development.

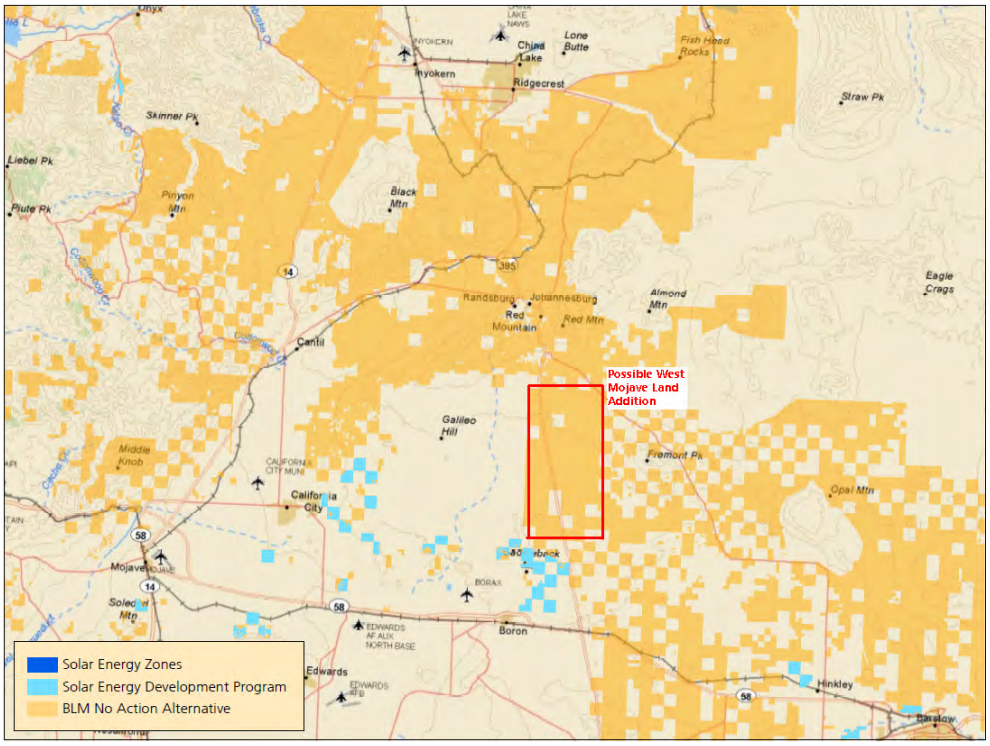

Figure 3. Proposed starting point for SEZ evaluations in the West Mojave.

3. The proposed SEZs do not adequately account for aviation, seismic, and state and local government considerations.

a. Aviation

The Draft PEIS notes that the locations of the proposed SEZs were developed considering all military and civilian airfields within five miles of the SEZ boundary. The Draft PEIS notes that the military also provided information that was used to identify potential area-wide impacts. In many instances, the military identified specific potential issues and concerns with SEZs that have been incorporated into the analysis. Because of the potential for differential impacts caused by different solar technologies and the various types of military uses, specific impact analysis and definition of impacts were not possible. Where military or civilian airfields are within 25 mi (40 km) of a SEZ, this was noted as a potential conflict.

The Draft PEIS states, however, that since FAA regulations would control activities near these facilities, no additional analysis was performed. Because of the site-specific nature of the potential impact on military airspace, no assessments of the potential level of impact could be made.

At least four of the SEZs are in known Special Use Airspace (SUA) zones: Bullard Wash in Arizona; Iron Mountain and Riverside East in California; and Red Sands in New Mexico. While SUA-related height restrictions are not likely to cause an impact to trough, PV or dish technologies, they could serve as a constraint on power tower technology. The lengthy FAA process for removing height restrictions could take up to one year to complete. In addition, determining the impact of FAA and military altitude restrictions must be done in the initial stages of a project, and obtaining an official position from the military on its aviation concerns can take up to one year from the time the request is made.

b. Seismic considerations

Seismic information for the Draft PEIS was determined from the USGS, state of California and literature reviews. Data included USGS Quaternary Fault and Fold database of the USA class A fault search, National Earthquake Information Center Database. This information was reviewed within a 100 km radius of the center of each SEZ. While these are excellent sources of information, project seismic requirements are defined by local or state codes and are usually subject to the International Building Code (IBC). The seismic investigation used for the Draft PEIS apparently did not consider the IBC, which is the defining requirement for projects.

c. Water resources

Regardless of whether a plant employs dry or air cooling, PV or dish technology, a small amount of water may be required for potable, sanitary, mirror cleaning, and other routine

maintenance activities. The Draft PEIS does not provide sufficient analysis of water resources. Determination of the adequacy of water resources is typically performed by a hydrology study, evaluation of nearby wells or by drilling test wells and having consultations with state or local water agencies. At this point, there is no way to determine if the proposed SEZs can provide enough water for the potential projects that could be placed in that SEZ.

If the PEIS requires multiple projects to be situated on a given site, then there is a high likelihood that a number of projects could exceed the ability of the underground reservoir and associated recharge system to provide water over the lifetime of the project or projects. Only a detailed assessment prior to designating a SEZ would provide enough information to make the determination of adequate water resources.

d. State and local considerations

In the selection of the SEZs, BLM staff was asked to identify areas near existing transmission or designated corridors. These areas also needed to be near existing roads, have slope of 1 to 2% or less with 5% slope as the maximum slope considered feasible, and contain a minimum of 2500 acres. Additionally, the preliminary results from the Western Governors Association Western Renewable Energy Zone Initiative were taken into consideration. Draft PEIS at App. D-1. Criteria from the Arizona Renewable Resource and Transmission Identification subcommittee also were used. Draft PEIS at App. D-21. BLM then selected the potential SEZs as being areas of low sensitivity.

In addition, BLM has not consulted with state or local authorities to determine significant issues that may arise in those arenas. BLM should engage state and local authorities to identify any potential issues in advance.

Solution: BLM should account for potential aviation, seismic, and water resources considerations when designating, or adjusting the boundaries of, SEZs. BLM also should engage in interagency cooperation with state and local governments to identify and mitigate any concerns, as well as with the FAA and the Department of Defense to identify and mitigate any concerns. *See also* Section II.F ("Miscellaneous issues").

4. BLM should prescribe a process for applying for land within designated SEZs, and only after it provides for public comment on that process.

The Draft PEIS does not specify a process for developers to apply for and secure parcels within designated SEZs, other than to suggest that BLM might use competitive bidding. As we explain below in Section II.F, we do not support a competitive bidding system because of the added costs such a system would impose on projects.

Whatever process BLM develops, BLM should not adopt that process without providing for public review and comment, including hearings. To be specific, BLM should not adopt a SEZ application process in the Final PEIS (unless BLM provides another public comment period, including on the proposed process) or in an Instruction Memorandum or other document that is not accompanied by a public comment period. The manner in which any SEZs will be made available for development will be vitally important to many developers and they should be given the opportunity to submit their views.

C. BLM should select the Solar Energy Development Program (Preferred) Alternative over the SEZ Alternative, but the Preferred Alternative also needs clarification and modification.

BLM should select the alternative that strikes the best balance between promoting utility-scale solar energy development and avoiding and minimizing the impacts of such development. The Solar Energy Development Program Alternative achieves that goal so long as BLM (a) *is able to designate SEZs in accordance with our comments above*, and (b) *modifies or clarifies the lands it would exclude from development* under the Preferred Alternative.

If BLM is unable to evaluate and designate SEZs that meet the criteria we have set forth above, we respectfully request that BLM evaluate and consider selecting a fourth alternative. Under this alternative, BLM would (1) finalize siting criteria and "comprehensive program administration and authorization policies and design features" (*see* Section II.D & Attachment A (discussing necessary modifications to policies and design features)); (2) clarify that the SEZs are interim pending further work and that they do not indicate that the entire acreage will be available or suitable for development; (3) conduct the additional work required to make the SEZs useful and publish a supplemental EIS and ROD once that work is complete.

However, we believe that BLM is capable of taking the actions we have recommended and issuing a Final PEIS in a timely manner. Whatever alternative BLM adopts, BLM must provide a clear and timely path forward for existing applications.

Among the two action alternatives considered, BLM is right to identify the Solar Energy Development Program Alternative as the agency's Preferred Alternative. As BLM explains, the Preferred Alternative "would likely result in the highest pace of development at lowest cost to the government, developers, and stakeholders," in part by providing the greatest siting flexibility. At the same time, the Preferred Alternative would "provide a comprehensive approach for ensuring the potential adverse impacts would be minimized to the greatest extent possible." Draft PEIS at ES-29. The Preferred Alternative would exclude solar development in the most sensitive areas, encourage development within the SEZs, and provide the greatest degree of flexibility in siting and designing projects—flexibility that is crucial to the long-term success of the utility-scale solar industry. *See*

generally Draft PEIS at 6-31 to 6-40, 6-48 to 6-53 (discussing benefits of Preferred Alternative).[18]

Our support of the Preferred Alternative—and in particular truly useful SEZs—is subject to several important caveats, discussed in Sections II.C.1 and II.C.2 immediately below.

1. Designation and incentives for SEZs

As we discuss above in Section II.B, the SEZs need substantial additional work if they are to be useful SEZs.

Policies to encourage development in fully-vetted SEZs make sense—indeed, they are crucial if SEZs are to have any value. These include, among other things, providing for streamlined environmental review in the form of EAs, providing expedited transmission interconnection assurances, and withdrawing SEZs from other uses including mining, oil and gas development, and grazing.[19] However, these incentives should not result in unreasonable delays in the processing of applications for projects outside SEZs. Such a result would yield a de facto SEZ-only alternative, which is untenable for the reasons we discuss below.

2. Modification of excluded lands criteria

In calculating which lands to exclude from solar development under the Preferred Alternative, BLM excluded lands that failed to meet basic criteria (greater than 5% slope and/or solar insolation levels below 6.5 kWh/m^2/day) or that fell within a special designation or contained special characteristics (e.g., ACECs, designated critical habitat, wilderness characteristics). The result is the exclusion of roughly 70 million acres of BLM-managed lands, as shown in pink on the state-by-state maps reproduced in the Executive Summary and throughout the PEIS. It is difficult to tell which screen or screens—slope, insolation, ACEC, etc.—was or were used to exclude any given acre. BLM should provide easy access to GIS data and shape files to make this screening process more transparent.[20] This is of particular concern to developers with existing projects located within the pink (excluded) areas—not only do they want to know what

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[18] We note below that no other energy industry is limited to zones, whether in addition to other development or solely in zones.

[19] We urge BLM to describe with particularity the incentives for development within SEZs, which the Draft PEIS describes only generally.

[20] In addition, BLM should not adopt blanket exclusions based on assumed conflicts with preexisting, approved human uses. Solar development is not inherently incompatible with all other uses and, through negotiations with preexisting users of a site, developers may be able to design facilities that allow for multiple uses to coexist. This is particularly true in instances where a proposed solar facility might conflict with existing recreational uses.

screen or screens BLM has applied to the lands that are the subject of their ROW applications, they want to work with BLM to address any concerns that those screens raise.[21] In accordance with our comments in Section II.A above, BLM should commit to timely processing these existing applications during the preparation of the Final PEIS and regardless of what the PEIS says.

Finally, certain of BLM's screening criteria for the Preferred Alternative are overly restrictive. Subject to the third caveat immediately above, we refer not to areas with special designations or certain sensitive resources (e.g., wilderness characteristics) but to basic land characteristics, including lands that have greater than 5% slope and/or solar insolation levels below 6.5 kWh/m^2/day, or which are located in special recreation areas. While these lands are unlikely to be the subject of initial development potential and interest, they may become more attractive over the 20-year life of the PEIS.[22] Certainly some of the private lands which solar companies are being urged to develop have lower insolation or greater slope, and as technologies progress, there may be projects that can utilize much steeper slopes. Moreover, while the bulk of an application may be in an area with 5% slope or less, some arrays may be moved up a hillside to an 8-10% slope (where current technology may be slightly less efficient) for purposes of avoiding resource conflicts. The exclusions, therefore, must be subject to a rule of reason. Categorically eliminating these lands from development does not account for this fact and serves little purpose.[23] The PEIS should recognize that these non-environmental factors currently limit development interest and feasibility but may not do so in the future, and allow for development in areas with those characteristics (assuming that other siting criteria are met).[24]

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[21] An example of such a constructive program is occurring in the Ivanpah Valley watershed in California and Nevada, where multiple stakeholders have agreed to study the biological characteristics and constraints of that area. Collaborative studies of this sort are preferable for the purpose of assessing where development should and should not take place, and under what conditions.

[22] In just a few short years, many photovoltaic (PV) systems have evolved and can now utilize slopes in the 8-10% range.

[23] The Draft PEIS recognizes that "concerns exist that by excluding [these] lands …, the BLM could be removing lands that some developers may find both technically and economically feasible to pursue in the future." Draft PEIS at 6-38. Indeed, almost the entire State of Nevada, 67% of whose lands BLM manages, is neither pink nor blue, but white—unavailable for development under any proposed alternative—in the Draft PEIS's maps. Moreover, the immense amount of land in pink, without explanation, leaves little of Nevada available for development. We strongly urge BLM to reconsider this determination, especially where not based on species concerns. *See* Section II.B.4-.6 (advocating for additional SEZs in Nevada).

[24] In any event we support BLM's decision to allow excluded areas to remain open to development of supporting infrastructure such as access roads and transmission lines. *See* Draft PEIS at ES-7 n.4 & 2-7.

3. The SEZ Alternative would significantly stymie utility-scale solar development with no added benefit.

Compared to the Preferred Alternative, the SEZ Alternative likely would slow the pace of development without offering any appreciable environmental protection advantage. Specifically, the SEZ Alternative likely would forestall many projects from being built, and force others on to private land.[25] This shift would drastically increase the cost of private land for development and compensatory mitigation, in turn further curbing solar development generally, including on already-disturbed lands.[26] Such a result would fail to meet BLM's goal of locating 10,000 MW of renewable energy on public lands.

In addition, utility-scale solar facilities seek to produce energy at a price that approaches grid parity, a critical achievement that will be arrested if developers face severe restrictions on their ability to develop economically feasible projects. Economic feasibility requires not only reasonable land valuations but flexibility in siting and the ability to develop in close proximity to load centers and with adequate access to the electricity market (i.e., transmission). The SEZ Alternative would eliminate this flexibility[27] and, given that many of the proposed SEZs are not close to load or transmission, leave developers stranded in remote areas with little market or transmission access. *See* Section II.B.4 (discussing market and transmission access problems with SEZs). The Draft PEIS does not fully evaluate these and other impacts associated with the SEZ Alternative.

What is worse, the SEZ Alternative would create these adverse impacts without offering any appreciable environmental protection benefit. While the SEZ Alternative could reduce or eliminate some of the impacts that might come from potentially dispersed development under the Preferred Alternative, the SEZ Alternative could "result in greater concentrations of impacts in the vicinity of the SEZs," Draft PEIS at ES-29, as well as in the SEZs themselves, Draft PEIS at 6-53. This is a real risk considering that BLM lacks

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[25] *See* Draft PEIS at 6-53 (stating assumption that "development that does not occur on BLM-administered lands was assumed to be made up for by development on non-BLM-administered lands"). This statement, however, does not account for the fact that private land cannot accommodate all (or even most) of the projects that otherwise would be built on public lands; there simply are not enough private lands that are commercially viable for this shift to occur.

[26] A zones-only approach on BLM-managed land could more directly discourage development on private lands adjacent to restricted (i.e., "no go") areas. State and local permitting authorities might be disinclined to permit projects on lands near areas that BLM has categorically excluded from development. While this outcome is possible under the Preferred Alternative, as well, far more private lands could suffer from this problem under the SEZ Alternative.

[27] Developers require and ask for a *reasonable* degree of flexibility. The SEZ Alternative would allow development on approximately 0.15% of BLM-managed lands in the six southwestern states covered by the PEIS. The Preferred Alternative would allow development on 4.9% of such lands. This is a critical difference but one that, even under the Preferred Alternative, would leave the overwhelming majority of BLM-managed lands off-limits to solar development.

the information it needs to accurately assess the SEZs' potential resource conflicts and carrying capacity. *See* Section II.B.

The SEZ alternative would not yield any net benefits to environmental protection over an alternative (like the Preferred Alternative) that provides more flexibility but imposes appropriate restrictions to ensure responsible development. As the Draft PEIS recognizes, the SEZ Alternative would (the Draft PEIS says "might" but that is far too optimistic) "reduce the flexibility of both the agency and developers in terms of identifying appropriate locations for utility-scale development. *There are likely to be economically attractive sites for solar energy development outside of the SEZs that can meet the environmental protection measures outlined in the PEIS*." Draft PEIS at 6-43 (emphasis added). Siting criteria that restrict development in high-conflict areas (*see* Attachment A and BLM's recent interim guidance[28]), combined with well-considered design policies and mitigation measures, can effectively promote solar development, preserve siting flexibility, and minimize adverse impacts; the SEZ Alternative cannot. The Preferred Alternative (with the modifications we propose) strikes an appropriate balance between promoting solar development and restricting it; the SEZ Alternative does not. No other industry that extracts energy resources or develops energy on BLM-managed lands is limited to zones, and there is no reason why the utility-scale solar industry, which is actively committed to responsible development and which supports significant restrictions to achieve that end, should be treated differently.

There are two more points. First, the SEZs would be inadequate even though they total 677,000 acres—463,000 acres more than the total acreage BLM estimates will be needed to produce 24,000 MW of solar-generated energy on BLM-managed lands over the 20-year life of the PEIS. As we discussed in detail in Section II.B above, many of the SEZs lack adequate access to existing or planned transmission, are located too far from load centers, already are the subject of applications, and/or raise concerns about sensitive resources. In addition, BLM lacks adequate detailed biological and cultural information about the SEZs to know whether additional problems will arise when developers try to site specific projects within the SEZ boundaries. It is highly likely that these known and potential conflicts will significantly reduce the amount of available or suitable acreage within the proposed SEZs for utility-scale solar development.[29] *See* Draft PEIS at 6-35

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[28] BLM, Instruction Memorandum No. 2011-061, *Solar and Wind Energy Applications - Pre-Application and Screening* (Feb. 7, 2011), available at http://www.blm.gov/pgdata/etc/medialib/blm/wo/Communications_Directorate/public_affairs/news_release_attachments.Par.79538.File.tmp/IM2011.61.Prescreening.pdf.

[29] BLM recognizes that not all of the land within the SEZs will be developable, although it optimistically assumes that 80% will be developable. Draft PEIS at 2-23. As discussed above and in Section II.B, this figure does not adequately account for the known and potential constraints associated with the proposed SEZs. See also Draft PEIS at 6-33 (recognizing that areas within the 22 million acres identified as available for development under the Preferred Alternative likely would not be "suitable for development because of as yet unidentified conflicts with other

("Based on the potential conflicts identified, some of the proposed SEZ areas may be reduced in size or eliminated entirely when the final SEZs are identified in the ROD for this PEIS."). The Draft PEIS appropriately recognizes this fact and concludes that, as a result, "it is possible that the amount of lands that would be available under the SEZ program alternative might not be enough to support full development of the RFDS in states other than Arizona and Colorado." Draft PEIS at 6-44; *see also* Draft PEIS at 6-40 to 6-45, 6-48 to 6-53 (discussing limitations of SEZ Alternative); Draft PEIS at 6-52.

Second, the SEZs would be inadequate even though BLM could expand or add new SEZs in the future. As BLM recognizes, BLM would need to propose a land use plan amendment and subject any proposed expanded or new SEZ to environmental review under NEPA. *See* Draft PEIS at ES-7, ES-12, 6-31 n.5. That is a multi-year process that cannot respond nimbly to developers' needs and market dynamics.[30] In addition, if development is restricted to SEZs, adequate SEZs are needed now, not in the future. The proposed SEZs are far from adequate for the reasons discussed above; developers will not build many of their projects and shift the remainder to private lands unless and until these inadequacies are addressed. BLM's ability to expand or add new SEZs cannot save the SEZ Alternative from its own problems.[31]

To be clear, in addition to believing that the SEZ Alternative would make bad policy, we believe that BLM cannot legally choose the SEZ Alternative. As discussed above, the SEZ Alternative does not fulfill the purpose and need of the PEIS or comply with applicable laws and mandates, and its impacts have not been adequately analyzed.

D. Energy policies and design features (Appendix A)

Many of the energy policies and design features proposed in Appendix A to the Draft PEIS are reasonable and necessary to protect natural resources. However, certain policies and features are unnecessarily restrictive because they are costly to solar development and

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resources"); Draft PEIS at 6-39 (same); Draft PEIS at 6-33 n.7 ("[G]overnment-to-government consultation and inter-agency consultation are still ongoing and could result in the identification of additional concerns" in the proposed SEZs). Our member companies' experiences over the last few years suggest that far less of the proposed SEZs—perhaps as low as 10-40%—will be developable.

[30] In fact, BLM considered suggestions to include additional SEZs in the Draft PEIS but could not because "the site-specific evaluation of SEZs requires a large amount of data and lengthy evaluation time." Draft PEIS at 2-29. Such process will be even longer if BLM gathers the information and conducts the analysis that we think is necessary for useful SEZs.

[31] This is not to say that BLM should not establish a process for identifying and approving new SEZs. *See* Section II.B.6. Such a process will be important if BLM designates SEZs, and BLM should identify that process in the Final PEIS. The point here is that that process cannot sufficiently ease, on a meaningful timeframe, the unreasonable constraints the SEZ Alternative would impose.

yet provide little benefit to the environment. The preference to avoid, then minimize, then mitigate adverse impacts is generally sound, but in some instances unnecessarily sacrifices development where mitigation can be truly effective, or where the impact at issue is not significant in the first place. As a result, a requirement to avoid and/or minimize impacts can unintentionally and unnecessarily add costs to a project.

We appreciate BLM's effort to provide specificity in the PEIS, but the agency must be careful to avoid broad brush strokes where small ones are needed. That is, some policies and design features may not apply to all projects. BLM should take care to craft the policies and features to avoid unintended or unnecessary constraints to solar development, and should allow for varying site conditions and solar field design.

Specific comments on the proposed policies and design features in Appendix A are provided in Attachment A to this document.

E. Rental and bonding policies

The Draft PEIS states that "elements of [BLM's] existing policies addressing rental fees, terms of authorization, due diligence, bonding requirements, and BLM access to records would remain in effect." Draft PEIS at ES-6 n.3. BLM should modify these policies to be less expensive and less restrictive for solar developers.

1. Rental policy

On June 10, 2010, BLM issued Instruction Memorandum No. 2010-141, *Solar Energy Interim Rental Policy* ("2010 Rental Policy"). The policy expires on September 30, 2011. Under the methodology reflected in the 2010 Rental Policy, the annual rent for a solar project located on BLM-managed lands depends on the project's acreage, power capacity, and type of solar technology. Although the rental policy helpfully provides a greater level of certainty for developers (which is helpful in negotiating PPAs and other contracts), the rents it establishes are too high. BLM should use the Final PEIS to establish a new policy that takes the following considerations and points into account:

- Most BLM lands that are desirable for solar development are located in arid regions where public land value is based on grazing, recreational or open public use. As such, rents—particularly acreage-based fees—should not be very high given the nature of the BLM lands proposed for use. BLM must remember that solar developers do not acquire BLM's mineral rights when they receive a ROW grant.

- Utility-scale solar companies have begun securing similar or comparable private lands for project development and/or mitigation. These land values are typically in the range of $900-$2,500 per acre, excluding mineral and water rights. These lands generally do not have agricultural, industrial, or other development value, other than the proposed solar use.

- Using standard industry MAI appraisal methods, and also using Uniform Appraisal Standards for Federal Land Acquisitions (Yellow Book standards), annual rental values should be in the range of $72-$200 per acre per year, given a capitalization rate of 8%. When acreage- and capacity-based fees are combined, BLM's 2010 Rental Policy establishes much higher values, particularly for Riverside County in California, with little explanation. BLM's rents also appear to be based largely on the value of irrigated agricultural land, which have a higher value than the non-irrigated lands on which most projects are proposed.

- Rental fees are self-reinforcing in that they are to be used to set the "highest and best" use of BLM-managed lands (i.e., BLM may determine that the alternative highest and best use for a given parcel is another large-scale solar facility, rather than grazing, recreation, etc.). For this reason, BLM must be especially careful in its calculations.

- According to the Draft PEIS, BLM typically uses a 50% encumbrance factor when setting acreage-based rents. However, for utility-scale solar projects, BLM uses a 100% encumbrance factor "to reflect the high density land use common to solar energy projects." Draft PEIS App. A at A-11. Yet the Draft PEIS also states that the capacity-based fee is necessary to "capture the increased industrial use value of the authorization, above the limited rural/agricultural land value captured by the base rent." Draft PEIS App. A at A-12. Because BLM already has doubled the base rent encumbrance factor it normally uses, it is unclear how BLM can justify an additional capacity-based fee can be justified.

The rents established by the 2010 Rental Policy impose a significant burden on the economic feasibility of many projects, at a time when solar energy is not yet cost-competitive with other sources of electricity.[32] Moreover, high rental rates on public lands lead to higher purchase prices for private lands, making it ever more difficult to develop projects and purchase lands for compensatory mitigation. BLM should reduce the acreage- and/or capacity-based fees to arrive at more reasonable rental rates.

If BLM insists on charging the high rates set forth in the 2010 Rental Policy, it should adjust the number of acres deemed to be occupied by a solar facility. For example, rather

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[32] Per the 2010 Rental Policy, base rent for a 250-MW, 1,950-acre project in Riverside County will be $313.88 per acre per year, or $17.8 million over the project's estimated 30-year life (assuming a 20-year PPA with no extension). A net present value calculation using the Rental Policy's assumed federal discount rate of 5% yields $4,825 per acre per year. If the capacity-based rent factor is added (assuming that the project begins operation within 3 years), total rent over 30 years increases by $17.7 million, with a total net present value of $7,951 per acre per year. This value far exceeds the market price of similarly-situated lands.

than calculating the number of acres occupied based simply on the ROW grant, BLM should calculate that number based on the number of acres that project facilities physically occupy. Such calculation would be a better measure of a project's impact and provide for a more reasonable rent schedule. Alternatively, BLM could reduce the encumbrance factor to 50% for that land that does not actually house the facilities associated with a project.

2. Bonding policy

On October 13, 2010, BLM issued Instruction Memorandum No. 2011-003, *Solar Energy Development Policy* ("2010 Solar Policy"). The policy expires on September 30, 2011. Among other things, the Policy requires developers to post a performance and reclamation bond for each project. Acceptable bond instruments are cash, cashier's or certified checks, certificate or book entry deposits, negotiable U.S. Treasury securities, surety bonds, irrevocable letters of credit, and an insurance policy that identifies BLM as the beneficiary. A bond must cover liabilities associated with hazardous materials, decommissioning, and reclamation. In calculating bond amounts, BLM will look to the bonding requirements applicable to mining operations under 43 C.F.R. Subpart 3809.

BLM should use the Final PEIS to revise the bonding requirements set forth in the 2010 Solar Policy. We understand and support the important obligation to decommission solar projects and reclaim BLM-managed lands when those projects reach the end of their useful economic lives. We also appreciate that BLM allows bond amounts to be increased on a graduated basis during construction. However, the bond instruments that BLM will accept are too narrow and the bond amounts that BLM is requiring are too high.

a. The bonding requirements for surface mining operations do not and should not apply to utility-scale solar projects.

The 2010 Solar Policy indicates that BLM calculates bonds for utility-scale solar projects in part by using the surface mining requirements set forth in 43 C.F.R. Subpart 3809, §§ 3809.500-.599. This approach is misplaced, imposes onerous and unnecessary costs on the solar industry, and provides no additional public land protection.

BLM promulgated surface mining financial assurance regulations in response to the "inability or unwillingness of some operators to meet their reclamation obligations" as mine operators simply abandoned mines. 65 Fed. Reg. 69,998, 70,002 (Nov. 21, 2000). To avoid, or at least limit, taxpayer liability for unsecured or undersecured surface disturbances caused by mining, BLM now requires a project developer to provide financial assurance that it will be able to cover all costs of reclamation. 43 C.F.R. §§ 3809.500-.599. Reclamation concerns identified in the surface mining context include: (1) isolation, control, or removal of acid-forming, toxic, or deleterious substances; (2) re-grading and reshaping to conform with adjacent landforms, facilitate revegetation, control drainage,

and minimize erosion; (3) rehabilitation of fisheries and wildlife habitat; (4) placing growth medium and establishing self-sustaining vegetation; (5) removal or stabilization of buildings, structures, or other support facilities; (6) plugging of drill holes and closure of underground workings; and (7) providing for post-mining monitoring, maintenance, or treatment. 43 C.F.R. § 3809.5 ("Reclamation").

In contrast to surface mining operations, there is little risk that solar projects will be abandoned and BLM left with significant reclamation liability. A mine can become unprofitable due to unexpected and sudden swings in commodity prices. The decision to shut down a mine is driven by the need to eliminate the ongoing cash drain which occurs when operating costs exceed revenue during low price periods, even for mines with substantial remaining deposits. (As commodity prices swing, that portion of the deposit that is economic to mine ("reserves") also changes.) In contrast, a typical utility-scale solar power plant can require well over $1 billion in capital investment, in effect representing a pre-payment of "fuel cost", and before it can be built, must be first be secured by a long-term power contract (called a power purchase agreement, or PPA) with a utility customer at a fixed price for the power it generates. The project is either project-financed or balance sheet-financed by an owner with the financial resources to fund the significant capital investment required to build or acquire the solar facility.[33] In addition, the closest point in time at which a solar power plant is to be decommissioned is predictable—i.e., tied to the term of the PPA, which typically lasts 25 years with the possibility of extensions. Finally, a solar power plant has very low operating costs (since the "fuel" is "pre-paid"), providing healthy cash margins from fixed revenues. For all these reasons, it is extremely unlikely that the owner of a solar project or its lenders would walk away from a project. For these reasons, BLM's surface mining requirements are inapplicable to solar projects.

The 2010 Solar Policy also does not establish a transparent process for calculating the amounts of performance and reclamation bonds. Under the Policy, a developer must submit a Reclamation Cost Estimate to the BLM authorized officer, who sets the bond amount in coordination with the Solar Energy Bond Review Team. While we appreciate the good relationships developers share with BLM authorized officers, and the effort to ensure that bonds are consistent, developers have little input beyond the RCE into the bonds that are required for their projects.

b. Acceptable bonding instruments should include corporate guarantees backed by financial tests.

The 2010 Solar Policy states that "BLM will not accept a corporate guarantee as an acceptable form of bond." This is unnecessarily restrictive. BLM's requirements and

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[33] Indeed, BLM makes a showing of such financial feasibility a requirement for securing a ROW. 43 C.F.R. §§ 2804.12(a)(5), 2804.26(a)(5); *see also id.* § 2884.11(c)(9), 2884.23(a)(5) (imposing same requirement for ROW grants under Mineral Leasing Act).

goals could be satisfied by a corporate guarantee backed by a demonstration of adequate financial capacity to cover project reclamation and decommissioning costs. BLM has discretion to accept corporate guarantees as financial assurance. *See* 43 U.S.C. § 1764(i) ("*Where he deems it appropriate*, the Secretary concerned *may* require a holder of a right-of-way to furnish a bond, *or other security*, satisfactory to him to secure all or any of the obligations imposed by the terms and conditions of the right-of-way or by any rule or regulation of the Secretary concerned.") (emphasis added); *see also* 43 C.F.R. § 2805.12(g) (providing that, "*[i]f* BLM requires," a ROW grant holder must obtain "a surety bond *or other acceptable security*") (emphasis added).

Other federal and state agencies rely on a broad range of financial assurance instruments, including corporate guarantees. For example, the U.S. Environmental Protection Agency and the Nuclear Regulatory Commission accept a financial test (based on a company's year-end audited financials) and a parent company guarantee that demonstrate sufficient financial viability for addressing the decommissioning and cleanup costs associated with hazardous waste handling, storage and treatment and/or radioactive isotope handling.[34] 40 C.F.R. Parts 264, Subpart H; 40 C.F.R. Part 265, Subpart H; and 10 C.F.R. Parts 30. Similarly, the California Department of Toxic Substances Control accepts a financial test or corporate guarantee, trust fund, letter of credit, and/or insurance in lieu of a surety bond for securing the decommissioning and cleanup costs associated with hazardous waste handling, storage and treatment. *See* 22 C.C.R. §§ 66264.143(f), .145. Under the financial test option, an applicant must provide, on an annual basis, externally-audited financial statements and must maintain certain debt-to-asset/income ratios. *Id.* § 66264.143(f). Under the corporate guarantee option, a parent, grandparent, or sibling company may provide financial assurance in place of the applicant by providing essentially the same information required under the financial test. *Id.* § 66264.143(f). Given this governmental precedent for allowing other financial instruments—particularly in the hazardous waste context, where negative environmental impacts are likely more serious, and reclamation costs likely much higher, than in the solar context—BLM should provide similar flexibility here.

Moreover, the point of financial assurance is not that *BLM* must have adequate funds to cover reclamation costs at the moment when decommissioning and reclamation are required, but rather that there must be *someone* who has those funds and is legally obligated to provide them at that moment. As discussed above, the owner of a solar power plant is uniquely positioned to provide assurance through a financial test/corporate guarantee

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[34] These financial assurance mechanisms are part of the requirements set forth in the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6901 et seq. and the Atomic Energy Act of 1954, as amended (68 Stat. 919) and under title II of the Energy Reorganization Act of 1974 (88 Stat. 1242).

because the owner will have a PPA and on-going obligations that disincentivize and even preclude easy abandonment of its project.[35]

We also are aware that BLM Manual MS-2805, which states that "bonds are normally required" for ROW grants, reflects BLM's typical practice. *See* BLM Manual MS-2805, Terms and Conditions for FLPMA Grants, § .12D. However, as BLM is aware, solar power plants are not like most uses that BLM approves by ROW grant. BLM typically uses ROW grants to permit smaller, less intensive facilities (including linear facilities), which have correspondingly lower reclamation costs. For those projects, a surety bond may make sense. But for more capital-intensive uses covering larger areas, like solar power plants, the value of the solar plant far exceeds any reasonable estimate of the reclamation and decommissioning costs that will be incurred at the end of the plant's economic life.

Requiring a surety bond or similar instrument can impose millions of dollars of additional annual cost, in some cases nearly doubling annual operating costs. By way of example, if BLM requires a reclamation bond of $10 million, a letter of credit or surety bond with a rate as high a 6% would impose $600,000 in additional annual operating costs. These added costs would jump to $2.1 million for a $50 million reclamation bond. These excessive costs are particularly problematic for projects that already have signed PPAs, since the costs cannot be passed on to customers. The added costs go to financial institutions as profit, not to BLM (or even the United States Treasury) as cost recovery or program support funds, and are not covered by DOE loan guarantees. The added costs impede the solar industry's effort to provide electricity at competitive prices, and provide no additional protection of public lands.

Finally, BLM imposes mandatory minimum bonding requirements in the oil and gas leasing context. *See* 43 C.F.R. subpt. 3401 ("Bonds"). While restrictive, mandatory, and minimum bonding requirements are appropriate in the oil and gas context due to the real and catastrophic potential for natural resource damages, as evidenced by the recent oil spill in the Gulf of Mexico, solar projects present significantly fewer and less severe potential harms, for the reasons outlined above. Accordingly, use of more expansive financial assurance instruments is appropriate in the utility-scale solar context.

c. Bond amounts should be reduced, including to reflect a reclamation credit.

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[35] With solar projects, most of the investment is in the ground. There are no variable fuel costs that could cause a plant to shut down in the middle of extreme volatility. A developer with a PPA has more incentive to maintain the plant and continue operations because most of its costs are already sunk. The developer will only need to cover its going-forward costs (e.g., insurance, rent, operations and maintenance) even in the worst case scenario where a lender foreclosed on a loan.

Regardless of whether BLM allows a financial test/corporate guarantee as a form of security, BLM should reduce the bond amounts it requires through operation of the 2010 Solar Policy. As discussed above, letters of credit and surety bonds impose excessive operating costs on projects. Also as discussed above, the risk of abandonment of a project is minimal, and the value of a solar project high, factors BLM should include in its bond calculations. Because BLM conducts periodic review of bond amounts, it can adjust the amount of a required bond closer to the time that decommissioning actually will occur. One option that would capture these factors and set more appropriate bond amounts would be to maintain a portion of the reclamation bond in the form of security, to be increased each year throughout the term of a project's PPA. The total bond amount would be achieved a few years prior to expiration of the agreement. If the agreement is extended, BLM and the project developer could modify the amount of required security.

In Instruction Memorandum No. 2011-003 and in Draft PEIS Appendix A, BLM elected not to follow standard energy industry practice and recognize a reclamation credit at the decommissioning stage that could help to offset the size of reclamation bond required. We disagree with a decision by BLM to rely on mining reclamation guidance to establish requirements for this phase due to resource impacts that are very different than those of a solar power plant. The concrete, glass, metal, and other infrastructure used to construct a solar facility have a recognized value in the marketplace of recycled products and BLM's standards should reflect that fact.

F. Miscellaneous issues

The following miscellaneous issues also bear comment:

- The nature and extent of BLM's cooperation with the California Energy Commission is crucial to the siting of future solar thermal projects in California. The permitting of several initial projects revealed both benefits and problems with the agencies' coordination efforts. We urge BLM to consider how those problems might be overcome for future projects.

- We urge BLM to develop policies for fostering more and better interagency coordination generally. The MOU in California among BLM, FWS, the California Energy Commission, and the California Department of Fish and Game is an example of how an MOU can improve interagency coordination. There may be other tools, such as inter-agency working groups, that can foster coordination.

- Coordination among the Departments of the Interior, Defense, Agriculture, and Transportation, and the Federal Energy Regulatory Commission, to improve the identification and resolution of conflicts in the development of solar projects and transmission could ensure greater consistency and predictability in conflict resolution. Coordination among agencies with resource management responsibilities could similarly establish uniform

mitigation requirements applicable in areas with certain characteristics and thereby ensure that developers are not required to mitigate the same impacts in more than one way.

- The Final PEIS should contain more specific guidance on coordination with military and civilian aviation and radar concerns. BLM entered into an MOU with the Defense Department concerning aviation issues associated with wind energy projects—similar MOUs with the Defense Department and the Federal Aviation Administration would more efficiently resolve similar issues associated with utility-scale solar projects.

- The Final PEIS should consider how the federal policies will coordinate with the mitigation measures that will be developed as part of the California DRECP, and those in the recently issued FWS guidance on the Bald and Golden Eagle and Migratory Bird Treaty Act, Executive Order 13186, regarding migratory birds and renewable energy projects. This recommendation also relates to the suggestion above that BLM coordinate with other agencies with resource management responsibilities to ensure that developers are not subject to multiple mitigation standards.

- Competitive bidding likely will increase the costs of developing utility-scale solar projects on public lands. Combined with high rental rates, bonds, and other costs, some developers that might have pursued projects on public lands will pursue projects on private lands or not at all.

III. Comments on the Draft PEIS (DOE)

DOE has evaluated two alternatives in the Draft PEIS: a no action alternative and an action alternative (the preferred alternative) under which DOE would "develop programmatic guidance to further integrate environmental considerations into [DOE's] analysis and selection of solar projects that [DOE] will support." PEIS at 7-1; 75 Fed. Reg. 78,980, 78,983 (Dec. 17, 2010). In other words, DOE would develop criteria it would use to decide which projects to invest in and to streamline the NEPA reviews DOE conducts for those investment decisions. DOE states that this guidance would apply to "all lands," not just those that BLM manages. Draft PEIS at ES-36 to ES-38. DOE correctly concludes that the preferred alternative would reduce adverse impacts of utility-scale solar development, increase the pace and decrease the costs of that development, and accelerate the greenhouse gas-reducing and economic benefits that are expected from that development. Draft PEIS at ES-38 to ES-39. We support DOE's preferred alternative, though we would like clarification on exactly which "lands" the criteria would apply to.

Although not part of the Draft PEIS, DOE may elect to establish guidance for "previously disturbed lands" (the definition of which is unclear) and similarly, DOE may also elect to promote guidelines for locations near populated areas. Most industrial

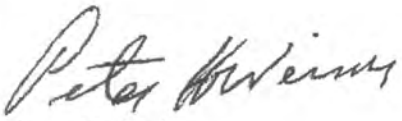
facilities prefer to locate away from populated areas. While this may sound good from a land-use perspective, locating sites near populated areas will raise concerns from the local populace and may result in additional cost impacts to the projects.

IV. Conclusion

LSA, CEERT, and SEIA sincerely appreciate BLM's efforts to promote responsible solar energy development of public lands through the preparation of the Solar PEIS. With the important additional work and modifications we have discussed above, the PEIS can serve a critically useful role in promoting and guiding the development of solar energy while protecting our natural environment.

Thank you for your time and consideration.

Sincerely,



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Attachment A: Comments on Appendix A (proposed policies and design features)

Attachment A

Draft Solar PEIS – Comments on Appendix A
(Proposed Energy Policies and Design Features)

Page	Text	Comment
General Comment	Various text throughout Appendix A.	Use of the term "avoid" should be limited to situations where absolute prohibition of an activity is necessary. "Avoid" is used extensively throughout Appendix A, but often in situations where avoidance is not necessary or the impacts can be otherwise mitigated without prohibiting the activity.
General Comment	Various text throughout Appendix A.	Design features and mitigation should be intended to mitigate a potentially significant impact, not to always eliminate or minimize the potential for impacts, regardless of their significance. Cumulatively, these requirements can become very expense and may be unnecessary. These types of requirements should be addressed at the project level, not the programmatic level.
General Comment	Various text throughout Appendix A.	The proposed design features seem to be primarily directed at limiting available land, but do not in turn provide specifics about what land will be left after all the limitations are imposed.
General Comment	Proposed addition to Appendix A.	The final Solar PEIS should address and clarify how its provisions will or will not modify the several solar-related BLM Instruction Memorandums that were released over the past few years: • IM-2007-097- Solar Energy Policy (4/4/07) • IM-2009-167- Application of Visual Resource Management to Renewable Energy (7/7/2009) • IM-2010-141- Solar Interim Rental Policy (6/10/10) • IM-2011-003- Solar Energy Development Policy (10/13/10) • Solar Plan of Development (1/31/2011) • IM-2011-059- NEPA Compliance for Utility Scale (2/08/11) • IM-2011-060- Solar and Wind Due Diligence (2/08/11) • IM-2011-061- Solar and Wind Pre-Application and Screening (2/08/11)
A-13 "Megawatt	The MW capacity fee established by this IM is: $5,256 per MW for photovoltaic (PV) solar projects; $6,570 per MW	How are these fees applied if a facility is down for routine or major maintenance? How are these fees applies if a facility is down due to loss

Page	Text	Comment
Capacity Fee" Para. 4	for concentrated PV and concentrated solar power (parabolic trough, power tower and solar dish/engine) projects without storage capacity; and $7,884 per MW for concentrated solar power projects with storage capacity of 3 hours or more.	of a major generating component?
A-17 "Term of Authorization" Para. 2	The BLM will therefore issue all solar energy right-of-way authorizations for a term not to exceed 30 years.	There should be flexibility when it comes to determining the term of a solar right-of-way because the expected life of many solar facilities is well beyond 30 years.
A-19 "Diligent Development" Para. 5	The BLM authorized officer may suspend or terminate the authorization when the holder fails to comply with the diligent development terms and conditions of the authorization (43 CFR 2807.17).	This provision would provide for exclusions if the BLM or other agencies do not accomplish their obligations in an agreed-upon time, or impede financing. It should be made clear that only affirmative failures on the part of the holder warrant suspension or termination.
A-19 "Diligent Development" Para. 8	In addition, the grant will specify that any idle, improperly functioning, or abandoned equipment or facilities that have been inoperative for any continuous period of 3 months must be repaired, placed into service, or removed from the site within 30 days from receipt of a written Notice of Failure to Ensure Diligent Development, unless the holder is provided an extension of time by the BLM authorized officer.	The time period provided for in this provision must be flexible, as equipment failure – of a main step-up transformer, for example – can result in extensive repair times.
A-20 "Performance and Reclamation Bond" Para. 3	The BLM authorized officer may increase or decrease the bond amount at any time during the term of the right-of-way authorization, consistent with the regulations (43 CFR 2805.12(g)).	Most financial institutions view unfavorably the ability of a bond amount to fluctuate, absent some type of cap.
A-20 "Performance and Reclamation Bond"	If a holder uses herbicides extensively, this component of the bond amount may be significant.	"Extensive use" is too general and subjective.

Page	Text	Comment
Para. 5		
A-26 Lines 12-14	The BLM may offer lands within solar energy zones (SEZs) for competitive ROW authorizations on its own motion or as a result of nominations by the public.	Existing applications within SEZs should be given an opportunity to complete the application process before sites are competitively bid.
A-26 Lines 16-18	If lands within SEZs are not offered competitively, solar energy development applications for such lands will receive priority processing over other solar energy development applications.	This would have an adverse impact on existing applications outside of SEZs and could delay advanced solar projects due to lack of committed BLM resources.
A-26 Lines 20-22	The BLM will discourage applicants from filing ROW applications for the purpose of speculating, controlling, or hindering development of solar energy on public lands.	How would this be implemented? Timeframes for advancement of permitting? Demonstration of financial capability? We agree that there should be mechanisms to prevent speculative applications and the PEIS should provide guidance that a field office can use to identify speculators, but existing applications should be given a reasonable opportunity to complete the ROW process.
A-27 Lines 9-13	The BLM will review applications for land use plan conformance (43 CFR 1610.5-3). To be considered further, applications must conform to the existing land use plan as amended by the Solar Programmatic Environmental Impact Statement (PEIS), including all solar ROW exclusions identified in Table 2.2-2.	Projects should be allowed to show compatibility with existing land use plans on a site-specific basis. It may be feasible to design projects to be compatible in areas that would otherwise preclude solar development. Given the complexity of BLM land management programs, it is likely that some amendment to an existing RMP will be required. To condition applications on a requirement that no RMP amendment be necessary would exclude many otherwise viable and environmentally compatible solar projects.
A-27 Lines 40-44	Entities seeking to develop a solar energy project on BLM-administered lands shall contact any potentially affected grazing permitee/lessee, in conjunction with BLM staff, to discuss potential impacts of the proposal, possible alternatives that could be addressed in scoping for the National Environmental Policy Act (NEPA), and potential mitigation and compensation strategies.	Situations where there are prior claims to the land can be problematic to solar development, since proposed mitigation measures may be too expensive to justify development. The BLM should make every effort to identify areas of potential overlap.
A-28 Lines 1-5	Entities seeking to develop a solar energy project on BLM-administered lands shall contact the owner of any federal mining claim located with the boundaries of the proposed	Same comment as above.

Page	Text	Comment
	solar energy project, in conjunction with BLM staff, to ensure that there is a potential for resolving any conflicts with federal mining claims.	
A-30 Lines 40-43	Management goals and objectives for special status species (such as the sage grouse and desert tortoise) that the BLM has identified in land use plans or goals and objectives substantiated by best available information or science shall be incorporated into the POD for proposed solar energy projects.	T&E species will be subject to Section 7 review and Biological Opinion conditions – this should not reach beyond these requirements.
A-34 Lines 24-25	The solar ROW authorization may be assigned consistent with the regulations, but all assignments are subject to approval by the BLM authorized officer.	There should be criteria for denial of assignment. It should be based on factors like the assignee's financial ability to perform and not on arbitrary factors.
A-34 Lines 46-47 A-35 Lines 1-3	….[Design features and exceptions]…. authorizations. It is anticipated that variations in the design features presented will be approved in very limited circumstances. Those design features that do not apply to a given project will need to be described as part of the project file along with an appropriate rationale. Additional mitigation measures may be identified and required during individual project development and environmental review.	This highlights the need for the design features to be very carefully crafted so that they are applicable to all projects and situations, and exclude requirements that may not apply or that could unnecessarily constrain development. Detailed requirements should be left to the project ROW approval.
A-35 Lines 12-13	Many of the proposed design features indicate the need for project-specific mitigation plans (see Table A.2-1 [which includes, among others: Glint and Glare Assessment, Mitigation, and Monitoring Plan; Heliostat Positioning Plan; and Unanticipated Burial Contingency Plan]).	Implementation of a glint and glare plan is not practical because glint and glare are dependent on mirror positions, sunlight angles, and viewer angles, all of which are changing constantly during the day. Existing solar facilities have operated for years with no reported glint and glare problems. It is not clear what a "Heliostat Positioning Plan" would require, but this type of information is proprietary and should not be required in any document that may become public.
A-36 Lines 39-42	Consolidation of access and other supporting infrastructure shall be required for single projects and for cases in which there is more than one project in close proximity to another	This should be qualified that consolidation will be required where feasible and safe, and where such consolidation is necessary to reduce environmental and land use impacts to less than significant.

Page	Text	Comment
	in order to maximize the efficient use of public land.	
A-37 Lines 35-38	Any lands that have not been recently inventoried for wilderness characteristics or any lands that have been identified in any citizen's wilderness proposal shall be inventoried for wilderness characteristics prior to any solar development action being approved within these areas.	What would be the timing for this requirement and what kind of study would it involve? This seems to have serious schedule and cost implications for the project. The requirement that "any citizen's wilderness proposal" be evaluated in a ROW application creates an opportunity for nuisance filings that would be expensive and could delay otherwise viable solar development. Citizens' wilderness proposals should be vetted by BLM for merit before burdening solar projects with inventorying these proposals.
A-38 Lines 19-24	Activities of project developers shall be coordinated with the BLM and other stakeholders to ensure that impacts on wild horses and burros and their management areas are minimized. Issues to be addressed could include the installation of fencing and access control, provision for movement corridors, delineation of open range, traffic management (e.g., vehicle speeds), and access to water sources.	Implementation of wild horse and burro movement corridors could affect plant operations and introduce the potential for injuries to horses or burros where operating personnel cross such a corridor.
A-38 Lines 44-46	The ROWs for solar facilities shall be large enough to ensure there is a sufficient fire break inside the ROW so there would be no threat to facilities from either a wildland fire approaching from outside the ROW or a fire ….	Achieving "no threat" may not be feasible. The requirement should be to mitigate risk to less than significant.
A-39 Lines 13-14	Public access through or around solar facilities shall be retained to permit continued use of public lands and non-BLM administered lands.	"Through" facilities is likely problematic from a liability and security standpoint, and access around facilities may require action by BLM with regard to designation of new roads/trails. Applicants may have limited ability to comply with "around solar facility" access.
A-39 Lines 16-17	Solar facilities shall not be placed in areas of unique or important recreation resources.	This requirement should be evaluated on a case-by-case basis. Some solar development in these areas may be feasible without adversely impacting recreational use.
A-39 Lines 34-37	The FAA shall be contacted early in the process of considering a solar energy project application to determine if there might be any potential impacts on aviation and if any mitigation might be required to protect military or civilian	The FAA process is fairly well defined and it may not allow for routinely reviewing projects early in the process. Proposed projects will file for any necessary FAA review as required by FAA regulations.

Page	Text	Comment
	aviation use.	
A-41 Lines 5-10	Land disturbance (including crossings) in natural drainage systems and groundwater recharge zones, specifically ephemeral washes and dry lake beds, are to be avoided. Any structures crossing drainages must be located and constructed so that they do not decrease channel stability or increase water volume or velocity. Developers shall obtain all applicable federal and state permits.	"Avoided" is too restrictive. Disturbance in these areas should be allowed, provided impacts are adequately mitigated to less than significant. Ephemeral washes can be very small and mitigation of impacts to these features may often be feasible. Because of the land use requirements for solar project, some drainage crossing may be necessary. This requirement should be revised to "minimize," not "avoid."
A-41 Lines 12-13	Solar facilities or components (e.g., heliostats, panels, dishes, and troughs) shall not be placed in natural drainage ways.	"Shall not be placed" is too restrictive. Placement in these areas should be allowed, provided impacts are adequately mitigated to less than significant.
A-41 Lines 26-29	New roads shall be designed to follow natural land contours and avoid or minimize hill cuts in the project area and avoid existing desert washes. Siting of new roads and walking trails (if any) is to be consistent with the designation criteria specified by the BLM in 43 CFR 8342.1.	This is too restrictive. Following contours to the extent feasible should be required (otherwise you cannot gain or lose elevation; flat roads only); avoiding washes completely is too restrictive. Again, it should be tied to impacts and subject to mitigating impacts to less than significant.
A-41 Lines 41-43	Areas with unstable slopes shall be avoided, and local factors that can cause slope instability (e.g., groundwater conditions, precipitation, earthquake activity, slope angles, and the dip angles of geologic strata) shall be identified.	Avoiding unstable slopes is too restrictive; can often mitigate unstable conditions.
A-42 Line 25	Originally excavated materials shall be used for backfill.	Excavated materials should be used to the extent they provide suitable backfill.
A-42 Lines 34-35	Drainage crossings shall be stabilized as quickly as possible, and channel erosion from runoff caused by the project shall be prevented.	Preventing erosion from runoff is not always practical; should be "mitigated."
A-43 Lines 21-22	Construction traffic shall avoid unpaved surfaces (to reduce the risk of compaction) and reduce speed to lessen fugitive dust emissions.	"Avoid" is too restrictive. Not all roads should be paved, and dust emissions can be mitigated.
A-44 Line 30	Construction on wet soils shall be avoided.	Avoiding wet soils to too restrictive. This could unnecessarily preclude winter construction activities.

Page	Text	Comment
A-44 Lines 35-36	All design features developed for the construction phase shall be applied to similar activities during the operations phase.	Not all construction phase design features may apply to operations. This should say "all applicable" design features shall be applied.
A-48 Lines 15-16	Natural drainages and a pre-project hydrograph shall be maintained for the area.	May not be feasible or necessary to maintain all minor drainages. This design feature should require that the project design should maintain downstream hydrographs and provide for protection of onsite improvements.
A-48 Lines 23-24	Siting in identified 100-year floodplains shall not be allowed within the development.	Minor construction, such as transmission poles should be allowable. This can be accomplished without significant impact to flood plain.
A-51 Lines 40-43	Construction activities shall avoid land disturbance in ephemeral washes and dry lakebeds; any unavoidable disturbance would be minimized. Stormwater facilities shall be designed to route flow around the facility and maintain pre-project hydrographs.	May not be feasible or necessary to avoid all drainages. Mitigation could accomodate development in certain drainages.
A-53 Lines 22-23	If chemical dust palliatives (suppressants) are used, they shall be selected and applied in accordance with the facilities Dust Abatement Plan.	BLM should standardize the acceptability of palliatives – allowed by some BLM offices but not others.
A-54 Lines 13-14	Water use shall be minimized by implementing conservation practices, such as treating spent wash water and storing it for reuse.	Capturing and storing wash water from a solar facility may have unacceptable cost and environmental consequences. Recovering spent wash water from a PV facility would not be feasible.
A-54 Line 40	Topsoil removed during construction shall be reused during reclamation.	This should be worded to make it clear that storage of topsoil is for reclamation following construction and not reclamation following decommissioning. It would not be practical to store topsoil for the life of the project.
A-55 Lines 11-13	To the extent practicable, projects shall be sited on previously disturbed lands in close proximity to energy load centers to avoid and minimize impacts on remote, undisturbed lands.	Sites that meet these criteria are likely very limited. Perhaps this design feature should simply say that sites that meet these criteria are desirable.
A-56 Lines 5-15	Projects shall be sited and designed to avoid direct and indirect impacts on important, sensitive, or unique habitats	Fully avoiding **any** direct and indirect impacts is usually not feasible. Feature should say that impacts will be avoided where feasible or

Page	Text	Comment
	in the project vicinity, including, but not limited to, waters of the United States, wetlands (both jurisdictional and nonjurisdictional), springs, seeps, streams (ephemeral, intermittent, and perennial), 100-year floodplains, ponds and other aquatic habitats, riparian habitat, remnant vegetation associations, rare or unique biological communities, crucial wildlife habitats, and habitats supporting special status species populations (including designated and proposed critical habitat). For cases in which impacts cannot be avoided, they shall be minimized and mitigated appropriately. Project planning shall be coordinated with the appropriate federal and state resource management agencies.	practical, and will otherwise be mitigated to less than significant, as necessary.
A-57 Lines 17-18	Fences shall be built (as practicable) to exclude livestock and wildlife from all project facilities, including all water sites.	This could conflict with biological interests, in some cases, where it may be desirable to allow wildlife access to the site (wildlife permeable fencing). Fencing to exclude wildlife should be on a case-by-case basis depending on the site and wildlife characteristics.
A-57 Lines 24-25	Developers shall avoid the placement of facilities or roads in drainages and make necessary accommodations for the disruption of runoff.	Avoiding drainages completely is too restrictive; requirement for avoidance should depend on the drainage feature and the potential impact.
A-57 Lines 33-38	Projects shall avoid surface water or groundwater withdrawals that affect sensitive habitats (e.g., aquatic, wetland, and riparian habitats) and any habitats occupied by special status species. Applicants shall demonstrate, through hydrologic modeling, that the withdrawals required for their project are not going to affect groundwater discharges that support special status species or their habitats.	Requirement should not necessarily be to avoid if it can be shown that the impact is less than significant.
A-57 Lines 42-44	The capability of local surface water or groundwater supplies to provide adequate water for the operation of proposed solar facilities shall be considered early in the project siting and design. Technologies that would result in large withdrawals that would affect water bodies that support special status species shall not be considered.	"Large withdrawal" is too general and subjective. Requirement should be site-specific and consider the amount of the withdrawal compared to the water supply available.

Page	Text	Comment
A-59 Lines 16-18	Activities shall be timed to avoid, minimize, or mitigate impacts on wildlife. For example, crucial winter ranges for elk, deer, pronghorn, and other species should be avoided, especially during their periods of use.	Should allow for possibility to mitigate rather than avoid.
A-60 Lines 10-11	Project activities shall not be located in or near occupied habitats of special status animal species. Buffer zones shall be established around these areas.	"Occupied habitat" is too restrictive. Habitat could include foraging habitat, which should not necessarily be precluded from project activities, particularly if the species is not a federal or state threatened or endangered species.
A-65 Lines 7-13	Prior to any ground-disturbing activity, seasonally appropriate walkthroughs shall be conducted by a qualified biologist or team of biologists to ensure that important or sensitive species or habitats are not present in or near project areas. Attendees at the walkthrough shall include appropriate federal agency representatives, state natural resource agencies, and construction contractors, as appropriate. Habitats or locations to be avoided (with appropriately sized buffers) shall be clearly marked.	The purpose and timing of any walkthroughs or surveys is project specific. Protocols and attendance would be determined based on resources present and the project schedule. Agency involvement in any walkthrough would have to be at the agency's discretion, not a requirement of a Design Feature.
A-66 Lines 6-12	Meteorological towers, soil borings, wells, and travel routes shall be located to avoid important, sensitive, or unique habitats, including, but not limited to, wetlands, springs, seeps, ephemeral streams, intermittent streams, 100-year floodplains, ponds and other aquatic habitats, riparian habitat, remnant vegetation associations, rare natural communities, and habitats supporting special status species populations as identified in applicable land use plans or best available information and science.	Avoiding these features is too restrictive and may not be necessary in all situations. Site characterization activities should be conducted in accordance with site conditions and local BLM office guidance.
A-67 Lines 24-26	Open trenches could also entrap smaller animals; therefore, escape ramps shall be installed along open trench segments at distances identified in the applicable land use plan or best available information and science.	The requirement for escape ramps should only apply to sensitive species.
A-67	As directed by the local BLM field office, Joshua trees (*Yucca*	To require salvage of these species, it should be certain that there is a

Page	Text	Comment
Lines 40-44	*brevifolia*), other *Yucca* species, and most cactus species shall be salvaged prior to land clearing, and they shall be transplanted, held for use to revegetate temporarily disturbed areas, or otherwise protected as prescribed by state or local BLM requirements.	demand or need for these species, otherwise there may be no place to relocate these plants.
A-68 Lines 6-7	Reestablishment of vegetation within temporarily disturbed areas shall be done immediately following the completion of construction activities, provided such revegetation will not compromise the function of the buried utilities ….	Revegetation should occur at a seasonably appropriate time to maximize success. "Immediately" following construction may not be optimal if it would occur during the dry season in a desert environment. Best timing for revegetation is likely fall or spring.
A-69 Lines 7-9	The lower 18 in. (46 cm) of the fencing shall be a solid barrier that would exclude entrance by amphibians and other small animals.	Excluding amphibians and other small animals should be determined on a project-by-project basis. It may not always be beneficial to exclude these species.
A-71 Lines 42-45	Habitat disturbance shall be minimized by using helicopters for construction to lessen the need for access roads, and by locating transmission facilities in previously disturbed areas. Existing utility corridors and other support structures shall be used to the maximum extent feasible.	Use of helicopters should not be mandatory in all cases. If there are existing access roads or if roads can be constructed without significantly affecting habitat, surface installation should be allowed.
A-74 Lines 1-2	Newer and cleaner equipment that meets more stringent emission controls shall be leased or purchased.	This needs to be more specific as to what is required. Newest and cleanest may not be necessary in all locations and may not be available. This could unnecessarily add significant costs to a project. This BACT-related requirement necessarily is addressed in project permitting.
A-74 Lines 16-22	All unpaved roads, disturbed areas (e.g., areas of scraping, excavation, backfilling, grading, and compacting), and loose materials generated during project activities shall be watered as frequently as necessary to minimize fugitive dust generation. In water-deprived locations, water spraying shall be limited to active disturbance areas only, and non-water-based dust control measures shall be implemented in areas with intermittent use or use that is not heavy, such as stockpiles or access roads.	Dust palliatives are not allowed by all BLM field offices – non water-based dust control measures shall be implemented – under current practices this may not be allowed.
A-75 Lines 1-2	Wind fences shall be installed around disturbed areas that could affect the area beyond the site boundaries (e.g., nearby	This should only be applicable to significant effects. Mitigating any effect is too costly and unnecessary.

Page	Text	Comment
	residences).	
A-75 Lines 4-8	All soil disturbance activities and travel on unpaved roads shall be suspended during periods of high winds. A critical site-specific wind speed shall be determined on the basis of soil properties determined during site characterization, and monitoring of the wind speed shall be required at the site during construction, operation, and reclamation.	Suspension of activities should be based on inability to mitigate dust, not just because of high winds. High winds during rain or wet soil conditions may not be a problem.
A-76 Lines 9-14	Because of low winds and stable atmospheric conditions occurring in the early morning from late fall to early spring, the highest 24-hour concentrations of particulate matter during construction would be attributable to activities occurring during those hours. Thus, soil disturbance activities should be eliminated or minimized under these atmospheric conditions, particularly for construction activities occurring near facility boundaries.	This is overly restrictive. If dust can be mitigated, construction activities should not be constrained.
A-76 Lines 34-35	Alternative-fuel, electric, or latest-model-year vehicles shall be used, when available, as facility service vehicles.	If the facility has few emissions, as stated above, it is not necessary to restrict vehicle type, particularly in attainment areas.
A-78 Lines 16-20	A qualified and licensed professional landscape architect with demonstrated experience with the BLM's VRM policies and procedures shall be a part of the developer's and the BLM's respective planning teams, evaluating visual resource issues as project siting options are considered. The visual issues shall be addressed throughout the planning and design process, and the final project plans shall reflect intended methods for mitigating visual impacts.	Should allow for visual design specialist without being a licensed landscape architect. This requirement could unnecessarily eliminate qualified individuals or firms.
A-80 Lines 30-33	Project developers shall exhaust opportunities to minimize visual dominance of projects by siting projects outside the viewsheds of KOPs or by siting them as far away as possible, diminishing dominance by maximizing visible separation with distance.	Having to "exhaust opportunities" is not appropriate for a programmatic document. Requirements should be tied to the visual impacts, and should not have to be exhaustive in all situations. Not all KOPs are equally sensitive to visual impacts, and requirements should be evaluated on a project-by-project basis.
A-81 Lines 1-2	Locating facilities near visually prominent landscape features (e.g., knobs and waterfalls) that naturally draw an observer's	Prohibiting placement of facilities near any knob or waterfall, regardless of size or significance is overly restrictive. Small, insignificant features

Page	Text	Comment
	attention shall be avoided.	could unnecessarily preclude development of a project in the area.
A-81 Lines 18-21	Linear developments (e.g., transmission lines, pipelines, roads) shall follow the edges of natural clearings or natural lines of transition between vegetation type, topography, etc. (where they would be less conspicuous) rather than pass through the center of clearings.	Requirements under this design feature should be to the extent practical. Depending on the site characteristics, these requirements could render a project infeasible.
A-81 Lines 26-29	In visually sensitive areas, air transport capability shall be used to mobilize equipment and materials for clearing, grading, and erecting transmission towers, thereby preserving the natural landscape conditions between tower locations and reducing the need for permanent and/or temporary access roads.	Air transport should be used to the extent necessary to reduce visual impacts to less than significant; it may not be necessary in all situations. Construction access would not necessarily require establishment of permanent roads. However, if permanent surface access is required, the use of air transport during construction would not reduce visual impacts.
A-82 Lines 10-15	Where screening topography and vegetation are absent or minimal, natural looking earthwork landforms, vegetative, or architectural screening shall be used to minimize visual impacts. The shape and height of earthwork landforms must be adapted to the surrounding landscape, and must consider the distance and viewing angle from KOPs in order to ensure that the earthworks are visually unobtrusive.	This should be addressed on a project-by-project basis. Screening, particularly with earthwork landforms, may not be practical or necessary in many situations, and the screening itself could have adverse environmental impacts.
A-83 Lines 9-10	Solar panel backs shall be color-treated to reduce visual contrast with the landscape setting.	Requirement should be project- and technology-specific, otherwise it could be adding unnecessary cost to projects.
A-84 Lines 21-22	…. shall not cause excessive reflected glare. Low-pressure sodium light sources shall be used to reduce light pollution. Full cut-off luminaires shall be used to ….	Should not specify a particular type of light (low-pressure sodium) in a programmatic document. Over the life of the document, other lights may be developed that are more appropriate.
A-85 Lines 4-5	Commercial symbols or signs and associated lighting on buildings or other structures shall be prohibited.	Would this mean no project name, company name or logo on buildings or entrance signs? That would seem unnecessarily restrictive.
A-86 Lines 25-26	The visual color contrast of graveled surfaces shall be reduced with approved color treatment practices.	It would seem that color treatment of gravel could be expensive and may need environmental review to determine the impact of the treatment on the environment. Again, this should be considered on a project-by-project basis; it may be unnecessary where gravel surfaces are not visible from sensitive visual locations.

Page	Text	Comment
A-87 Lines 31-33	The project developer shall maintain revegetated surfaces until a self-sustaining stand of vegetation is reestablished and visually adapted to the undisturbed surrounding vegetation.	It is unclear when re-vegetation is expected to occur. Re-establishing vegetation inside of an operating solar power plant can cause problems with facility operations by hampering access to equipment during operations and maintenance.
A-91 Lines 4-5	If residences or sensitive receptors are nearby, noisy equipment, such as turbines and motors, shall be placed in enclosures.	This requirement should be tied to an impact and not just if receptor is "nearby." Impacts on nearby receptors will be dependent on distance, natural noise screening, and ambient conditions.
A-92 Lines 3-8	If a noise from a transformer becomes an issue, a new transformer with reduced flux density, which generates noise levels as much as 10 to 20 dB lower than National Electrical Manufacturers Association (NEMA) standard values, could be installed. Alternatively, barrier walls, partial enclosures, or full enclosures could be adopted to shield or contain the transformer noise, depending on the degree of noise control needed.	"Becomes an issue" needs to be defined. Change out of transformers is a very costly requirement and transformer design should be determined at the permitting stage, not after the fact. If the transformers meet the design criteria, replacement should not be required.
A-95 Lines 16-17	Project developers shall conduct a records search of published and unpublished literature for past cultural resource finds in the area …	How does the BLM propose that a developer conduct a records search of "unpublished" literature? Does this require investigations of oral records with the people of the area? There should be some objective criteria.
A-103 Lines 38-40	Project developers shall survey project sites for unexploded ordnance, especially if projects are within 20 mi (32 km) of a current DoD installation or formally used defense site.	Surveys for unexploded ordinance should only be required in areas where there is evidence of, or a high probability, of occurrence.
A-108 Lines 18-20	Because of the high global warming potential of sulfur hexafluoride (SF_6), the use of alternative dielectric fluids that do not have a high global warming potential shall be required.	If an alternative to SF_6 is required, that alternative should be identified. Additionally, any alternative identified should be demonstrated to be viable through consultation with the electrical industry.
A-126 Table A.2-2 (Cont.)	*Water Resources*: … Land disturbance activities should avoid impacts to the extent possible near the regions surrounding Palen Lake, Ford Dry Lake, and McCoy Wash.	The reference to the term "regions" is extremely broad and could imply that activities that would have no impact on these features should be avoided. In addition, the reference should be to "Palen *Dry* Lake," as it is not an active waterbody.
A-126 Table A.2-2 (Cont.)	*Vegetation*: … All wetland, riparian, playa, dry wash (including dry wash microphyll woodland), sand dune and sand transport areas, and chenopod scrub habitats within	The reference to the maintenance of a "buffer area" is not defined and could be interpreted more broadly than required under applicable federal and state requirements. This reference should be qualified to state that a

Page	Text	Comment
	the SEZ should be avoided to the extent practicable, and any impacts minimized and mitigated. A buffer area should be maintained around wetland, riparian, playa, and dry wash communities to reduce the potential for impacts on these communities on or near the SEZ.	buffer area if required by ACOE/EPA Clean Water Act jurisdiction or CDFG SAA jurisdiction should be maintained.
A-127 Table A.2-2 (Cont.)	*Wildlife (All)*: To the extent practicable, avoid ephemeral drainages, Palen Lake and Ford Dry Lake, wetlands, McCoy Wash, and the Colorado River Aqueduct.	While the language is qualified with reference "[t]o the extent practicable," there should be some recognition that ephemeral drainages are ubiquitous throughout the desert environment of the SEZ and avoidance will be nearly impossible for any site of significant size. As noted previously, the reference should be to "Palen *Dry* Lake."
A-127 Table A.2-2 (Cont.)	*Special Status Species*: Disturbance of desert playa and wash habitats within the SEZ should be avoided or minimized to the extent practicable. In particular, development should be avoided in and near Ford Dry Lake, Palen Lake, and McCoy Wash within the SEZ.	Same comments as previously regarding the practical inability to avoid impacts to "desert playa and wash habitats," ambiguity regarding "in and near" referenced features, and the reference to "Palen *Dry* Lake."
A-128 Table A.2-2 (Cont.)	*Visual Resources:* Within the SEZ, in areas west of the northwest corner of Section 6 of Township 006S Range 017E, and in areas north and west of the northwest corner of Section 30 of Township 005S Range 018E, visual impacts associated with solar energy development in the SEZ should be consistent with VRM Class II management objectives, as determined from KOPs to be selected by the BLM within Joshua Tree NP and the Palen-McCoy WA.	The reference to visual resource impacts associated with Joshua Tree National Park is of concern. The principal problem with the proposed BMP is that it seeks to amend existing designations solely for solar projects when the Visual Resource Inventory (VRI) determination should be based on the resources as opposed to a proposed project. The BMP may be inconsistent with BLM's site-specific VRI findings and therefore not supported by any factual basis. In addition, the KOPs for Joshua Tree NP should be identified in the Solar PEIS, and not left to subsequent BLM "to be determined" discretion.
A-128 Table A.2-2 (Cont.)	*Cultural Resources*: Significant resources clustered in specific areas, such as those in the vicinity of Palen and Ford Dry Lakes, focused DTC/C-AMA activity areas that retain sufficient integrity, and Native American trails evident in the desert pavement should be avoided.	In light of the widespread presence of DTC/C-AMA-associated historic resources (many of which are of marginal historic value), the reference to "avoided" impacts should be qualified by reference to "to the extent practicable." Recovery may be more appropriate in some circumstances.

Thank you for your comment, Katie Umekubo.

The comment tracking number that has been assigned to your comment is SEDDsupp20179.

Comment Date: January 27, 2012 20:49:14PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20179

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Comment Submitted:

NATURAL RESOURCES DEFENSE COUNCIL

January 27, 2012

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Delivered via web form and US Postal

Re: Comments on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States, 76 Fed. Reg. 66958-66960 (October 28, 2011)

Dear Director Abbey:

The Natural Resources Defense Council (NRDC) appreciates the opportunity to submit these comments in response to the Supplement to the Draft Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States, released on October 28, 2011. NRDC is a national, nonprofit organization of scientists, lawyers and environmental specialists dedicated to protecting public health and the environment. Founded in 1970, NRDC has more than 1.3 million members and online activists nationwide, served from offices in New York, Washington, D.C., Chicago, Los Angeles, San Francisco and Beijing. These comments are intended to supplement the broader sets of comments already submitted by NRDC and our partners.

For more than three decades, NRDC has been deeply engaged in efforts to protect the publicly-owned lands and resources under the jurisdiction of the Bureau of Land Management (BLM). More recently we have been intensively involved in the efforts of the BLM and the Department of the Interior to process and review proposals to construct and operate utility-scale solar energy power plants on public lands, particularly in California, and to develop a sound environmentally responsible program for managing the solar resources found on those lands. We appreciate the decision to modify the preferred solar energy development program alternative that was described in the Draft PEIS in response to public comment and especially the commitment to zone-based development, both of which are reflected in the Supplement to that draft. We firmly believe that, given the impacts of utility-scale solar development, an approach that guides such development to the most appropriate places is essential to increasing access to and use of solar energy while protecting the unique and sensitive resources of our public lands.

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While the preferred program alternative that is presented in the Supplement is much improved over the alternative in the Draft, several issues require additional attention, as detailed in these comments.

1. **Measures should be adopted to better include and inform the public in managing BLM's solar resources.**

With the release of the Supplement, NRDC greatly appreciates the time and investment that the BLM made in providing additional details regarding the composition of the revised solar energy zones (SEZs). This was evident on the day the Supplement was released, when BLM established on its website a document bank that provided opportunities for the public to download key geospatial information datasets along with a suite of additional maps depicting the revised SEZs. It cannot be overly stressed how important it is to provide stakeholders these types of data, particularly given the challenges that stakeholders encounter in relation to the process of evaluating the suitability and veracity of proposed programmatic measures as incorporated within the Supplement. Such data are instrumental in being able to fully evaluate the scope of a proposal, and can often lead to greater consensus driven outcomes given that the full range of stakeholders are properly informed.

To ensure that stakeholders are fully engaged, we believe that there are a few instrumental measures that the BLM should implement as the agency adopts a programmatic framework to site and permit solar projects:

a. *A full commitment to transparency calls for the BLM, at minimum, to develop and maintain one authoritative, publicly available list of active solar project right-of-way (ROW) applications—including notice of any change in pending, closed, and approved ROW application status.* While we commend the BLM for attempting to publish an authoritative list of active ROW applications in the Supplement,[1] the BLM still does not maintain a centrally-hosted, authoritative list of all ROW applications—active or not. The lack of such a list is a severe impediment to public engagement in the management of our public lands.

b. *The BLM should centrally provide and host up-to-date Geographic Information Systems (GIS) boundaries of all pending ROW applications.* In NRDC's attempt to evaluate the revised SEZs, conservation areas, and developable areas, we attempted to analyze how these changes comported with active ROW applications and with the reconstituted SEZs. But since the February 2011 termination of public access to BLM's Legacy Rehost 2000 System (LR2000) GIS server, it was fundamentally impossible to form empirically sound conclusions about the footprint of ROW applications given that publicly available ROW

[1] Per a joint comment letter that NRDC has signed with members of the solar industry and other stakeholders, we understand that some applications that appear to be pending have been omitted from this list. Those applications are detailed in that letter.

data was invariably obsolete.[2] The lack of definitively sanctioned and accurate GIS ROW data forces stakeholders to, at best, make educated suppositions regarding how ROW applications fit into the programmatic proposals that are put forward in the Supplement. More problematically, the lack of accurate and publicly available ROW data undermines the tenets of a comprehensive solar program, by creating potentially false conclusions about the suitability of individual ROW applications.

c. *The BLM should provide data to stakeholders that fully encapsulate the range of electrical transmission lines, existing and prospective, which intersect with the SEZs, pending projects and the developable area.* The analysis provided in the PEIS and the Supplement is not adequate in illustrating this essential component. Without transmission data, the current Supplement and draft PEIS provide a theoretical notion of how development might arise, but it is an incomplete picture that in many cases imparts developmental scenarios that are simply improbable. By demonstrating the transmission interconnections that exist, or may exist in the future, within prospective areas for solar development,[3] stakeholders will be provided one of the more fundamentally important pieces necessary to assess the suitability of prospective development while ensuring that investments are made where there is the greatest chance for success based upon the availability of transmission capacity.[4]

2. The Modified Program Alternative would provide ample room for solar to grow responsibly and thrive sustainably on our public lands.

The BLM, the Interior Department, and the Energy Department are to be commended for including a Reasonably Foreseeable Development Scenario (RFDS) in the draft Solar Energy Development PEIS, thereby providing a reasonable basis for projecting the *maximum* development that might occur for the purpose of projecting impacts at the programmatic level—while also demonstrating that the RFDS was sufficient to meet BLM's goals for the production of solar energy from public lands. Our previously submitted joint comments on the PEIS included an independent review of the RFDS analysis. That analysis demonstrated that the PEIS' RFDS was overly aggressive both in terms of amount of renewable energy needed in the study area through 2030, and in terms of the amount of solar energy the public lands might provide to meet that need.[5] At that time, we concluded that precisely because the RFDS is so aggressive, it clearly documents that the SEZ alternative—supplemented by a system for

[2] As expressed in our previous PEIS comments, NRDC encountered a series of significant inconsistencies in the agency's data regarding ROW applications. The lack of timely hosted data is perpetuated within the Supplement.
[3] *Appendix 1* includes maps that depict current and prospective transmission lines within the key SEZs and developable area.
[4] Further in *Appendix 2* are specific recommendations and conclusions regarding how additional transmission analysis should be incorporated within the PEIS.
[5] *See* Appendix I, *Response to the Draft Programmatic Environmental Impact Statement for Solar Energy Development*, submitted on May 1, 2011 by The Wilderness Society, Natural Resources Defense Council, et al.

designating additional zones as needed, as we previously advocated for—would allow more than enough acreage for solar to be sited on federal lands managed by the BLM.

BLM's release of a modified program alternative in the Supplement precisely underscores this ample availability of acres available to meet projected demand for solar energy development on our public lands. In Section 2.3.1.7, the Supplement references the RFDS' estimation of 24,000 MW of solar energy generation over the 20-year study period, along with a corresponding allocation of approximately 214,000 acres (866 km2) of BLM-administered lands in order to meet such a generation target. Such demand is met by both action alternatives as outlined in the Supplement—the land area needed to meet the estimated RFDS for solar development accounts for roughly 1% of the land area available for application under the modified program alternative, and 75% of the land area available for development within SEZs alone. Thus, there can be little doubt that the modified program alternative would meet projected demand for solar energy development within the given timeframe established by the draft PEIS.

3. The technical criteria provided for slope and insolation exclusion areas are reasonable parameters for the highest and best use of our public lands.

We support the technical criteria relating to slope and insolation that were applied by the BLM. We also are supportive of the biological and cultural criteria that were used to identify high solar value lands that may be appropriate for utility-scale development—i.e. the variance lands. Changes to the technical criteria should only be made, if at all, *in very limited circumstances* to avoid or minimize resource conflicts in order to preserve the architecture and goals of the program proposed in the Supplement.[6]

In PEIS Sections 2.2.2.2 and 6.1, BLM explained that the technical criteria—limiting lands available for utility-scale to those with slopes of less than 5% and those with a minimum solar insolation level threshold of 6.5 kWh/m2/day—were based on the characteristics of the solar energy technologies evaluated along with assumptions regarding the economic viability of such development. Such criteria are a key element of our shared goal of "screening for success," which is meant to allow time and resources to be directed to those projects that have the greatest chance of success. In addition, it should be noted that, under the program proposed in the Supplement, BLM would entertain requests to reconsider both the slope and the insolation criteria in connection with proposals for new solar energy zones (SEZs).

Adherence to the stated criteria will help maximize the efficient use of BLM-administered lands and meet the multiple use mandate of the Federal Land Policy and Management Act of 1976 (FLPMA)—by reserving for other uses public lands that are not well-suited for solar energy development. In addition, retaining those criteria for variance lands will avoid triggering the

[6] This discussion is not meant to discount our willingness to consider and support a pilot project or other modest measures that incorporate additional flexibility in the technical criteria process, provided that all requirements under the National Environmental Policy Act and the Federal Land Planning and Management Act of 1976 are strictly adhered to, appropriate restrictions are imposed, and the need for and the potential efficacy of such a proposed change can be substantiated. Two such modest exceptions were included in the joint environmental-industry letter referenced above in Footnote 1.

preparation of another supplement and/or exposing the Department to additional management liabilities that could result in crippling conflicts that could undermine the BLM's obligations in managing these resources.

a. **Wholesale alterations of the slope and insolation exclusion area designations would involve millions of acres.**

Slope and insolation exclusion area criteria are highly significant factors in assessing solar energy development on BLM lands, roughly accounting for over 60 million acres. The no action alternative totals approximately 97.6 million acres; the no action alternative excluding conservation, wildlife and ROW restrictions totals approximately 82.9 million acres; and the development alternative, which adds the slope and insolation exclusion area restrictions, totals approximately 20.3 million acres.[7] *Figure 1* provides a rough demonstration of the possible magnitude of change if slope criteria were to be altered with respect to lands being considered.

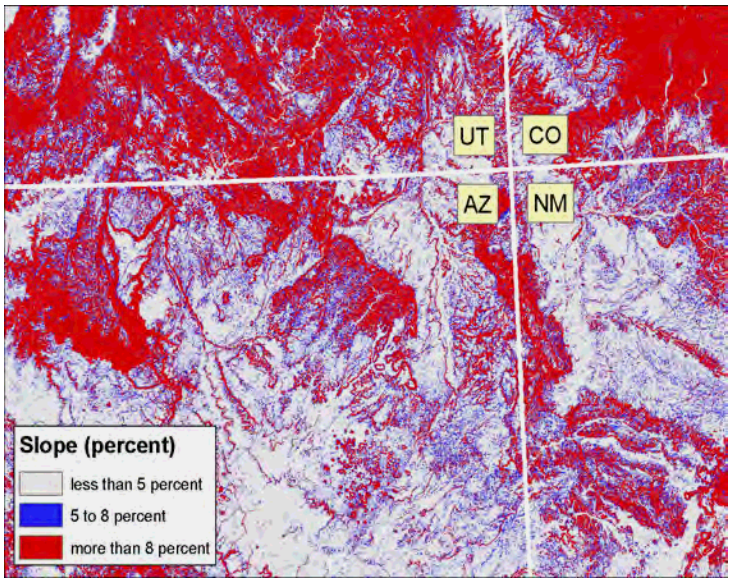


Figure 1: This map depicts slope variation near the four corners region. As can be seen, a considerable area is found to incompatible with current solar development scenarios based upon slope considerations in this region. The blue lands with slope between five and eight percent are seen to border the red areas of higher slope. The slope or gradient across the six states considered in the BLM Solar Development PEIS was calculated from the NASA Shuttle Radar Topographic Mission (STRM) Digital Elevation Model (DEM) at 3 arc second (approximately 90 meter) resolution.

Similarly, *Table 1* depicts the projected effect of considering lands with relatively small changes to slope *and* solar insolation levels. The most noticeable factor in this case is altering solar insolation levels—holding the slope constant at less than 5% while adding lands with solar

[7] For this analysis we used the GIS datasets provided by BLM at the Solar Energy Development Programmatic EIS website (http://solareis.anl.gov/index.cfm).

insolation between 6 and 6.5 kWh/m2/day suggests an addition of 12.4 million acres. Combining the totals of each of these limited changes would suggest the likely inclusion of 22.2 million additional acres within the current Development Alternative, as depicted in *Figure 2*.

Table 1: Alternative Slope and Insolation Scenarios

Insolation	< 5% Slope	5% - 8% Slope
6 - 6.5 kWh/m2/day	12.4 MILLION ACRES	3.6 MILLION ACRES
> 6.5 kWh/m2/day	CURRENT DEVELOPMENT ALTERNATIVE	6.2 MILLION ACRES

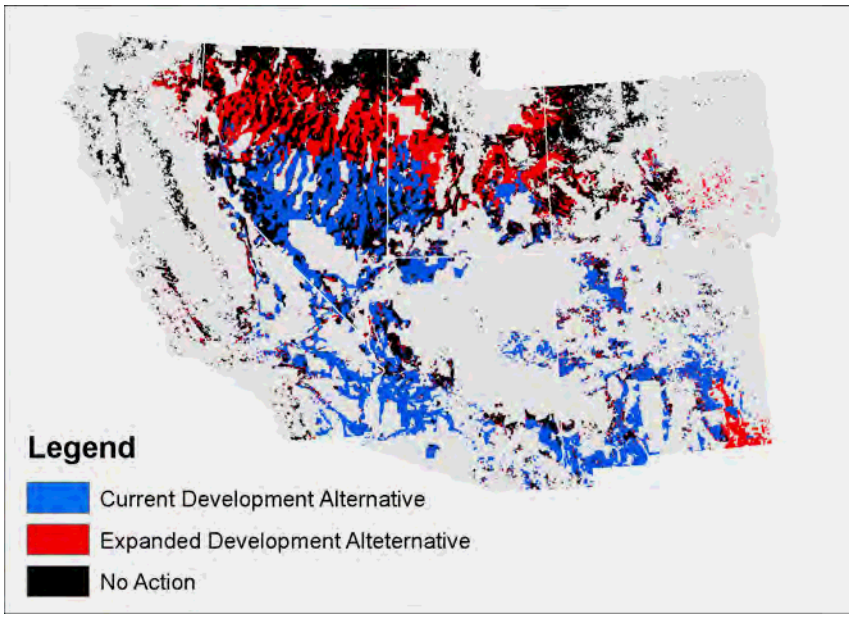


Figure 2: This map demonstrates the projected combined effect of considering lands with minimal changes to slope and solar insolation levels—including lands with up to 8% slope and between 6 and 6.5 kWh/m2/day solar insolation suggests the possible inclusion of 22.2 million acres to the current Development Alternative. Data used were provided by the BLM at the Solar Development PEIS website. The slope or gradient across the six states considered was calculated from the NASA Shuttle Radar Topographic Mission (STRM) Digital Elevation Model (DEM) at 3 arc second (approximately 90 meter) resolution.

To summarize, by increasing slope and/or insolation values, the effects of such a prescription would incite a multitude of difficulties—problems that could very likely undermine and jeopardize the effective management of solar resources. For one, there is little or no evidence that such changes are viable at a technological scale given the current conditions that define utility-scale solar development. The best solar resources, married to the best solar technologies, may not benefit from an alteration of current proposed slope and isolation paradigms. On the contrary, development within such areas could likely result in solar authorizations unable to

sustain themselves economically—which puts the resource and the goals of a BLM solar program at risk.

More critically, altering these values would place millions of acres of lands and their resources at risk, risk that has not been evaluated at all to date. For example, allowing development on slopes above 5% will implicate different wildlife and plant species, different soil types and different hydrologic regimes, none of which have been identified or addressed in the NEPA process to date. These upslope lands too are expected to be critically important for climate change adaptation.

Finally, instead of concentrating development near suitable areas and adjacent to infrastructure, the opening of these acres would perpetuate a piecemeal approach that could scatter development across landscapes on lands that are likely to be unsuitable based on ecological reasons.

4. **The approach to transmission analysis utilized in the Supplement needs to be changed.**

Transmission is an essential ingredient for a successful SEZ. To their credit, the Interior Department and BLM attempted to respond in the Supplement to requests from the solar industry and others for more information on transmission in connection with proposed zones and with future zones. Unfortunately, the approach taken is inherently flawed and, equally importantly, seems to assume that BLM should engage in the transportation planning business, rather than find a way to integrate transmission and land use planning considerations into the process of identifying, evaluating and designating new zones.

NRDC contracted with Aspen Environmental Group, a well known consulting company, to take a look at the "Methodology for Conducting Enhanced Transmission Assessment" that was developed for and tested in connection with the Supplement. Their report is attached as *Appendix 2*. It documents the flaws in the approach used in the Supplement, including the failure to consider critical factors.

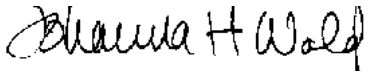
BLM is a land management agency. It cannot now develop the needed information about transmission and it should not be expected to. Rather than develop and analyze such information, the Bureau should obtain it from transportation planning entities such as the Western Electricity Coordinating Council (WECC). Indeed, BLM very appropriately submitted a study request to WECC earlier this month regarding the SEZs proposed in the Supplement.

The real challenge for the Bureau and the Department is to integrate the transmission information they receive from WECC and others with land use considerations, such as exclusion areas and other land use conflicts between potential SEZs and potential markets. We are eager to work with the BLM and potentially others to develop an approach that could be used to integrate land use and transmission considerations in such a way as to provide information that is useful not just to BLM but also to developers, utilities and other stakeholders.

Conclusion

Thank you again for your commitment to zone-based solar development and to the establishment of a comprehensive and environmentally responsible framework for managing the solar resources of the public lands. Thank you also for considering these comments. If you have any questions, please do not hesitate to contact us.

Sincerely,



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Appendix 1: Solar ROW Mapping Update

In our original comments on the Solar PEIS, dated May 2, 2011, NRDC submitted a report entitled *Bureau of Land Management Utility-Scale Solar Applications: A Geospatial Survey of Active ROW Applications*. The report was a Geographic Information Systems (GIS) assessment in which NRDC analyzed and mapped 166 right-of-way (ROW) boundaries for proposed and authorized utility-scale solar projects on Bureau of Land Management (BLM) lands in California, Nevada, New Mexico and Arizona. NRDC prepared the report to provide a single, contemporary snapshot of ROW applications likely to be considered active by solar developers and the BLM. Included here is an update to that report, providing a geospatial snapshot of active solar ROW applications within the context of revisions to the solar energy zones and variance area designations, as well as incorporating additional transmission data.

The following maps include the 79 active ROW applications identified in Appendix A of the Supplement to the Draft Solar Program EIS, as well as those applications included on BLM's Approved and 2011/2012 Priority Projects lists.

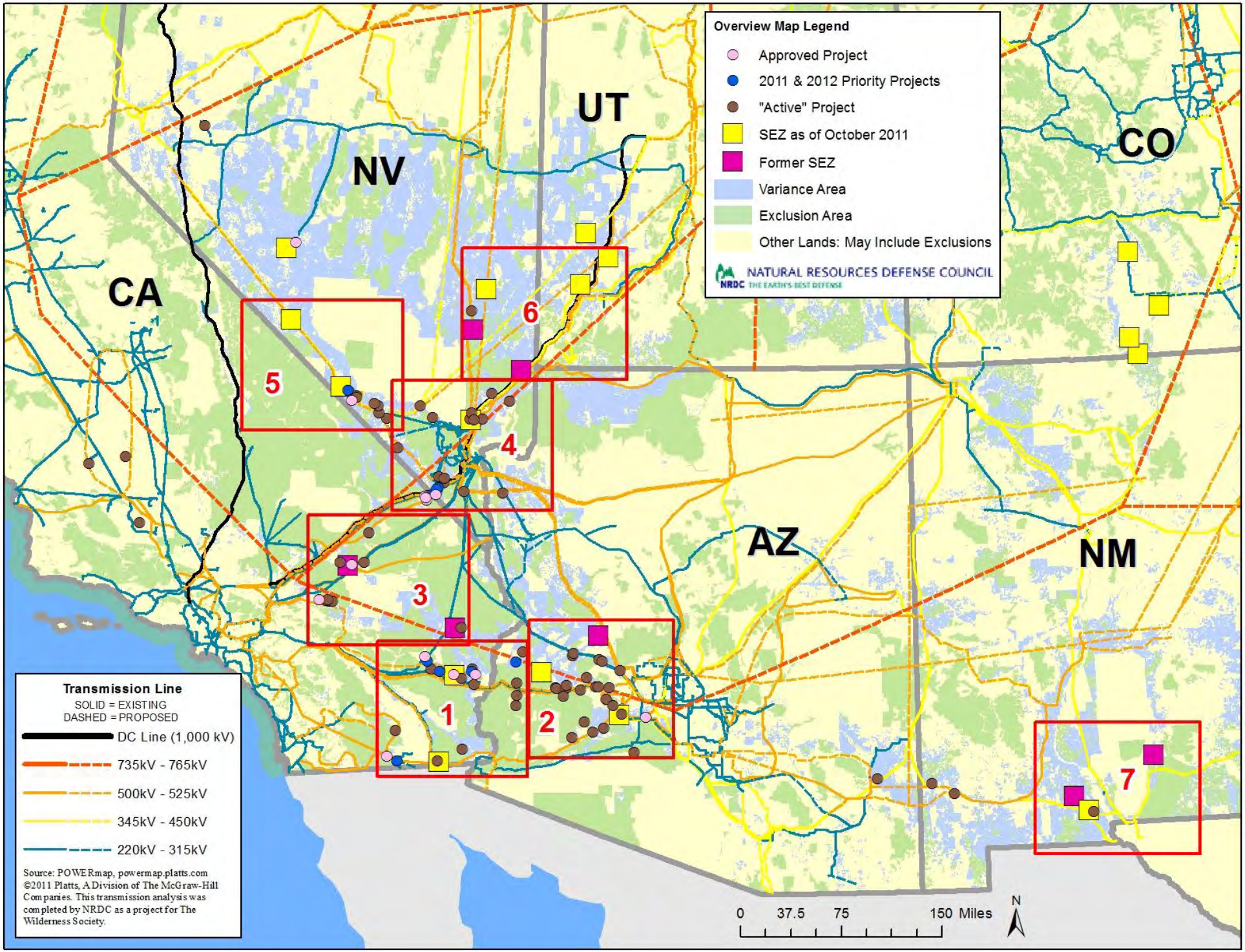
The following data layers were used to compile these maps (accessible at: http://solareis.anl.gov/maps/gis/index.cfm):

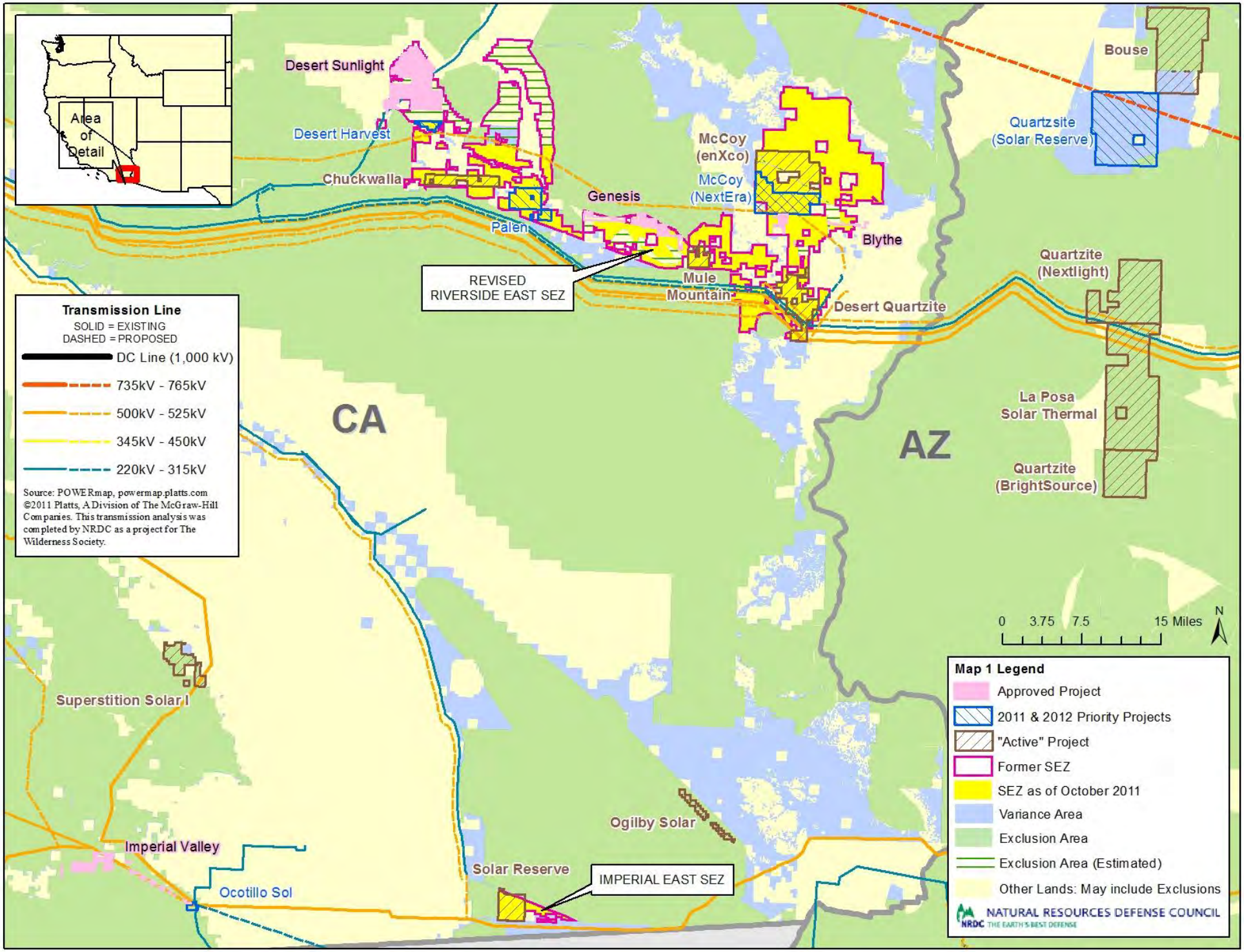
- Modified BLM Alternatives Group (SEZ PEIS Proposed, Modified SEZ Alternative and Variance Areas)
- Protected Resources Group (ACEC, National Monument, Roadless Area, Specially Designated Area, SRMA, Wilderness, Wilderness Study Area, Wild and Scenic River, NSO, ROW Avoidance, ROW Exclusion)
- Flora Critical Habitat, Fauna Critical Habitat, Fauna/CDCA (DWMA, Flat-Tailed Horned Lizard Habitat, Fringe-Toed Lizard Habitat, Mojave Ground Squirrel Habitat)

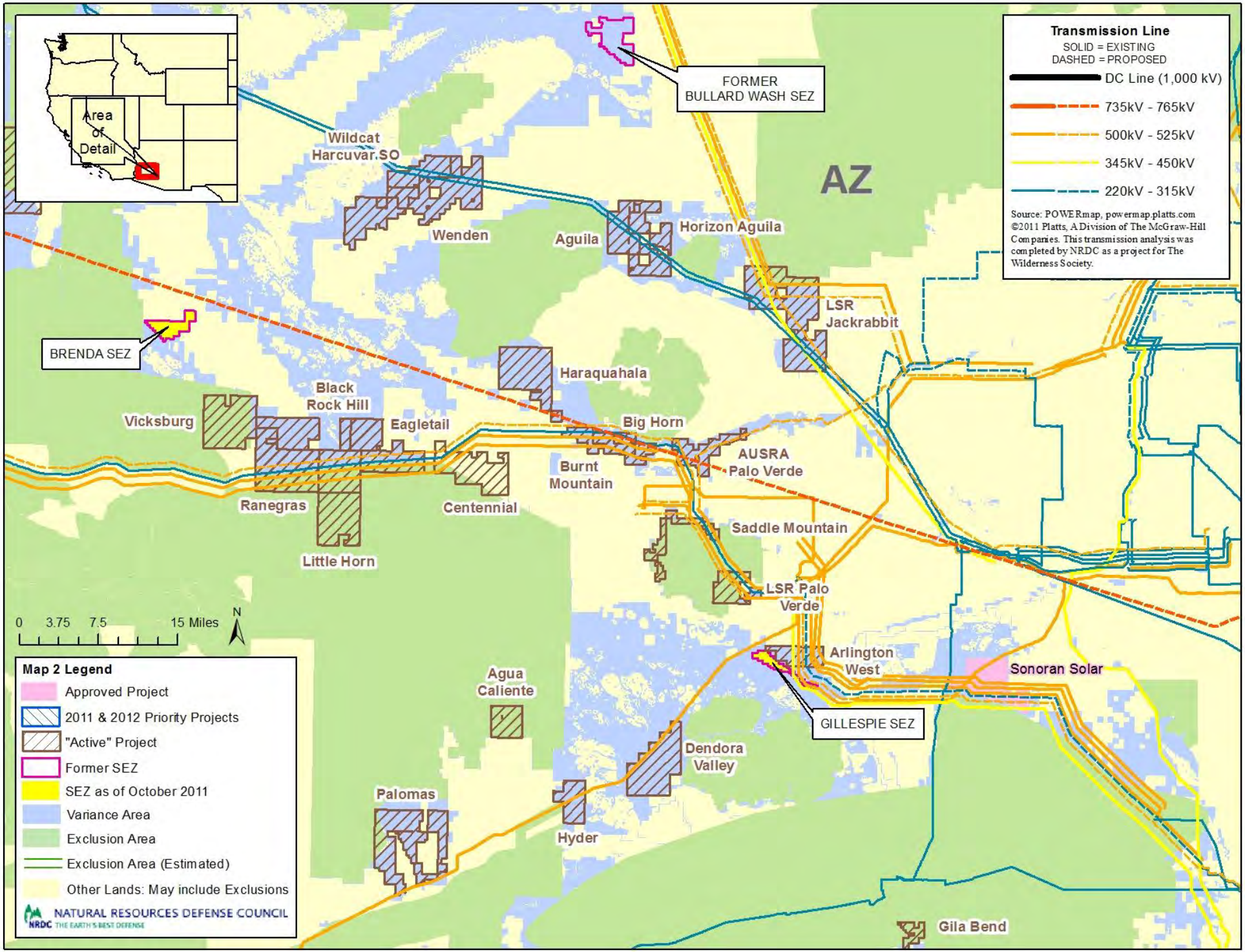
The GIS data for ROW boundaries, as well as depicted land designations were downloaded from BLM's Legacy Rehost 2000 System (LR2000) and ArcIMS service, found at www.geocommunicator.gov, prior to the data being removed from the public website in late February 2011. In addition, transmission data was incorporated from Platts POWERmap as part of a project conducted by NRDC for The Wilderness Society. Additional exclusion area data from other available sources for the proposed Mojave Trails National Monument was also incorporated.

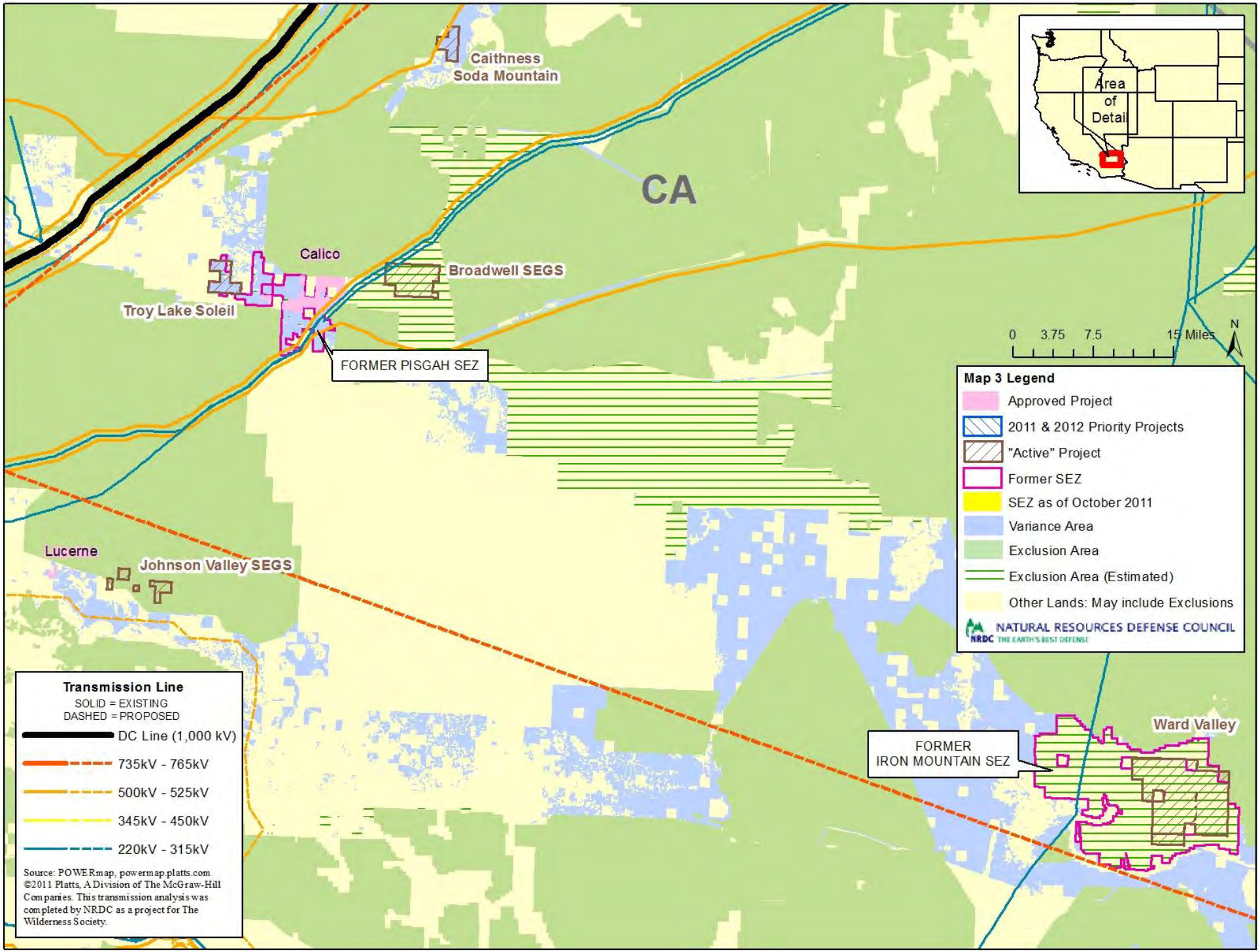
As we previously commented on the Draft PEIS, NRDC's analysis was hampered by inconsistencies with BLM's data—similar problems persist with the Supplement. Due to the fact that some of BLM's legacy data sets had these embedded inconsistencies, we caveat that the data layers used here are the most recent GIS data that was available to the public. Inconsistencies with revised solar energy zone maps and ROW boundary acreage estimates, as provided in the PEIS Supplement, are acknowledged.

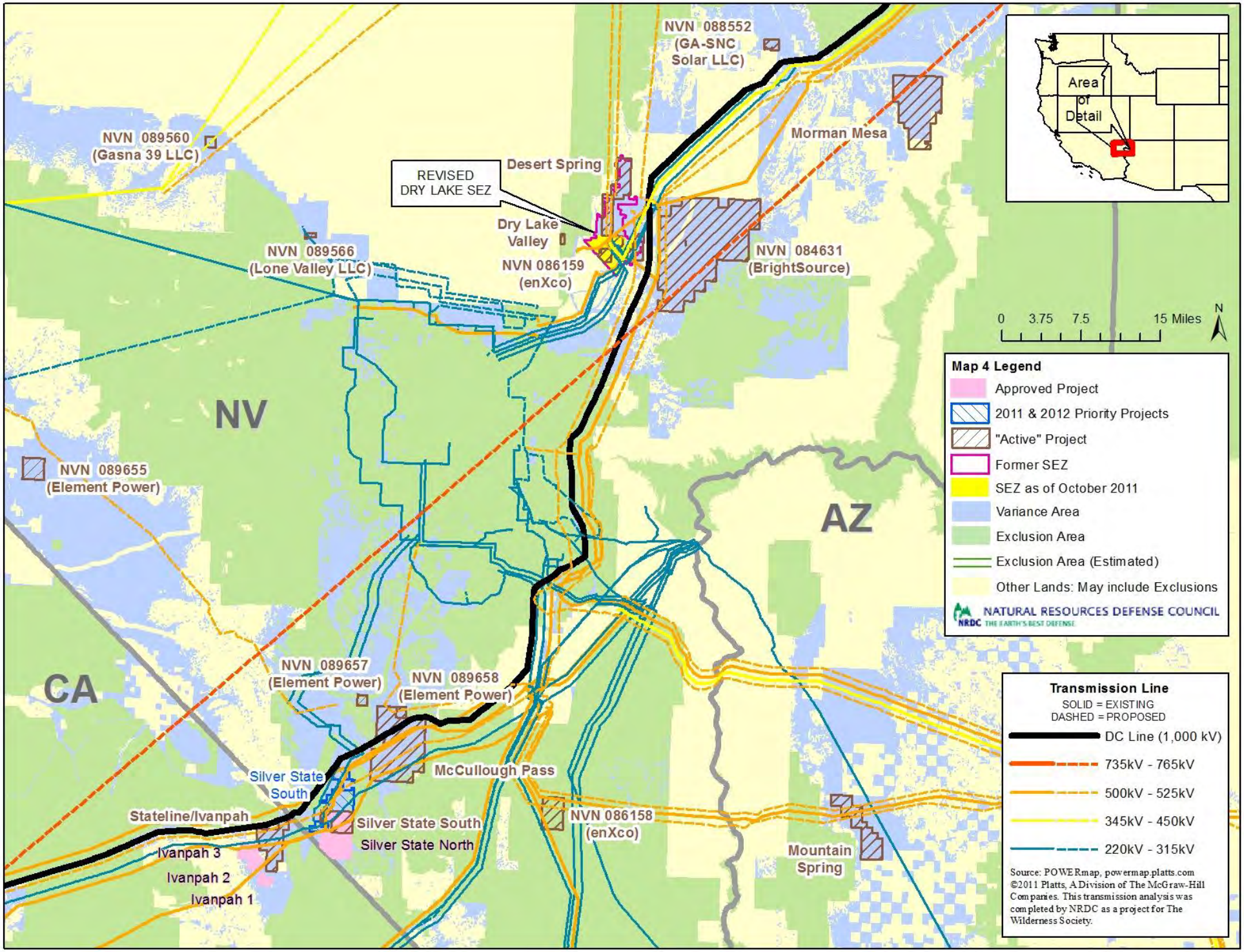
This work was performed by Rachel Fried, Bobby McEnaney, Matthew McKinzie, and Katie Umekubo of NRDC's Lands and Wildlife Program.

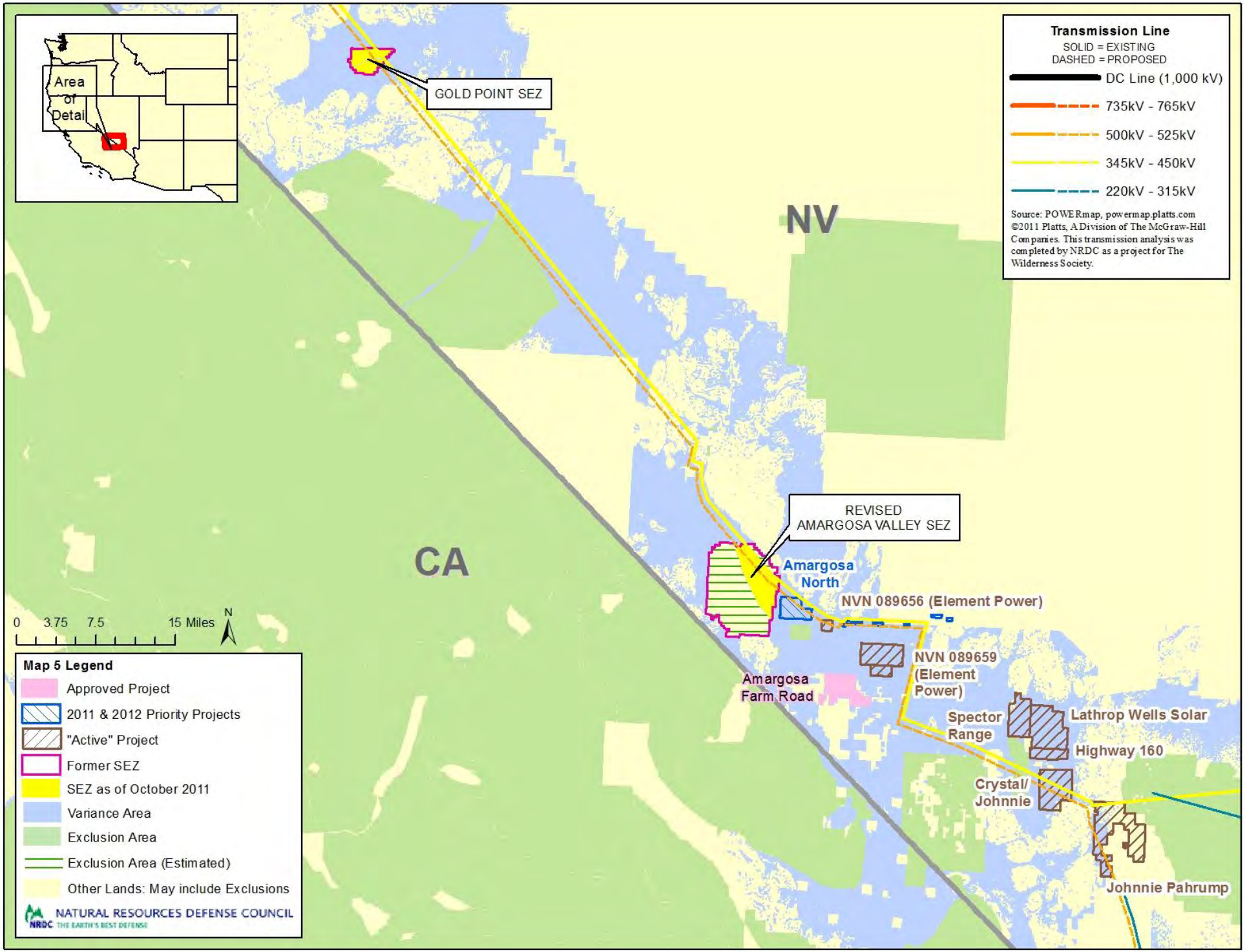

Overview Map Legend
Approved Project
2011 & 2012 Priority Projects
"Active" Project
SEZ as of October 2011
Former SEZ
Variance Area
Exclusion Area
Other Lands: May Include Exclusions
NATURAL RESOURCES DEFENSE COUNCIL
NRDC THE EARTH'S BEST DEFENSE
CA
NV
UT
CO
AZ
NM
1
2
3
4
5
6
7
Transmission Line
SOLID = EXISTING
DASHED = PROPOSED
DC Line (1,000 kV)
735kV - 765kV
500kV - 525kV
345kV - 450kV
220kV - 315kV
Source: POWERmap, powermap.platts.com
©2011 Platts, A Division of The McGraw-Hill Companies. This transmission analysis was completed by NRDC as a project for The Wilderness Society.
0 37.5 75 150 Miles
N

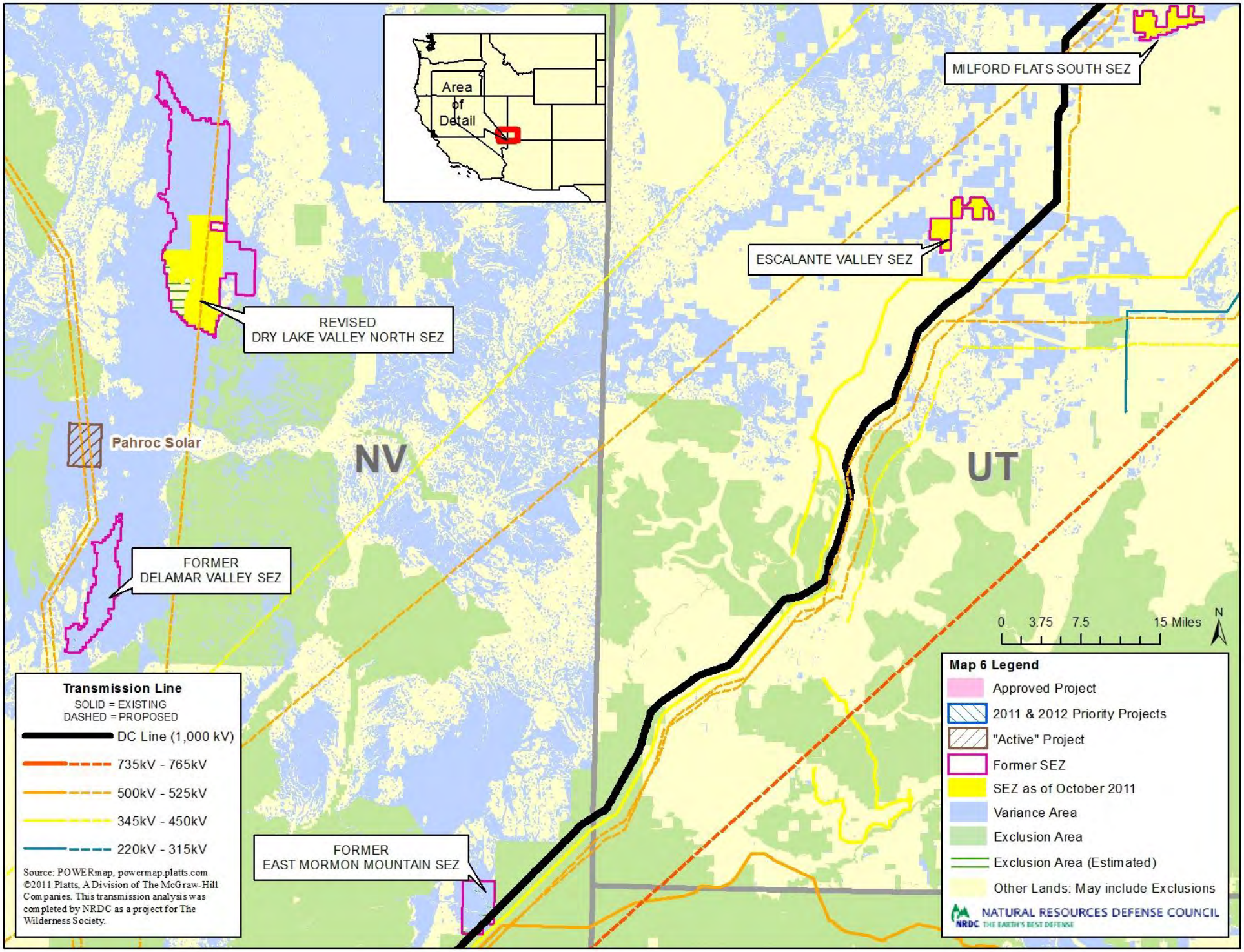

Area of Detail
Desert Sunlight
Desert Harvest
Chuckwalla
Genesis
Palen
McCoy (enXco)
McCoy (NextEra)
Blythe
Mule Mountain
REVISED RIVERSIDE EAST SEZ
Bouse
Quartzsite (Solar Reserve)
Quartzite (Nextlight)
Desert Quartzite
La Posa Solar Thermal
Quartzite (BrightSource)
CA
AZ
Transmission Line
SOLID = EXISTING
DASHED = PROPOSED
DC Line (1,000 kV)
735kV - 765kV
500kV - 525kV
345kV - 450kV
220kV - 315kV
Source: POWERmap, powermap.platts.com ©2011 Platts, A Division of The McGraw-Hill Companies. This transmission analysis was completed by NRDC as a project for The Wilderness Society.
0 3.75 7.5 15 Miles
N
Superstition Solar I
Imperial Valley
Ocotillo Sol
Ogilby Solar
Solar Reserve
IMPERIAL EAST SEZ
Map 1 Legend
Approved Project
2011 & 2012 Priority Projects
"Active" Project
Former SEZ
SEZ as of October 2011
Variance Area
Exclusion Area
Exclusion Area (Estimated)
Other Lands: May include Exclusions
NATURAL RESOURCES DEFENSE COUNCIL
NRDC THE EARTH'S BEST DEFENSE

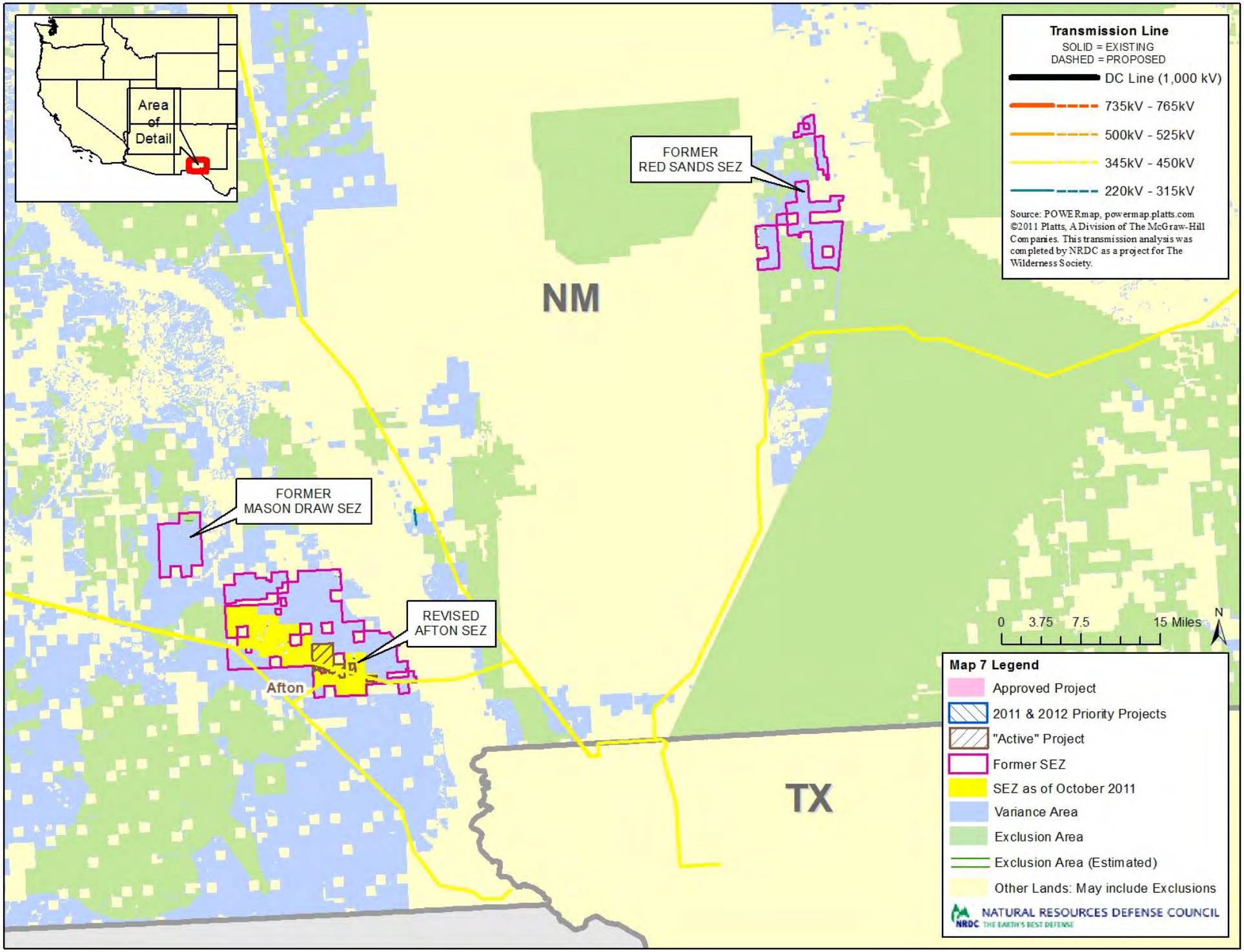

Area of Detail
FORMER BULLARD WASH SEZ
Wildcat
Harcuvar SO
Wenden
Aguila
Horizon Aguila
AZ
LSR Jackrabbit
BRENDA SEZ
Haraquahala
Black Rock Hill
Vicksburg
Eagletail
Big Horn
AUSRA Palo Verde
Burnt Mountain
Ranegras
Centennial
Saddle Mountain
Little Horn
LSR Palo Verde
Arlington West
Sonoran Solar
Agua Caliente
GILLESPIE SEZ
Dendora Valley
Palomas
Hyder
Gila Bend
0 3.75 7.5 15 Miles
N
Transmission Line
SOLID = EXISTING
DASHED = PROPOSED
DC Line (1,000 kV)
735kV - 765kV
500kV - 525kV
345kV - 450kV
220kV - 315kV
Source: POWERmap, powermap.platts.com ©2011 Platts, A Division of The McGraw-Hill Companies. This transmission analysis was completed by NRDC as a project for The Wilderness Society.
Map 2 Legend
Approved Project
2011 & 2012 Priority Projects
"Active" Project
Former SEZ
SEZ as of October 2011
Variance Area
Exclusion Area
Exclusion Area (Estimated)
Other Lands: May include Exclusions
NATURAL RESOURCES DEFENSE COUNCIL
NRDC THE EARTH'S BEST DEFENSE


Caithness
Soda Mountain
CA
Area
of
Detail
Calico
Broadwell SEGS
Troy Lake Soleil
FORMER PISGAH SEZ
0 3.75 7.5 15 Miles
N
Map 3 Legend
Approved Project
2011 & 2012 Priority Projects
"Active" Project
Former SEZ
SEZ as of October 2011
Variance Area
Exclusion Area
Exclusion Area (Estimated)
Other Lands: May include Exclusions
NATURAL RESOURCES DEFENSE COUNCIL
Lucerne
Johnson Valley SEGS
Ward Valley
FORMER
IRON MOUNTAIN SEZ
Transmission Line
SOLID = EXISTING
DASHED = PROPOSED
DC Line (1,000 kV)
735kV - 765kV
500kV - 525kV
345kV - 450kV
220kV - 315kV
Source: POWERmap, powermap.platts.com
©2011 Platts, A Division of The McGraw-Hill Companies. This transmission analysis was completed by NRDC as a project for The Wilderness Society.


NVN 088552
(GA-SNC
Solar LLC)
Morman Mesa
NVN 089560
(Gasna 39 LLC)
REVISED
DRY LAKE SEZ
Desert Spring
Dry Lake
Valley
NVN 089566
(Lone Valley LLC)
NVN 086159
(enXco)
NVN 084631
(BrightSource)
Area
of
Detail
0 3.75 7.5 15 Miles
N
NV
AZ
CA
NVN 089655
(Element Power)
NVN 089657
(Element Power)
NVN 089658
(Element Power)
McCullough Pass
Silver State
South
Stateline/Ivanpah
Silver State South
Silver State North
Ivanpah 3
Ivanpah 2
Ivanpah 1
NVN 086158
(enXco)
Mountain
Spring
Map 4 Legend
Approved Project
2011 & 2012 Priority Projects
"Active" Project
Former SEZ
SEZ as of October 2011
Variance Area
Exclusion Area
Exclusion Area (Estimated)
Other Lands: May include Exclusions
NATURAL RESOURCES DEFENSE COUNCIL
NRDC THE EARTH'S BEST DEFENSE
Transmission Line
SOLID = EXISTING
DASHED = PROPOSED
DC Line (1,000 kV)
735kV - 765kV
500kV - 525kV
345kV - 450kV
220kV - 315kV
Source: POWERmap, powermap.platts.com
©2011 Platts, A Division of The McGraw-Hill Companies. This transmission analysis was completed by NRDC as a project for The Wilderness Society.


Area of Detail
GOLD POINT SEZ
NV
CA
REVISED AMARGOSA VALLEY SEZ
Amargosa North
NVN 089656 (Element Power)
NVN 089659 (Element Power)
Amargosa Farm Road
Spector Range
Lathrop Wells Solar
Highway 160
Crystal/ Johnnie
Johnnie Pahrump
0 3.75 7.5 15 Miles
N
Transmission Line
SOLID = EXISTING
DASHED = PROPOSED
DC Line (1,000 kV)
735kV - 765kV
500kV - 525kV
345kV - 450kV
220kV - 315kV
Source: POWERmap, powermap.platts.com ©2011 Platts, A Division of The McGraw-Hill Companies. This transmission analysis was completed by NRDC as a project for The Wilderness Society.
Map 5 Legend
Approved Project
2011 & 2012 Priority Projects
"Active" Project
Former SEZ
SEZ as of October 2011
Variance Area
Exclusion Area
Exclusion Area (Estimated)
Other Lands: May include Exclusions
NATURAL RESOURCES DEFENSE COUNCIL
NRDC THE EARTH'S BEST DEFENSE


Area of Detail
MILFORD FLATS SOUTH SEZ
ESCALANTE VALLEY SEZ
REVISED
DRY LAKE VALLEY NORTH SEZ
Pahroc Solar
NV
UT
FORMER
DELAMAR VALLEY SEZ
FORMER
EAST MORMON MOUNTAIN SEZ
0 3.75 7.5 15 Miles
N
Transmission Line
SOLID = EXISTING
DASHED = PROPOSED
DC Line (1,000 kV)
735kV - 765kV
500kV - 525kV
345kV - 450kV
220kV - 315kV
Source: POWERmap, powermap.platts.com
©2011 Platts, A Division of The McGraw-Hill Companies. This transmission analysis was completed by NRDC as a project for The Wilderness Society.
Map 6 Legend
Approved Project
2011 & 2012 Priority Projects
"Active" Project
Former SEZ
SEZ as of October 2011
Variance Area
Exclusion Area
Exclusion Area (Estimated)
Other Lands: May include Exclusions
NATURAL RESOURCES DEFENSE COUNCIL
NRDC THE EARTH'S BEST DEFENSE


Area of Detail
FORMER RED SANDS SEZ
NM
FORMER MASON DRAW SEZ
REVISED AFTON SEZ
Afton
TX
Transmission Line
SOLID = EXISTING
DASHED = PROPOSED
DC Line (1,000 kV)
735kV - 765kV
500kV - 525kV
345kV - 450kV
220kV - 315kV
Source: POWERmap, powermap.platts.com ©2011 Platts, A Division of The McGraw-Hill Companies. This transmission analysis was completed by NRDC as a project for The Wilderness Society.
0 3.75 7.5 15 Miles
N
Map 7 Legend
Approved Project
2011 & 2012 Priority Projects
"Active" Project
Former SEZ
SEZ as of October 2011
Variance Area
Exclusion Area
Exclusion Area (Estimated)
Other Lands: May include Exclusions
NATURAL RESOURCES DEFENSE COUNCIL
NRDC THE EARTH'S BEST DEFENSE

Aspen Environmental Group

January 23, 2012

235 Montgomery Street, Suite 935, San Francisco, CA 94104-3002
Tel. 415-955-4775, Fax 415-955-4776, www.aspeneg.com

To: Johanna Wald, NRDC

From: Susan Lee & Emily Capello, Aspen Environmental Group

Subject: Comments on Supplemental Draft Solar PEIS, Transmission Methodology

Appendix 2: Solar Energy Zones and Transmission Lines

Attached are Aspen's comments on the transmission methodology presented in the Supplemental Draft of the Solar PEIS.

Solar Energy Zones and Transmission Lines

A. Background

This analysis evaluates the methodology proposed for conducting enhanced transmission assessments for proposed solar energy zones (SEZs), as presented in the Supplemental Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (Solar PEIS).

Draft Solar PEIS Consideration of Transmission. The Draft Solar PEIS considered transmission in the following manner:

- It identified the nearest transmission lines available for each SEZ in Sections 8.1 through 13.3. The Draft PEIS assumed at least some of the solar energy developed would be transmitted over the nearest existing transmission line; however, the Draft PEIS assumed that for full build out, all SEZs would require additional transmission.
- It assumed a transmission line segment would be constructed from the SEZ to the nearest existing transmission line for initial build out of the SEZ. It assumed the ROW width would be less than 250 feet including additional width needed for construction. It was unclear whether access roads or other required disturbance areas (e.g., pull sites, laydown areas) for the transmission lines were included in the calculation of disturbance area.
- It identified generic transmission line impacts in Chapter 5 and generic transmission line mitigation measures, and it also noted that each transmission line upgrade or new transmission line would require separate NEPA compliance documentation.
- In addition, three appendices of the Draft PEIS addressed transmission:
    - Appendix D identified the nearest transmission corridors for each SEZ (between 0 to 39 miles) and regional transmission initiatives;
    - Appendix F summarized the West-wide Energy Corridor PEIS description of activities required for construction, operation, and decommissioning of transmission lines; and
    - Appendix G included a Transmission Constraint Analysis.

B. Consideration of Transmission in the Supplemental Draft Solar PEIS

The Supplemental Draft Solar PEIS (SDSPEIS) proposed a revised methodology that would be implemented in the Final Solar PEIS to better quantify transmission impacts. The SDSPEIS does not define the impacts that would result from the transmission interconnections; these would be presented in the Final Solar PEIS. The SDPEIS does present a test case analysis for the proposed Brenda SEZ to demonstrate the types of additional information that would be included in the Final Solar PEIS.

The Supplemental Draft Solar PEIS attempts to quantify transmission capacity and need for the SEZs and establishes a methodology for analysis of the potential impacts of and need for transmission for a SEZ.

We appreciate the effort put into development of the transmission methodology in the SDPEIS, because defining logical and real transmission corridors for each SEZ is essential to the viability of a SEZ. Some aspects of the proposed methodology are valuable. However, some the methods proposed in the Supplemental Draft PEIS are extremely problematic, and would result in an illogical and inaccurate transmission build-out scenario.

Our major concerns about the methodology proposed for use (and illustrated with Brenda SEZ Analysis) are the following:

- **Definition of load area characteristics**. The population estimates at the load centers are inaccurate. There is no consideration of the fact that most load areas would be served by more than one SEZ (and other types of renewable resources). Information regarding demand for solar resources required by each load center did not include the analysis of load areas' local RPS requirements so the likelihood of transmission being required to serve a load area may be overstated. As such, the broad assumption that solar resources would provide 20 percent of the load requirement for renewable resources is unrealistic. For example, the San Diego load center (with California RPS requirements) should have a very different load profile for use of renewable resources than would Phoenix, Tucson, or Las Vegas.
- The use of non-traditional methods to determine available capacity on the existing transmission system is problematic, and results in inconsistent results in comparison to the numerous ongoing transmission planning processes. The methodology used thermal ratings for the lines rather than path ratings, which can give very different results. For example, in Nevada the On-Line or South SWIP lines have a thermal rating of 2,000 MW but in fact, only 600 MW can be carried safely.
- The methodology ignores transmission usage cost issues or delivery cost issues (rate pan-caking) and does not consider operating limitations of electric system. The analysis should not assume that the electric system can use all the rated power on the system as the availability of a particular line is dependent on the entire system and varies on a regular basis. Operating characteristics of each potential line should be considered, including the direction of generation and load.
- The methodology does not consider that the electric system may not be able to accommodate the delivery of solar resources without downstream transmission infrastructure enhancements and ancillary services.
- The analysis does not address the quality of resource and other competitive issues such as recognizing that some SEZs would be potentially competing for the same markets or market access points.
- The methodology does not consider how states will actually be most likely to meet their RPS requirements (e.g., an NREL study [1] determined that most western States will meet their RPS needs with in-state resource and sell excess prime resources out of state).
- The analysis assumes that "Planned transmission facilities" will be available for use by SEZs. This assumption does not recognize that many of the planned transmission lines illustrated on local or federal planning maps will not be built.
- The methodology does not recognize land use limitations of existing corridors (e.g., narrow areas with constraints limiting future lines). The assumption that a new transmission line can be added parallel to any existing corridor is not always correct.

C. Suggested Revisions to Transmission Methodology

Components to be Retained. While some components of the methodology proposed in the SDSPEIS would result in illogical conclusions, some of the considerations defined in the algorithm are valuable and should be retained in any methodology for identifying transmission considerations for proposed and

[1] Renewable Resources and Transmission: Needs and Gaps. Southwest Renewable Energy Transmission Conference. May 21, 2010. [online at:] http://www.azcc.gov/images/presentations/NREL/Hurlbut%20NREL.pdf

future SEZs and identifying associated impacts. The following components of the methodology proposed in the SDSPEIS should be retained:

- Identification of potential markets
- Distance to markets
- Use of existing corridors
- Existing capacity in transmission lines

While the components listed above should be retained, we recommend that the methods used to determine each of these items be revised as noted below.

Other Components to be Considered. A number of general factors should be included in the transmission analysis of any existing or proposed SEZ. The transmission requirements for a particular SEZ and the impacts associated with transmission lines will be driven by general information about the SEZ while the system in which the renewable energy is being proposed as well as by issues relating to the deliverability of the energy in the SEZ.

General Factors. The general factors are the following:

- **Size and Capacity of Potential SEZ.** Defining the size and potential capacity of each SEZ, so the appropriate transmission need is considered.
- **Applicable State and Federal Requirements.** Defining state RPS and other local or federal requirements that drive the demand for renewable energy near the SEZ.
- **Potential Markets and Distance to Market/Market Access Point.** Identifying the potential markets for the renewable energy generated in the SEZ, and then defining the substation market access points through which that energy has to pass. The likely market access point may not be within the urban areas; it would be a major substation that provides access to the urban load centers. The length of the transmission line to market access points would help determine land use impacts, because length and corridor width can be used to determine acres of impact.
- **Competing Renewable Resources.** Defining whether there are competing renewable resources that might increase or decrease the likelihood of transmission development between a SEZ and a load center.
- **Competing or Complimentary SEZs.** Defining whether there are other SEZs that may either limit the development of the SEZ under consideration based on intervening locations or having similar resource quality and positioning.

Transmission Deliverability. After the market factors have been defined, the deliverability of the energy or ease of building transmission to the SEZ should be established. Specifically in evaluating a SEZ, the following factors should be considered:

- **Transmission Requirements to Access Markets.** Identifying relative transmission costs and complexity to access the defined markets, including currently existing transmission capacity and transmission systems, if available.
- **Existing/Expandable Corridors.** Defining existing designated corridors and existing transmission lines (de facto corridors) and the relative likelihood of whether these corridors can be expanded for new lines.

- **Existing Transmission Line Capacity/Constraints.** Defining the likelihood of available existing transmission line capacity and constraints to using the available capacity.
- **Transmission Queue.** Considering the transmission queue between applicable substations.

We are aware that it's not easy to define available capacity in existing lines. Ideally, the transmission queue should reveal useful information, but determining how a queue would use available capacity is difficult without a system impact study or the required technical expertise and data. However, the DOE could conduct an analysis that demonstrates how to best use existing transmission capacity to access potential markets.

D. Conclusion

Much of the information described above can be obtained with relative ease. The Interior Department and Bureau of Land Management should work with other agencies, and specifically transmission planning entities, to obtain the types of information specifically identified by this assessment. By adopting these recommendations, the BLM will be able to maximize the agency's limited resources in directing development to those areas that will have the greatest chance for success.

Thank you for your comment, claudia sall.

The comment tracking number that has been assigned to your comment is SEDDsupp20180.

Comment Date: January 27, 2012 21:14:48PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20180

First Name: claudia
Middle Initial:
Last Name: sall
Organization:
Address: 54919 skyline ranch rd
Address 2: po box 37
Address 3:
City: pioneertown
State: CA
Zip: 92268
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: BLM_Solar SPEIS_Comments_Claudia_27Jan2012.DOC

Comment Submitted:

please see attached comment letter.

Claudia Sall
PO Box 37
Pioneertown, CA 92268

January 27, 2012

Draft Solar Energy Programmatic EIS
Argonne National Laboratory
9700 S. Cass Avenue – EVS/240
Argonne, IL 60439

RE: Public comments on the Supplement to the Draft Solar Energy Programmatic Environmental Impact Statement [PEIS]

Attn: Bureau of Land Management and Department of Energy

Several years ago the Secretary of the Interior announced that the Department would become a prominent player in the development of renewable energy generation on 22 million acres of public lands in the Southwest. Shortly afterward, BLM was inundated with applications for landscape scale development of renewable energy projects in remote regions of the California Desert. Citizens protested about the impact that such industrialization would have on the ecological integrity of the region and contended that such widespread development mandated an integrated NEPA investigation. BLM complied and began examining the wind and solar development, although in separate actions, not as the comprehensive examination requested by citizens.

In this effort, BLM employed a strategy of creating solar energy zones [SEZs] where solar development would be concentrated and where solar projects would avoid public lands with high conservation value. Citizens and organizations representing collective voices of citizens have actively engaged in PEIS process for the past 3 years and those 22 million acres were refined into SEZ's to a fraction of that acreage. We have reasonably expected that the refining of the SEZs was nearing completion, that is, until pink and blue variance lands began appearing on the maps of the Supplemental PEIS and the Preferred Alternative.

Upon examination of those areas, we have learned that the Bureau is putting all original 22 million acres back onto the table, still allowing solar development in those "non-SEZ" public lands on a "case by case" basis and thereby, effectively negating the NEPA work and independent science analysis that has been going on these past 3 years. These pink and blue lands have known wildlife corridors that preserve the biodiversity health of major protections blocks in the California Desert, i.e. Mojave National Preserve, Joshua Tree National Preserve, and Death Valley National Preserve. Moreover, the Bureau has lumped lands of low conservation value with lands of unknown conservation value, a practice that must stop. Adding insult to injury, they have also placed lands donated with private tax dollars to the federal government and with the intent of conservation onto the renewable-energy auction block. These actions by the BLM are serious breaches of the public trust and have raised issues that must be redressed.

I remind BLM that the Solar PEIS was initiated as a response to the American public's request for fair play and thoughtful planning for renewable energy development on their public lands. BLM's focus of the Solar PEIS thus began as an effort to discover appropriate areas of low conservation value, to determine what and where was needed for solar development, and to refine that acreage into appropriate areas agreed upon by public consensus.

Therefore, I oppose the "No-Action" Alternative and the present, altered version of the Preferred Alternative of the Solar PEIS. In addition, I request that

- the pink and blue variance areas be removed,
- that the unknown conservation lands be removed from the same category as the "low conservation" lands
- and that the unaltered Preferred Alternative worked on by citizens and stakeholders be restored.

Claudia Sall
Citizen of the California Desert

Thank you for your comment, Steven Belinda.

The comment tracking number that has been assigned to your comment is SEDDsupp20181.

Comment Date: January 27, 2012 21:23:03PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20181

First Name: Steven
Middle Initial: R
Last Name: Belinda
Organization: Theodore Roosevelt Conservation Partnership
Address: PO Box 1945
Address 2:
Address 3:
City: Red Lodge
State: MT
Zip: 59068
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: FINAL-Supplemental Solar PEIS comments.pdf

Comment Submitted:

SPORTSMEN FOR
Responsible Energy Development

January 27, 2012

Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue—EVS/240
Argonne, IL 60439

RE: Comments to the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

To Whom It May Concern:

Please accept the following comments from the Sportsmen for Responsible Energy Development (SFRED) coalition, represented by the organizations signed below, on the Bureau of Land Management's (BLM) and the Department of Energy's (DOE) proposed **Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (SPEIS).** SFRED supports the public process underway as our nation moves forward in seeking responsible ways to develop our enormous solar potential on public lands in the West.

Sportsmen for Responsible Energy Development (SFRED) is a coalition of hunting, fishing and conservation organizations and individuals who represent the wide spectrum of America's outdoor community that support and promote responsible energy development on public lands. We are dedicated to the stewardship of America's landscape to help expand fish and wildlife habitat and increase public access to quality hunting and fishing. Our primary concern with any proposal to develop projects on federal lands is based on the needs of fish and wildlife and those who pursue fish and game for recreation and subsistence.

These comments supplement our organizations' previous comments on the Draft PEIS submitted in April 2011 and address only those new issues found in the Supplemental Draft PEIS (SPEIS). Our comments also include issues, concerns, and recommendations developed from sportsmen and conservation organizations who participated in the Sportsmen for Responsible Energy Development "Sportsmen Speak on Solar" forum held in Las Vegas on November 30, 2011. This forum had over 25 national, regional, and local conservation organizations represented and over 50 individuals participating, many of those groups have signed on to support these comments.

We would like to thank BLM for addressing some issues that we raised in our original comments and providing more detail and direction on how solar energy zones will be authorized and implemented. We also applaud BLM for identifying and committing to regional mitigation plans

and areas that will be excluded. We are also pleased to see that BLM is making a very conscientious effort to eliminate those zones that do not have production potential for industry and those that cannot immediately export the electricity produced due to lack of transmission capacity. This has made the existing Solar Energy Zones (SEZ) presented in the SPEIS more acceptable to sportsmen and will provide building blocks for considering new zones in the future.

The following are our specific comments on the details of the SPEIS and our concerns and recommendations for solar energy production on BLM lands that should be addressed in the Final PEIS.

Proposed Solar Energy Zones

The reduction in acreage and zones in the SPEIS is a positive effort to only include those areas that will have the least conflict with other uses and values, be attractive to industry for actual production of solar energy, and be able to immediately link to existing or soon-to-be-built transmission lines. As this is a programmatic document intended to set policy for solar production, the inclusion of SEZ and their subsequent authorization could be problematic. BLM has done a good job of screening the zones and efforts to further refine the SEZ should continue through to the Final PEIS. In addition, we recommend the BLM implement the recent BLM IM 2012-039 (*Identification and Uniform Mapping of Wildlife Corridors and Crucial Habitat*, or CHAT) released January 1, 2012 and effective immediately. This new directive is pursuant to a Memorandum of Understanding (MOU) with the Western Governors' Association and their ongoing coordination among Federal agencies and states to provide better information about priority habitats. As for future SEZ, the process should follow a similar process for establishment and refinement. Positive developments within the SPEIS include:

- Reduction of acreage for SEZ from 677,000 acres to 285,000 acres
- Reduction in availability outside zones from 21.6 Million acres to 20.3 Million acres
- Increased projected utilized acreage from 31.6% to 75% = efficient use of designated SEZ
- 24,000 MW of energy that is not produced by fossil fuels
- Reduction of SEZ from 24 to 17
- Optimized linkage to existing or real transmission

Recommendations

1. Continue to screen proposed SEZ and pending applications for Solar Right of Ways (ROW) to provide enough acreage for solar energy production, with the ability to link to transmission lines, in the least conflicting areas with fish and wildlife resources and values.

2. Create additional screening criteria for the inclusion of impacts to recreation of public lands that will be affected by the development of SEZ. Recreation must include hunting, fishing, and other fish and wildlife related activities.
3. Only designate areas for SEZ that will be utilized for solar energy production and strive to keep a 75% utilization rate of lands designated as SEZ. This will minimize the amount of needed acres for solar production and eliminate the problems with lands being held for future development without real intention for production (speculation).
4. Delay taking any new applications for Solar ROW until the Final PEIS and Record of Decision (ROD) is signed. By continuing to accept ROW applications, BLM is creating a workload problem and may run into problems with implementation of the ROD. This will also build trust with other public land users who have experienced inadequate decisions resulting in significant impacts from the BLM during oil and gas leasing and development.
5. Include in the Final PEIS an analysis of those areas outside of the SEZ that will experience reduced access for hunting and shooting activities because of buffers or "no shooting zones".

Handling of Existing Solar Applications

We are concerned that the current solar project applications, pending or authorized, will have inadequate guidance frameworks for siting, evaluation, monitoring, and enforcement of environmental quality control. Due to the uniqueness of solar development and the limited research on its environmental impacts, we remain concerned that the "grandfathering" of 79 applications and more than 685,000 acres under current management direction is problematic. A primary concern of ours is the effects on groundwater and surface water sources. In addition, the determination of the priority for processing these previous applications will have an impact on the availability of Agency personnel needed to work on new applications within the approved SEZ.

We support the concept of solar energy development but we must be realistic about the potential direct and indirect impacts that can occur. The use of parabolic trough and central tower systems requiring steam plants for their electricity source require relatively large volumes of water. Water sources in a desert environment remain scarce and highly valuable, especially for fish and wildlife species. With the unknown impacts concentrated solar power facilities would have on temperature variations and associated effects to the surrounding habitat, we recommend that all pending and pre-approved applications under current policies include commitments for rigorous monitoring, reporting, and research in order to minimize and correct any indicated problems.

Regional Mitigation Plans

We are very pleased to see the BLM commit to mitigation as part of the SPEIS, but we have concerns with the certainty of implementation and the funding required to conduct successful mitigation of impacts. We have observed mitigation being used by many agencies, including the BLM, as a "justification" for authorizing energy development on sensitive wildlife areas. However, these mitigation efforts often lack a rigorous, science-based mitigation program that has effectively allowed for resources to be sustained, as promised, throughout development. The worst-case example is the Pinedale Anticline natural gas project in western Wyoming where mule deer and sage-grouse declines have occurred beyond acceptable levels. Although millions of dollars have been spent on mitigation there is no evidence that the impacts have been offset, alleviated or replaced. Mitigation can be very expensive, particularly if you have a large magnitude impact on species that have specialized habitat needs or in arid environments.

Recommendations

1. Completion of Regional Mitigation Plans for each region (can be defined within the Final PEIS) and actions that will be part of any SEZ authorization ***within 6 months*** of the ROD for the Final PEIS. These plans should include population or habitat objectives and impact thresholds for each focus species or habitat and <u>also include mitigation for impacts to recreation and loss of access to public lands.</u>
2. Regional Mitigation Plans should be based on current guidelines for mitigation published by the Council for Environmental Quality (CEQ) . This includes a commitment to science-based, structured mitigation plans that are based on a "value-for-value" approach.
3. Regional Mitigation Advisory Teams should be constructed with members consisting of affected stakeholders, industry, government (Federal, State, Local), and external scientists. These advisory teams should be in place within 6 months of the Final PEIS and ROD or within 6 months of each new SEZ being authorized.
4. Mitigation trust accounts should be established for each Regional Mitigation Plan that will be used to carry out mitigation activities. Funding for each trust account should be identified in the Final PEIS.
5. For solar energy activities that are tiered to the Final PEIS, the CEQ guidelines for mitigation during NEPA planning should be followed if activities are authorized using a Finding of No Significant Impact.

Exclusion Areas

We support the BLM's approach to identifying areas of public lands where solar energy will not be a suitable use. This approach will provide certainty for industry and allow for other multiple-use resource values to be managed without fear of impacts from solar energy. Our organizations have advocated and promoted the identification of "special areas" that are too valuable to develop and the BLM's strategy is congruent with that approach. We understand

the need for some flexibility in these areas based on changing conditions but it must be used very carefully and with public consideration of the tradeoffs.

Recommendations

1. Provide more details for the exclusion areas to eliminate any confusion or misinterpretation of values or areas that will be included.
2. Include high value and high use recreation areas, including those areas that are deemed irreplaceable or "world class" for fish and wildlife habitat or hunting and fishing activities.
3. Provide for a systematic monitoring process and review for exclusion areas every 5 years with stakeholder involvement.
4. Incorporate other processes being developed to identify important fish and wildlife values such as the Western Governors Association's sponsored Critical Habitat Assessment Tool (CHAT) and state fish and wildlife agencies' developed Decision Support Systems.
5. Provide detailed status maps via a designated website for the exclusion areas and the reason they are being excluded from solar development.

Variance Process

We understand the desire to have a process in place for the development of solar energy outside of those SEZ identified in the PEIS. We also understand the BLM's need to comply with the Federal Land Policy and Management Act (FLPMA) requirements for the identification of suitable uses for lands through the Resource Management Plans (RMPs) for BLM administered lands. We have concerns, however, based upon BLM's experience with oil and gas leasing and development, that similar mistakes may be made in the authorization of public lands for solar energy development. It is for that reason that we strongly support the designation of SEZ. The variance process as set forth in the SPEIS could undermine the value of SEZ. We are concerned that many of the factors identified in the variance process need only be "considered" by BLM. We are concerned that the process does not emphasize the value of meaningful public involvement. We are also concerned that the variance process will result in never ending planning and NEPA documents, which take up needed resources and funding for other management needs.

Recommendations

1. Require advanced public and outside government stakeholder notification and meetings similar to pre-proposal meetings with BLM, as identified in the Final PEIS.
2. Clarify when the variance process will be employed and how the BLM will make the information available for public review and comment.
3. Require an annual meeting within each state that reports on any new applications for solar development that will be disclosed to the public.
4. Post all variance requests and affiliated documents on each state BLM office's website within 30 days of receipt.

5. Outline how BLM will entertain changes to the variance process and how often the variance process will be reviewed or revised. We recommend a thorough review every 5 years
6. Applicants should be required to meet some of the factors listed for consideration, including the viability of the project and that it will have little or no impact on other public lands resources, before a variance will be granted.

Adaptive Management

The BLM's historical application of adaptive management for energy development has been largely inadequate. We understand the flexibility and advantages of using a scientific adaptive management approach to land management but have concerns that given the lengthy time commitment, the large geographic area devoted to solar energy production, and the lack of technical options for producing solar energy that adaptive management may not be the best approach. We do not advocate using an adaptive management approach in the Final PEIS, but if BLM chooses to keep this approach we recommend the items below.

Recommendations

1. Review the applicability of the use of adaptive management for solar energy through the advice of experts in adaptive management – both within federal government and external sources.
2. Provide clear guidance and instruction on how adaptive management will be applied to BLM lands used for solar energy. This includes how adjustments to operations will be made, how monitoring will be conducted and funded, how annual review cycles will be held, timelines to be met and what authorizations or uses will be changed based on monitoring results.
3. Follow DOI handbook on Adaptive Management and other guiding documents available in published literature.
4. Establish an adaptive management review team, including external experts, which will have the responsibility and authority to ensure successful implementation of adaptive management.
5. Create a webpage available to the public that posts current and relevant information of the implementation of the adaptive management program.

Public/Stakeholder Involvement

Public lands belong to all Americans and are held in trust for the public by the BLM. Hunters, anglers, and other public land users are stakeholders in the management of public lands and must be engaged early and often in the policy discussions and decision making processes. BLM has done a good job to date on the SPEIS and that effort must continue as SEZ are authorized, exclusion areas are identified, mitigation plans are made, and the variance process takes shape.

Recommendations

1. Require the public to be notified on all implementation of solar energy development on public lands via the Internet, local media sources, and other avenues for notification.
2. Develop a dedicated webpage for the implementation, mitigation, and variance process for solar development on public lands.
3. Make all data used for decisions, monitoring, and variance processes available in a timely manner to the public for download and use.
4. Hold annual review meetings on the implementation and mitigation actions of solar development on public lands.
5. Develop specific stakeholder groups, including sportsmen and conservation organizations, that can work with industry at the local or regional level.

Wildlife

The management of habitat is extremely important for the future of fish and wildlife on public lands. In addition to habitat concerns, applying professional wildlife management practices and ensuring access to public lands for research and recreation is also of importance. Sensitive species and other important habitats should be identified and considered for exclusion areas. Important surface and groundwater sources must be protected. Mitigation plans must meet the needs of fish and wildlife and habitat should be linked to populations and objectives for each set in coordination with state and federal fish and wildlife agencies. Of particular concern are sage-grouse, mule deer, desert bighorn sheep.

Recommendations

1. Identify important fish and wildlife habitats and migration/movement corridors for each region in coordination with federal and state fish and wildlife agencies and by utilizing CHAT.
2. Avoid all irreplaceable habitats or other areas where solar development would have irreparable impacts to fish and wildlife.
3. Develop a process to link habitat management on public lands to state population objectives for game species like deer, elk, bighorn sheep, and upland game birds.
4. Develop a regular review process for reviewing the fish and wildlife management activities taking place in conjunction with solar energy development and how to include future science and information into land management.
5. Identify gaps in knowledge or science for the impacts on fish and wildlife from solar energy development and assist with funding research projects to address those gaps.

Sage-Grouse

1. Develop a process for inclusion of any future federal, state, or local management planning for sage-grouse on public lands including adjustments that may result from federal protection due to an Endangered Species Act listing.

2. Adjust the habitat mitigation ratio from 1:1 (which is not adequate to ensure sustainable sage-grouse populations and is not based on science) to a more appropriate value-for-value ratio based on current science or other mitigation (i.e. – Fish and Wildlife Coordination Act).
3. Ensure that sport hunting for sage-grouse is not closed or restricted due to solar energy development on public lands.

Mule Deer

1. Identify key mule deer migration and movement routes in addition to other key habitats (winter, parturition) and avoid impacts to these habitats that would impair their continued productive use by mule deer.
2. Implement the recommendations contained within the 2011 Western Association of Fish and Wildlife Agencies Mule Deer Working Group publication, "Energy Development Guidelines for Mule Deer."
3. Implement the recommendations contained within the 2011 Theodore Roosevelt Conservation Partnership report, "Mule Deer and Energy: Federal Policy and Planning in the Greater Green River Basin."
4. Develop a Memorandum of Understanding with the Mule Deer Foundation and other conservation groups on mule deer management on public lands within each region affected by solar energy development.
5. Ensure that mule deer hunting or access to mule deer hunting are not closed or restricted due to solar energy development on public lands.

Bighorn Sheep

1. Identify key bighorn sheep migration and movement routes in addition to other key habitats (winter, parturition) and avoid impacts to these habitats that would impair their continued use by bighorn sheep.
2. Adhere to any specific bighorn sheep management plans that are developed by the state fish and wildlife agencies.
3. Develop a Memorandum of Understanding with the bighorn sheep focused groups and other conservation groups on bighorn sheep management on public lands within each region affected by solar energy development.
4. Ensure that bighorn sheep hunting or access to bighorn sheep hunting are not closed or restricted due to solar energy development on public lands.
5. Use habitat enhancements or other accepted techniques to prevent bighorn sheep from utilizing habitats close to SEZ and other high visibility areas that might put them at risk.

Access

The ability to access and use public lands is imperative to multiple-use management and public trust stewardship. Solar Energy Zones will convert many acres of public lands to single use and

that will result in loss of access and use of those lands within, and possibly adjacent to, authorized SEZ.

Recommendations

1. Ensure that overall access to public lands will not be affected other than those lands that are essential for solar energy production.
2. Require all losses of access to be offset by the acquisition of private lands, access easements to private lands, or access to currently inaccessible isolated public lands.
3. No shooting zones or other restrictions to hunting and shooting need to be identified in the Final PEIS and those acres adequately mitigated.
4. Public use of roads, trails, and other rights-of-way for access to public lands should not be impacted, unless compensation is provided.
5. No region or state should have so much solar energy development that the public would be dissuaded from accessing public lands due to industrial solar energy development.

Cumulative Impacts

Solar energy development is just one of the types of use that is authorized on public lands that creates stress on fish and wildlife, watersheds, air quality and public land users. The secondary infrastructure required for transmission lines for solar power can have a much larger impact that is often not fully taken into account. In order to understand the magnitude of impacts that solar energy contributes, a comprehensive cumulative impact evaluation is needed. Often NEPA documents have weak cumulative impact analysis requirements and defer this important information to a later time and then it is never completed.

Recommendations

1. The cumulative impact analysis should include impacts from all existing and future energy development (oil/gas, coal-bed methane, wind, geothermal) and mineral extraction (coal, uranium, precious metals) as well as development on adjacent or nearby non-federal lands.
2. Cumulative impacts should be tied to the mitigation planning to effectively alleviate impacts to fish and wildlife resources, access, and recreation.
3. An “energy road map” for each state should be developed by BLM to identify what type of energy and how much of each type will be produced for the near (10 year) term.
4. Solar energy zones or variance applications should not proceed in areas where cumulative impacts would result in unacceptable impacts or irretrievable losses to fish, wildlife, and outdoor recreation.
5. No loss of hunting or fishing opportunities should result from cumulative impacts associated with solar energy development on public lands.

Compensation

The designation and authorization of solar energy development on public lands is a new paradigm in energy development for public land management. SEZ will become single use areas and could be interpreted as a change in the multiple-use management (this is also true for intensive industrial authorizations of other forms of energy development like oil, gas, and wind). In order to adequately offset the conversion of public lands to a single use, compensation mitigation must be applied as lands are designated for solar energy development.

Recommendations

1. Compensatory mitigation actions should be incorporated in Regional Mitigation Plans and include actions for losses to fish and wildlife habitats, access, and outdoor recreation.
2. Compensatory mitigation ratios should be established to identify how much compensation is required for each resource and value that is converted to single use.
3. Lands within each region should be designated as "compensatory reserves" where energy development (all types) would not take place to off-et the designation of SEZ. These reserves should be in areas where fish, wildlife, recreation, and access can be sustained for the life of the SEZ.
4. Voluntary exchanges, easements, or other actions from industry to compensate for the designation of SEZ should be included in the Final PEIS.
5. Funding mechanisms, either appropriated or voluntary, should be included in the mitigation trust fund and established in the Final PEIS.

Additional Recommendations

1. Continue to move forward with the SPEIS and complete a final document in 2012.
2. Establish a process for competitive leasing for solar energy on public lands within or outside of SEZ to generate a fair return for the use of public lands. Integrate successful local, state, or regional planning into the Final PEIS and ROD. We strongly support the process where all future solar energy development proposals are executed with a competitive lease process. Currently the BLM is seeking comments on developing regulations for competitive leasing of solar and wind energy on public lands. We applaud and support this effort. We believe such a process will provide a more enhanced development review structure and public review process for guiding location and implementation of solar and wind projects on our nation's public lands.
3. Evaluate the potential socio-economic loss of hunting, fishing, and other recreation on public lands from the development of solar energy and the designation of SEZ and mitigate it.

4. Improve the analysis of how surface and groundwater is going to be impacted and provide more details on how water allocation and use will be secured and conserved by solar energy proponents.
5. Continue to seek additional funding for mitigation and compensation for impacts to fish, wildlife, access and recreation.

State Specific Comments/Recommendations

California

1. Remove the Iron Mountain Solar Energy Zone from further consideration or defer it until it is addressed in the Desert Renewable Energy Conservation Plan (DCREP) process.
2. Subject all proposals outside of SEZ including in the variance areas to the DCREP process before moving forward with solar projects.
3. Identify potential private lands that could be used to increase the amount of acreage that SEZ could entail to protect sensitive fish and wildlife habitats.
4. Coordinate all SEZ and Variance processes with on-going and soon-to-be-completed BLM Resource Management Plan amendments.
5. Incorporate the final DCREP plans into future solar energy development on public lands through appropriate NEPA and RMP amendments.

Nevada

1. Suspend the variance process until the existing 24 applications have been put through the SEZ screening and process for potential designation.
2. Carry forward the proposal to remove the west flank of the old Dry Lake North SEZ as it was in a mule deer migration corridor and the East Mormon Mountain SEZ due to the potential for cutting off already limited access to the Mormon Range

In conclusion, we are pleased with the progress the BLM has made and its commitment to addressing concerns that the SFRED coalition and our individual organizations have raised in the Draft PEIS. Our coalition supports responsible energy development on public lands and applaud the BLM for moving solar energy development in this direction. We look forward to continuing to work with the BLM on the development of the Solar PEIS and offer our assistance in those areas where we have specific policy or management expertise such as mitigation of fish, wildlife and recreational impacts from energy development

Sincerely,

Kate Zimmerman
Senior Policy Advisor
Public Lands Program
National Wildlife Federation

Steve Belinda
Senior Policy Advisor, Energy
Theodore Roosevelt
Conservation Partnership

Brad Powell
Energy Director, Sportsmen
Conservation Project
Trout Unlimited

SPORTSMEN FOR
Responsible Energy Development

Arizona Wildlife Federation
Backcountry Hunters and Anglers
Bull Moose Sportsmen's Alliance
Colorado Wildlife Federation
Desert Bighorn Sheep Council
Fraternity of the Desert Bighorn
New Mexico Wildlife Federation
Quail & Upland Wildlife Federation
Quail & Upland Wildlife Federation – Santa Clarita Valley Chapter
The Wildlife Society
World Wildlife Fund – Freedom to Roam Initiative

Thank you for your comment, Mike Trujillo.

The comment tracking number that has been assigned to your comment is SEDDsupp20182.

Comment Date: January 27, 2012 21:24:49PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20182

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Attachment: Mike Trujilo PEIS Comment.docx

Comment Submitted:

January 27, 2012

Attn: Linda Resseguie

Argonne National Laboratory

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Argonne, IL 60439

RE: Public Comment for the Supplement to the Draft Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States

To Whom It May Concern:

Consider this as a formal statement of concerns as the Mayor of the Town of Antonito. The Town of Antonito is approximately one mile north of the proposed Antonito Southeast Solar Energy Zone (SEZ) in the state of Colorado. Thank you to the Bureau of Land Management (BLM) and Department of Energy (DOE) for the opportunity to comment on the Draft PEIS (supplement).

I have attended two meetings, in Alamosa, CO, with regards to the proposed PEIS and have the understanding that large-scale projects can provide jobs, economic growth and energy efficiency. Alamosa County is currently engaged in large-scale solar projects. The majority of the comments at the public meetings I attended were not in support of this federal driven campaign. Many concerns were recorded and heard and I appreciate it. I believe that most of my issues were addressed by others at these meeting, but will take this opportunity to address my other concerns.

Town of Antonito's Interest in a Portion of Antonito Southeast Site:

I have been the Mayor of Antonito for six years and have been a member of the Town of Antonito Board of Trustees (TOA) for eight years. During this time period, the TOA has been a supporter of renewable energy. The TOA was interested in leasing land from the BLM to develop an industrial park and partnered with the San Luis and Rio Grande Railroad (SL&RG) for this development. The project took on many different titles, which was finally termed "Intermodal Exchange". The initial application requested approximately 1/8 of the current Antonito Southeast Site, which encompassed a portion of Highway 285 and a square piece of land owned by the state; which is the west end of the Antonito Southeast SEZ. At the time it was not known to be Antonito Southeast Site. The TOA 's half was to be devoted to developing renewable energy plants, a mechanical plant, a truck stop, service stations, etc.; whereas SL&RG would use their half for storage of train cars, service centers for train cars and loading docks.

BLM determined a right of way would be more consistent with their policy. The TOA then sought to acquire the state land reserved for schools (Section 18 and Section 36) for the industrial park and wrote a letter supporting SL&RG's right of way. The use of the state land, the missing square on the Antonito Southeast Site, was never clearly defined but that it would be used in an industrial setting. There were

also discussions by SL&RG to use a portion of the land for soil storage. This led to some disagreements and caused SL&RG to purchase private land near the river to develop their own "Intermodal Exchange". This caused a legal battle between local governments that partnered with a nonprofit organization and SL&RG that partnered with Department of Energy (DOE), Energy Solutions; a low-level radioactive waste dump operator and hazardous soil removing company out of Utah and Los Alamos. The result: SL&RG is currently not using their property to transfer soil from Los Alamos.

Because there was no clear direction on how to acquire BLM land, neither SL&RG nor TOA benefited from their efforts. I believe that a portion of the Antonito Southeast Site should be left out of the study being that local efforts had a vested interest and that the use would be diverse. I believe that BLM needs to visit with elected officials and become aware of the efforts of the local municipalities and be cognizant of the needs of municipalities, and local companies as well as multi-national corporations.

The land belongs to the people and have entrusted their representatives to get the best benefits from this parcel, which could include revenue sharing, restoration and regulation.

Infrastructure:

Conejos County is one of the poorest counties in the United States and does not possess the amenities required to accommodate a project this size (greater than 20 MW). The promise of jobs and energy conservation has my full support; however it needs to reflect the need. A power plant that is constructed to sustain a community and limit the amount of coal, nuclear and natural gas is beneficial and a wonderful concept. The proposed PEIS is targeting a county that is primarily on septic systems and well water. The exceptions are those that are hooked up to the Town of Antonito Water and Sewer system (close proximity to the town). This system is out dated and will need to be upgraded in the near future. The town would not be able to provide water to a facility far from town and water rights are not easy to acquire for augmentation. The size of the project will also require a large influx of temporary employees and they may want to build homes and hook up to a water supply. These temporary workers will run into the same problem as highlighted during public meeting by Alamosa County officials.

The TOA also has issues with its drainage system. The downtown Highway 285 is currently undergoing damage as a result of five drainages that need to be replaced. The Colorado Department of Transportation (CDOT) is willing to pave the highway provided that the TOA replaces these drainages that are underneath Highway 285. The project would cost the TOA one million dollars and is an expense that is not affordable. I assume that with a project this size that our highway will not be able to withstand the increase in traffic, it is not handling the existing load now and is a hazard. Antonito experiences heavy rainfall July through August and the result is a flooded downtown area.

Mitigation:

Poor drainage is another problem the TOA faces. There are no accommodations for large quantities of people. Natural disasters would yield chaos if people were forced to stay in the local area. We are currently working on this mitigation plan but nothing is in place. Our neighbor to the north, Alamosa, would have to take the brunt of the load. The seasonal natural disasters we experience here are forest fires, blizzards and heavy rainfall in the late summer.

Schooling:

I am a math/music teacher at Antonito High School and our district has hired architects to develop a new school. Colorado Department of Education (CDE) will help us build the school through a grant program and we would need matching funds. Conejos would have to acquire a bond or increase the mill levy. They will look at our enrollment from the past two years and use this figure to project that size of school and the funding that we will need. The time of completion should be two years and we would need estimates or a study done on the potential enrollment increases from a project this size, so that we could give that data to CDE. High projections could be a burden to the tax payer in an already impoverished community. The county would need to be compensated for this increase.

Economic Development:

A portion of our community would have a direct impact with regards to employment and a segment of Antonito residents currently work for the solar developments in Alamosa County. The employment is not consistent and the complaint from many of them is that they start off with high wages and are progressively phased out.

The TOA is currently working on developing a Community Solar Garden, under the Solar Gardens Act of 2010 in the State of Colorado, on its own private property that could be a gateway to many other developments around the community. The goal is self-sustainability and establishing another enterprise. The TOA currently provides its citizens with water and waste water. The current water and waste water enterprise provides 2.5 permanent employees with temporary employment between 2-20 positions. The current solar garden project will be 500MW with the potential to become 2MW. This could mean two full time positions being funded by the savings from hosting the Community Solar Garden.

The TOA recently acquired two grants for the restoration of its historic Denver Rio Grande Depot. The grants are from CDOT and National Historic Society. The project will yield jobs; however, due to the bonding requirements and state regulations none of our local contractors will have a chance. I believe that the large scale utility would have the same conclusion.

I am in support of renewable energy; however, I believe through the use of distributed generation and building in phases will provide a more sustainable outcome for small municipalities. To support large-scale solar projects, a community would need a large-scale infrastructure to support those projects. The TOA does not have that infrastructure. I believe the TOA can benefit through shared lease agreements with multi-national corporations, revenue sharing, detailed mitigation plans and multi-national corporations developing accommodations within the town boundary to support a large volume of people. Thank you for the opportunity to comment on the Draft (PEIS).

Sincerely,

Mike Trujillo, Mayor

Town of Antonito

Antonito, CO 8110

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Thank you for your comment, Stu Webster.

The comment tracking number that has been assigned to your comment is SEDDsupp20183.

Comment Date: January 27, 2012 22:56:19PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20183

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Attachment: Iberdrola_SDPEIS_Comment-FINAL-27Dec12.pdf

Comment Submitted:

IBERDROLA RENEWABLES

January 27, 2012

Solar Energy PEIS
Argonne National Laboratory
9700 South Cass Avenue-EVS/240
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RE: 1610 (300): Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

To Whom It May Concern:

Iberdrola Renewables, Inc. (IRI) is an independent power provider. We own and operate approximately 5,000 megawatts of wind and solar energy projects nationwide, and are actively developing wind and solar projects of various technologies across the U.S. We have been working in partnership with BLM for eight (8) years on wind and solar projects across four (4) western states. Currently we have two (2) assets now operating on lands administered by the Bureau of Land Management (BLM), and close to 20 additional wind and solar projects in various stages of development.

We thank you and your staff for your committed efforts in producing and releasing the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development (SDPEIS), and for your dedication to seeking long-term solutions that will support the solar industry. We wish to stress that our commitment to this process is to realize the areas of common agreement with other industry stakeholders as well as non-industry stakeholders. To such an end, we start by stating our general support of the industry's combined efforts as submitted by Peter H. Weiner, Partner of Paul, Hastings, Janofsky & Walker LLP, on behalf of the Center for Energy Efficiency and Renewable Technologies (CEERT), Large-Scale Solar Association (LSA), and Solar Energy Industries Association (SEIA). Additionally, we recognize the challenges that BLM faces with meeting the needs and expectations of multiple land interests. We therefore also support the comments and suggestions made in the Joint Comment Letter (as submitted by representative signatories from the solar industry and environmental organizations, IRI included). Finally, we are aware that The Nature Conservancy (TNC) is developing a proposed path forward for development of a mitigation program. While we are not fully aware of the specific elements we do generally concur with the TNC that such a program is needed sooner than later in order to fully maximize the potential of the solar PEIS. With said support, we feel it important to expand on some of the stated positions as well as bring forward key issues which we believe need additional focus:

1. We ask that the BLM explicitly confirm that applications and project commitments underway prior to issuance of a Final PEIS be evaluated under *existing* BLM policies. To this end, the reference that pending applications in proposed exclusion areas may be denied (Page 1-11) should be removed and confirmed as not applicable. The importance of this is the level of investment made to date on BLM land that may very well enable solar energy development while avoiding, minimizing, and/or mitigating impacts to a sufficient degree. Additionally, to act contrary to this recommendation leaves a significant

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number of pending applications and project commitments with no incentive to be moved forward by BLM staff, opting to instead to wait for this PEIS process conclude, the timing of which is suspect given the public review and potential challenge of so ambitious an effort.

2. The current Solar Energy Zones (SEZs) proposed in the SDPEIS are insufficient, both in size, number and location. While we recognize that the SEZ concept is deemed by the BLM a preferred element of the SDPEIS for reaching common ground with all stakeholders, IRI is seeking assurances beyond what little is documented in the SDPEIS on how the variance process will be practically implemented and managed. Undoubtedly, due to the lack of environmental assessment of the SEZs selected by the BLM to date, there will be a need to accommodate solar energy development in non-SEZ areas in order to meet the expectations of meaningful total build out of renewable energy on federal lands. The possibility of such an outcome is clearly contemplated by BLM under Table 2.2-1 *Revised Areas for Exclusion under the BLM's Modified Solar Energy Development Program Alternative*, criteria #26 which states that areas within a SEZ may be deemed inappropriate through a NEPA process. As detailed in the industry letter, we encourage the BLM to commit to designating additional zones in the near future, and by a specific date, to respond to industry and Renewable Portfolio Standards (RPS) needs.

3. Given the lack of environmental screening, transmission constraints, and physical limitations, the current proposed SEZs do not provide clear development advantages over variance areas, naturally leading to an unsubstantiated prejudice towards proposed projects in non-SEZ areas. Rather than address the inadequacy or lack of criteria that dictates what is an appropriate area for development, the SDPEIS addresses the acknowledged inadequacy of SEZ by creating a variance process for non-SEZ consideration as well as commitment for additional or expanded SEZs in the future. Both of these options still require a substantive set of criteria to establish the appropriateness of development, which the SDEIS fails to address. To that end, we strongly encourage the BLM to include with this PEIS process an adaptive management commitment whereby the BLM evaluates the difference of applications within and without SEZs. Such an analysis, combined with stakeholder input, should lend well to making an informed decision on how to proceed with broadening the effectiveness of managing BLM land for solar energy development.

4. In the interim, the variance process, as currently proposed, must provide adequate flexibility for developers, particularly as zones are insufficient or infeasible. We support the industry position that variance applications should be permitted in areas with low or comparatively low resource conflicts. Further, we maintain that BLM's proposal to impose additional screening requirements for applications in variance areas (e.g., additional public meetings and earlier cultural resource surveys) are burdensome, superfluous and unnecessary in light of basic NEPA requirements that already apply for such projects. The NEPA process was developed to publicly and fully vet consideration of federal actions. NEPA was not contemplated to be a secondary effort of publically vetting an action already deemed appropriate by a public agency.

5. With respect to the immaterial nature of the method used to select SEZs for solar development, IRI strongly recommends that BLM not attempt to predict the logistical feasibility of solar development. In order to optimize project development, the BLM should be more lenient on the treatment of slopes and solar resource areas. Additionally, BLM should not assume that transmission infrastructure dictates energy development interests. If no capacity exists on a given transmission line then it is effectively as meaningless as if the line did not exist. We concur with the industry letter comment that the analysis conducted by BLM on line capacity falls well short of accurately portraying the conditions of those lines, a process which, for a single line, costs hundreds of thousands of dollars to conduct.

6. Exclusions based on slope or solar insolation are technology considerations that should not be mixed with environmental considerations. Areas currently defined with a direct normal insolation (DNI) below 6.5 kWh/m2/day should not be considered exclusion areas based on these characteristics alone. Dozens of economically successful solar plants in North America and Europe operate with solar resources well below this value. As the solar industry advances, technological innovations will

continue to reduce the insolation threshold necessary for a feasible project. A decision to exclude lower insolation areas will make BLM policies discrepant with best industry practices.

Additionally, areas currently defined with slopes above 5 percent should not be considered exclusion areas based on their terrain alone. As technology innovations continue, these areas may provide sensible and advantageous locations for new solar development. Current NEPA screening requirements are sufficient to identify and protect any sensitive habitat areas that may be located in steeper terrain.

7. We do not support BLM's proposal for a 10-foot height and PV-only limitations on more than 25 percent of the SEZ areas. The 10-foot limitation is an arbitrarily-defined threshold that may unnecessarily restrict the successful application of some technologies. Project heights, as with other project design features, should be evaluated and mitigated, when necessary, on a case-by-case basis.

8. Finally, as noted in the industry letter, exclusion areas, as currently proposed, are unnecessarily restrictive and vaguely or subjectively defined. As one of several examples detailed in the industry letter, IRI is adamantly opposed to item 29; "Individual additional areas identified by BLM State or field offices as requiring exclusion due to ecological or cultural concerns." This limitless uncertainty of future exclusion zones will have a detrimental effect on streamlining the application and permitting processes. Exclusion areas should not require additional interpretation from the field offices subsequent to the publication of the Final PEIS.

In addition to the shared industry positions points above, we offer the following points from our own perspective working with BLM on numerous wind and solar projects across the West and Southwest.

9. We support measures to distinguish between substantive applications and applications that will not result in actual solar energy projects (a.k.a., land squatters). We further support BLM's proposal to include this as a variance screening criterion. However, we encourage the BLM to utilize the PEIS process to clarify the intent of previously adopted Instruction Memorandums (IMs) (specifically 2011-059, 2011-060, and 2011-061). Experience has been that practical application of the IMs results in inconsistent and unreasonable expectations, particularly driving environmental review effort for the sake of administrative progress rather than in logical steps of environmental review that reflect the realities and constraints of project development. This is not a trivial issue as the margin of competitiveness with conventional fuel energy generation is narrower than ever before. BLM's mandate for supporting renewable energy necessitates that mindful development must be balanced with cost efficiencies of development and of the application process. We suggest the following steps be developed in the SDPEIS:
    a. Training seminars to bring consistency among BLM office staff on how to appropriately meet the intent of the financial and environmental due diligence IMs.
    b. Create a platform whereby BLM responds to public comments and recommendations on how to clarify the intent of the IMs, given they were drafted with no input from affected parties.

    c. Greater emphasis on IM 2011-060, *Solar and Wind Energy Applications – Due Diligence* on…as the primary filter for viable project applications . The financial stability of the applicant should be fully vetted before the National Environmental Policy Act (NEPA) process is unduly instigated for no other reason than to compel a developer to act or abandon a Right-of-Way (ROW) grant process.

10. Solar thermal technologies. As noted above in Comment 8, we are concerned about undue restrictions on solar thermal technologies (including wet cooled systems), which will play an important part in helping states meet their RPS goals. Energy customers (utilities) are seeking competitively priced products, but also delivery on demand. Concentrated solar projects offer a useful and increasingly desirable source of dispatchable power, particularly when they include added storage. While we support all solar technologies, we believe there is a strong likelihood that customers will increasingly seek dispatchable sources of power to balance out load fluctuations introduced by other

intermittent resources as well as the impending retirement of highly polluting coal plants. We therefore urge BLM to provide flexibility in allowing solar thermal projects of all technologies and cooling systems as long as they appropriately address water use impacts. We believe it is extremely important for BLM to not pick technology winners and losers, but instead follow their mandate to create a transparent, clear and robust policy environment that facilitates timely deployment of renewable energy on federal lands.

11. ROW grant timing. The SDPEIS does not provide a clear method for preserving an issued ROW grant beyond a limited period of time. If such a concession is in place with current policy, it is not well understood nor does it provide a sufficient level of assurance to compel an applicant to risk pursuing a ROW grant that lacks a clear market for and delivery of solar energy. Rather, the SDPEIS suggests a continuation of using the NEPA process as a means of forcing applicants to move forward with developing projects that may not be economically viable. This is effectively a cart before the horse scenario – evaluating the environmental benefits and impacts of a project that is not capable of responding to market demand.. This issue is reflected in point 2 above with respect to current policy, as detailed in BLM IM 2011-059.

In short, we do not advocate the SEZ-only alternative and greatly appreciate the BLM's recognition of the impracticality of the SEZ-only alternative by creating a variance option. The zone-only proposal, due to its limitations in size and location, does not respond to the short-term realities of national renewable energy policies. Finally, IRI fully supports and embraces the concept of responsible energy development. However, much like sustainable development, it remains merely a concept without definition. BLM should work towards developing a transparent, consistent, repeatable criteria by which all proposed energy development on public land is evaluated equally; benefits as well as impacts. This would establish a definition to responsible development, moving beyond a subjective concept, prone to being reduced to merely a source of endless debate.

We look forward to continuing to work with the BLM to find mutually acceptable and effective methods of promoting solar development on BLM-administered land. Feel free to contact me at your convenience at (503) 796-6951 to discuss these comments if further information or clarification would be helpful.

Best Regards,

Stu S. Webster
Iberdrola Renewables, Inc.
Director, Permitting and Environmental Affairs 1125 NW Couch St., Suite 700
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Thank you for your comment, Michael Garabedian.

The comment tracking number that has been assigned to your comment is SEDDsupp20184.

Comment Date: January 28, 2012 00:33:06AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20184

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Attachment: SDPEIS comment-tc-Jan 27'12Final.doc

Comment Submitted:

Committee on 245 Million Acres
BLM Solar = Unsound on the Ground
7143 Gardenvine Avenue
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January 27, 2012

Electronic Submission

Director Bob Abbey, Bureau of Land Management
Secretary Steven Chu, Department of Energy
Argonne National Laboratory
9700 S. Cass Avenue - EVS/240
Argonne, Illinois 60439

Re: The Solar Energy Development in Six Western States project Supplemental DPEIS and the need for public hearings throughout The West after release of sufficient NEPA documentation

Dear Secretary Chu and Director Abbey:

John Muir in 1905, upon arriving near Mount Graham in southeastern Arizona from Palm Springs, wrote, "I never breathed air more distinctly, palpably good, It is clean, fresh, and pure as the icy Arctic air." Donald Worster, A Passion for Nature: The Life of John Muir (2008), page 392.

Mary Austin too wrote about the pristine desert air, "For one thing, there is the divinest, cleanest air to be breathed anywhere in God's world." Mary Austin, The Land of Little Rain (1903), in, Words for the Wild: The Sierra Club Trailside Reader, Ann Ronald Ed. (1987), page 151.

Austin was writing in the Owens Valley, California, which today is measured to be among the most toxic air basins of the world. Today with desert solar, another desert environmental reversal is upon us.

In 1879 referring to the abandoned mining towns of Nevada, John Muir wrote, "They are monuments of fraud and ignorance—sins against science." But he went on in a more positive vein,

> The fever period is fortunately passing away. The prospector is no longer the raving, wandering ghoul of ten years ago, rushing in random lawlessness among the hills, hungry and footsore; but cool and skillful, well

> supplied with every necessary, and clad in his right mind. Capitalists, too, and the public in general, have become wiser, and do not take fires so readily from mining sparks; while at the same time a vast amount of real work is being done, and the ration between growth and decay is constantly becoming better.

John Muir, Nevada's Dead Towns, in, The Sierra Club Desert Reader, Gregory McNamee, Ed. (1995), page 18.

I visited Ivanpah Valley to see it and the solar plant construction destruction there eleven days ago for the second time in four weeks. Contrary to Muir's pre Hetch Hetchy dam optimism, Ivanpah and other areas in the six states are faced with a new fever, the solar energy fever that is sweeping the deserts of the southwest. This is a land rush for which BLM and DOE and their "cool and skillful" stakeholders are positioning themselves as the facilitating agents. Law and science are being put aside in a modern, unprecedented retreat from wisdom and into the ignorance Muir described.

Muir's 1879 vision that modern times were better for the desert may have found a more recent adherent whose writing defines the current and proposed actions of BLM, DOE, the six states, their apologist stakeholders who are giving cover to government desert-based welfare and public land giveaways, and the corporate solar profiteers[1] and beneficiaries of solar largesse. The definitions of Joseph Wood Krutch are apt for describing the scandal of solar public land misuse as a radical conquest of the desert by those who are incapable of listening to it.

> To those who do listen, the desert speaks with an emphasis quite different from that of the shore, the mountains, the valleys or the plains. Whereas they invite action and suggest limitless opportunity, exhaustless resources, the limitations and mood of the desert are something different. For one thing, the desert is conservative, not radical. It is more likely to provoke awe than to invite conquest. It does not, like the plains say, "Only turn the sod and unaccountable riches will spring up." The heroism which it encourages is the heroism of endurance, not that of conquest.

Jopseph Wood Krutch, The Voice of the Desert (1955), in, Words for the Wild: The Sierra Club Trailside Reader, Ann Ronald Ed. (1987), page 187.

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[1] "A Gold Rush of Subsidies in Clean Energy Search," NY Times, 11/11/11, http://www.nytimes.com/2011/11/12/business/energy-environment/a-cornucopia-of-help-for-renewable-energy.html?_r=1&ref=business

And, what is at stake here? It is the delicate and still significantly unknown biology of the desert and its roles in the ecosystem as the largest remaining mainly undisturbed American landscape outside of Alaska.

These lands are under immediate threat of long-term ecological destruction by massive scale centralized solar development. These deserts – The basin and range of The Great Basin from which I like to separate out a widened and geologically distinct Colorado Plateau, The Sonoran, The Mojave, and the Chihuahuan -- are the Alaska of the continental states. That is, a wild backyard for us and its plant and animals.

> The deserts represent one of the last North American areas in which large tracts of land remain relatively uninhabited. The arid wilderness has been slower to "develop" in the usual sense than areas more amenable to settlement and exploitation through agriculture and industry—a magnificent beneficence insofar as desert and wilderness aficionados are concerned. Space between people is one of the desert's most pleasing aspects for those who would explore it. …
>
> When Environmental stresses build, animals and man can crawl, walk, run, or fly to reach the most amenable environmental conditions available; not so the rooted, immobile plants which must meet sun, wind, heat, and aridity where they stand. In the desert where moisture supplies tend to be limited and environmental stresses tend to be extreme, the plants, in order to survive, must be capable of operating with a low margin of error where high demand and low supply of water is concerned. Ranging from cacti to creosote bush to boojum tree, those plants that have been successful in meeting this challenge make up one of the most highly adapted, unusual, and interesting of the world's faunas. …
>
> The so-called desert world is actually a mosaic of smaller worlds, and the environmental conditions present in any one of these small worlds are often strikingly different from those of another area which may be located only a few feet or even inches away. These smaller pieces of habitat, or <u>microhabitats</u>, in general each have their own microclimate

Peggy Larson with Lane Larson, Drawings by Lynn Larson, Foreward by Edward Abbey, A Sierra Club Naturalist's Guide to The Deserts of the Southwest (1977) pages 14, 49 and 50.

Failure to recognize, identify and describe the great diversity of Mojave Desert plant communities and the assessment needs and mechanisms to carry out this area and species identification and assessment the great diversity of Mojave Desert plant communities.

I (Michael) am a native Californian, and in the Summer of 1964 I first looked, not having seen it before, at the basin and range disappearing into the distance from Fandango Pass in the Warner Mountains of California. My exploration of it started then, continued in earnest beginning 15 years later when I went to the valleys proposed for MX missile race tracks, and continues to this day.

My travel to the Colorado Plateau began in 1979 in southeast Utah, and then grew exponentially and has continued in the slickrock/Canyonlands desert from 1989 to the present, though I entered my first of so many slot canyons only in 1997 in Grand Staircase Escalante, NM.

I've also traveled for many years in the high deserts of Oregon and other states, and in more recent years to Big Bend NP, Saugauro NM, Organ Pipe NM.

Regarding the Mojave, in the winter of 1964 I first visited Death Valley—my introduction to it. I've been to Death Valley many times, heavily from 1979 to 1981 including every way I could find in and out of it, and regularly since returning to California in 1997. As for the rest of the Mojave, other than a north-south trip through the heart of it in the 1960's, I've traveled through it many times without stopping until I reached my destination.

So, none of these desert wanderings prepared me for the five days I've spent in the last five weeks seriously exploring the Mojave Desert outside of Death Valley for the first time. As we or I went to different landforms and places, I began to notice different dominant shrub species, and this more than the landforms we were seeking on the first trip began to dominate my curiosity. Before that I could never have imagined encountering the amazing variety of shrub species that are found in the Mojave from one place to the next, not to mention the interspersed cacti. I got my B.S. in Forestry and Conservation field work that was mostly in the Sierra Nevada, and this familiarized me with paying attention to the shrub layer and the limited number of dominant shrub species that are there compared to what can be seen moving around the Mojave. When I returned to the Mojave for my second recent trip, this is what I looked for, even retracing my steps. I'd come to have little expectation of more than seeing one or two dominant species like sage or pinyon juniper that dominate so many other plant communities of the west.

And now I look for and do not find in the SPEIS documents meaningful recognition of, information about, assessment mechanisms for, or explanation of, how the plant community diversity I experienced in the shrub layer or other plant community diversity will be handled and protected for this project. Does the failure of the PEIS documents to give major recognition to this stunning biological fact of the Mojave and to alert the decision makers and public to it mean that the PEIS is inadequate to the task at hand? In a word, yes. It is reasonable to conclude that the virtual uncountable number of species found in some places and the variability from one place to the next –- a dozen, a couple of dozen, or more species -- are not on the BLM-DOE radar.

It is this experience that led me to the books quoted at the beginning of this letter.

Failure to identify, inventory, map and describe and address the country's last remaining largely undisturbed desert ecosystems including their value, and to provide a NEPA assessment of project impacts on them and how this can be prevented or mitigated.

The DPEIS failure to address the rich shrub and other vegetation diversity of the Mojave leads to and is connected to the larger failure of the documents to address the existence of and impacts on the larger desert ecosystems.

The supplement goes in the wrong direction by seeming to narrow its geographic scope without providing for identification and assessment of the ecosystem-wide deserts and the impacts of the project and project options on them.

Any narrowing only points to the fact that both a more "limited" project and the no project alternative may have significant and wide-ranging negative impacts on the desert ecosystems and on the benefits to the environment that the deserts now provide.

But it is basically the same point to say that providing for the opening up of new post-PEIS SEZ areas also is also an unaddressed impact on the larger desert ecosystems.

Failures regarding national, state, district and local and other offices to describe current BLM and DOE staffing including issue, administrative and other assignments, and geographic assignment locations; failure to identify the level of BLM, DOE and other staffing and funding necessary to implement the project, and to failure assess the adequacy of known staffing and funding for achieving the purposes of the project including enforcement.

Missing is identification of the BLM and DOE staffing and the funding that is necessary to carry out the six state project.

Missing is identification of the present BLM and DOE staffing at the local through national levels.

Missing is a comparative touchstone regarding the level of staffing that is necessary to adequately administer BLM lands including the project. One essential comparison is to US National Forest staffing levels from National Forest Districts to regional and national USFS headquarters as a comparative mechanism to determine the adequacy of BLM staffing and ability of BLM to carry out the project in the necessary manner.

We note that National Forest staffing now appears to us to outstrip BLM staffing at every level, and BLM does not even have the necessary level of staffing to prepare this DPEIS or to oversee contractors working for BLM.

The present situation of governmental financial incentives to solar developers without the parallel of BLM staffing resources makes it essential for BLM and DOE to identify the staffing needs it has for this project. Without necessary BLM and DOE staff, Congressional financial incentives to solar developers become a factor adding to the giveaway of public lands contemplated in the SPEIS.

Large scale solar facilities and this project pose the biggest threats to our public lands and to our country's ecology in history. We oppose both.

The massive failures of the PEIS documents and the absence of public involvement regulations are additional independent reasons for our opposition positions. The NEPA documents and the public process are failures. We do not have sufficient information to make any other recommendation. BLM and DOE do not have sufficient information and public involvement to make a decision.

Once sufficient NEPA documentation is released, and after public involvement regulations have been adopted, there must be hearings throughout the West on the project and on the future of our country's ecological integrity that is threatened by big desert solar.

Sincerely,

QuickTime™ and a
decompressor
are needed to see this picture.

Michael N. Garabedian, Co-founder
916-727-1727

Thank you for your comment, Loretta Mitson.

The comment tracking number that has been assigned to your comment is SEDDsupp20160.

Comment Date: January 27, 2012 18:52:54PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20160

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Attachment: SOLAR PEIS.doc

Comment Submitted:

Given the State of the Union address by President Obama this past week, it seems moot to offer any public input contesting the wisdom of opening public lands to large scale solar development. It seems that his mind is made up and the tens and tens of thousands of comments from the public will go unheeded.

However, I have some concerns to address that, no doubt, others have already pointed out. Maybe if our concerns are voiced by enough concerned people someone will realize the huge error that the federal government is making.

FIRST, I would agree that public lands under the administration of the federal government NEED to be managed for multiple use. Certainly oil, natural gas, and coal are necessary for the survival of our country and certainly they do not exist everywhere, so when they are discovered on federal land and are economically and environmentally feasible to mine, then the government has to make some hard choices to make that resource available for the public good.

Solar, however, is an entirely different resource and so it needs to be addressed differently. Obviously the sun shines everywhere, not just on publicly managed lands. The federal government is making a huge mistake in making public lands available for solar development because there are already ample sites on private property for this kind of development.

In my home area of the San Luis Valley of southern Colorado there exist about 400 agricultural center irrigation pivots about to be decommissioned due to the state mandate to shut them down, in order to preserve the aquifer. This is scheduled to begin in the next year. Most of these 400 parcels of land have about 160 acres which are already connected to the existing electrical grid. So that translates to 64,000 previously productive acres not generating any revenue for their owners, for their counties, or for this state. What an opportunity to make that land available for solar development. How sad that the federal government plans to make OUR public lands available for solar development, in DIRECT COMPETION with private property which would be a much better choice for solar collector siting.

SECOND, if the federal government is so interested in creating jobs, the creation of large scale industrial solar development on remote public lands does nothing long term to create meaningful numbers of “green jobs” in

these areas. Industrial scale solar brings in trained developers from other areas to get them built, and then they leave. If this administration wants to create employment in every corner of the southwest, them medium scale solar gardens and individual and small business solar installations need to be encouraged. Imagine a sort of modern day "WPA" to encourage the growth of solar. Solar training programs could be created in every region to train young people to become community installers and resource people to maximize the employment opportunities and to maximize the value added by giving communities more autonomy over their energy use. Imagine that… more jobs everywhere and more money returned to communities all across the country in terms of their ability to meet their own energy demands. What a saving for individual households all over the country.

The current plan by the Department of Interior, the Department of Energy, and the Administration, while sincere in its intent of trying to make this country more energy independent is seriously FLAWED. What is happening is the creation of another opportunity for the existing power industries to create wealth for their investors at the expense of the consumers. Once again the "1%" is offered an opportunity to continue to exploit the rest of us, the "99%". Here is an opportunity for the Obama Administration to make some serious change in the paradigm and really be visionary. It is time to create an opportunity to give the "power to the people".

THIRD, our agricultural area is enduring an ongoing drought. Has anyone done any studies on micro climate change resulting from large areas of open land being covered with solar collectors? This is one of the most productive agricultural areas in the state of Colorado, but it is in a precarious environmental position. Anything that would exacerbate the drought could negatively impact the agricultural economy, as well as the vast regions of wildlife habitat that are already severely stressed.

FOURTH, if energy security is a concern, then solar development in smaller clusters provides us more security from natural or manmade disasters, than does massive concentrations of large scale collectors.

FIFTH, if Ken Salazar and the Department of Interior are so interested in creating a corridor to preserve the heritage and natural resources of the Sangre De Cristo Mountain and Rio Grande corridor, why would they want

to carve up the vistas with unnecessary solar development on public land? These are OUR public lands. The San Luis Valley is our Grand Canyon. The San Luis Valley is one of the last, best, great places in Colorado. It is not necessary to despoil it with industrial development of public land. This policy of Ken Salazar and the Department of Interior is contradictory!

SIXTH, if countries like Germany are anticipating being energy independent by 2020, we should be learning something from their model. Germany has utilized much of their agricultural lands for medium scale solar generation as a way of subsidizing agriculture, thus killing 2 birds with one stone, so to speak.

SEVENTH, we are encouraging a solar model that is almost obsolete before it is even being built. The best siting of small scale solar and industrial scale solar is closer to the point of use. Industrial scale solar so far from the point of use is wasteful of the energy generated and destructive of lands to create transmission corridors.

EIGHTH, if the federal government wants to create industrial scale solar on public lands, then why not consider the corridor along the US/Mexico border. Didn't the INS place a concrete wall along some of that? Certainly it is an area that receives an exceptional amount of solar radiation. Certainly it is an area for which there is no practical use, other than staffing with INS agents trying to catch desperate immigrants. How about that: a solar generation corridor 1,969 miles long, in an area with maximum solar gain, with no other useful purpose?! And while they are out there, the INS agents could keep the collector panels clean! Seriously, though, something to think about.

Thank you for your comment, Olive Toscani.

The comment tracking number that has been assigned to your comment is SEDDsupp20161.

Comment Date: January 27, 2012 18:57:13PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20161

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Attachment: Solar Energy PEIS Letter.docx

Comment Submitted:

Comments attached, thank you

Solar Energy PEIS Scoping Argonne National Laboratory 9700 S. Cass Ave. – EVS/900 Argonne IL 60439

Re: Scoping Comments on the Solar Energy Development Programmatic Environmental Impact Statement

To Whom It May Concern:

I appreciate the opportunity to comment on the Solar Energy Development Programmatic Environmental Impact Statement (PEIS). My sentiments and comments follow:

1. The PEIS must thoroughly analyze potential economic, material, and nonmaterial impacts to desert communities if the greater desert areas are industrialized with solar energy and transmission projects. Many desert communities depend economically on location- and resource-reliant industries such as tourism; location shooting for film, television, and advertising; recreation, both motorized and nonmotorized; and other cultural activities such as art, historical, and spiritual tours and retreats. Loss of greater-desert viewshed and open space means loss of livelihood for desert communities. Desert communities also increasingly rely on the aesthetic and environmental quality of their setting to attract today's increasingly mobile workforce that has become less geographically tethered and can choose where they live. Retirees are also a significant part of our communities that can choose where they live based on natural amenities and appeal. Therefore, our property values depend on those amenities and that appeal. A diminishment in the quality of desert life will mean income directly lost and future potential thrown away for

our communities. Desert towns will lose their meaning, their heart, and their health if the

surrounding desert is essentially "taken away" by industrialization.

2. The PEIS should include a thorough survey of impacts to

potentially culturally and historically significant lands, including areas developed as part of the historic 1938 Small-Tract Homestead Act that shaped many of the outlying, low-density communities in the Morongo Basin and elsewhere in the Southwest deserts. These unique communities in some cases lie largely intact, but their cultural and historical significance is only recently becoming recognized. Refer for example to the 2008 Wonder Valley Homestead Cabin Festival, which generated interest and participation from its cousin homestead-based communities such as Landers and Johnson Valley (http://homesteadcabin.wordpress.com/) and was featured in the 2008 Architectural Annual issue of Dune Magazine.

3. The PEIS should include consultation with Native American tribal governments to determine whether there are sites or specific areas of particular concern, including sites of traditional religious and cultural significance.

4. The PEIS should study the impacts of increased vehicular traffic and congestion on desert communities, environmental resources, road infrastructure, and public safety during both construction and operational phases of solar and transmission development.

5. The PEIS should study the impacts of worker populations on sensitive desert resources during both construction and operational phases of solar and transmission development.

6. The PEIS should study the impacts on resources that would follow from the introduction of new routes, in view of the known problems caused by off-road vehicle activity and the "invitation" effect of new routes.

7. The PEIS should study impacts on limited water resources

and the effects of competition with desert communities, as well as biological communities, for those resources.

8. The PEIS needs to include the proposed expansion of the Marine Corps Air-Ground Combat Center when considering cumulative and long-term impacts.

9. The PEIS needs to consider how the desert communities' own energy needs will or will not be served by these projects.

10. The PEIS must thoroughly analyze the socioeconomic, security, and environmental effects of remote installations versus locally distributed power and consider alternatives that focus renewable energy development close to the load centers. The impacts and benefits of a comprehensive program involving rooftop solar across the developed Southwest, as well as additional potential energy alternatives, must also be thoroughly analyzed and considered. To single out the desert to bear the brunt of providing energy for the urban areas is an ENVIRONMENTAL JUSTICE issue. To demand sacrifice only of the desert areas and not the load areas is not acceptable!

11. Areas that have already been degraded should be prioritized for consideration for solar and transmission development. No public lands that are basically still relatively undisturbed should be considered for solar energy or transmission use until all degraded lands have been utilized.

12. Removed from any consideration for solar and transmission development should be all protected lands, such as national and state parks, monuments, and preserves; environmentally significant areas such as Designated Wildlife Management Areas and Areas of Critical Environmental Concern; and lands with significant environmental

resource potential such as Wilderness Study Areas, other lands with wilderness

characteristics, and areas that are under consideration as potential wildlife corridors.

13. The PEIS must include a programmatic evaluation of cumulative impacts to Endangered and Listed species, especially the Desert Tortoise.

14. The PEIS must study the potential of construction and operational phases to introduce or encourage invasive vegetation, including *Brassica tournefortii* or Saharan Mustard, not just at project locations but throughout the desert areas, as vehicles are one of the biggest culprits for spreading invasives.

Thank you for your attention to these comments,

Sincerely,

Olive Toscani

Thank you for your comment, David Festa.

The comment tracking number that has been assigned to your comment is SEDDsupp20162.

Comment Date: January 27, 2012 19:03:34PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20162

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Attachment: SolarEnergyDevelopment_Letter.pdf

Comment Submitted:

EDF
ENVIRONMENTAL
DEFENSE FUND
Finding the ways that work

January 27, 2012

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NEPA Compliance Officer
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Shannon Stewart
Senior NEPA Program Lead
Bureau of Land Management
1849 C Street NW, Rm. 5665
Washington DC 20240

SUBJECT: Comments on Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

Dear Dr. Summerson and Ms. Stewart:

Thank you very much for the opportunity to comment on the Solar PEIS.
Our comments are limited to those portions of the Draft PEIS and associated supplement that pertain to impacts on wildlife and special status species.

The Draft PEIS does an excellent job of identifying avoidance and minimization measures (referred to as "design features") for wildlife and special status species (Appendix A, page A-55, Section A.2.2.11.1 Siting and Design). We also support the requirement to develop an Ecological Resources Mitigation and Monitoring Plan (Appendix A, page A-62, line 24) that will include "Compensatory mitigation and monitoring to address any significant direct, indirect, and cumulative impacts on, and loss of habitat for, special status plant and animal species (Appendix A, page A-62, lines 38-40).

We strongly support the mitigation hierarchy of first avoiding the most sensitive areas, then minimizing adverse impacts to the maximum extent practicable, then restoring adversely impacted areas to the maximum extent practicable, and finally offsetting residual and cumulative impacts. In the best-case scenario, avoidance, minimization and restoration measures will result in no change to the baseline conditions (e.g., extent and quality of habitat) for wildlife and special status species. However, best-case scenarios are rarely, if ever achieved and limiting mitigation to avoidance, minimization and restoration will typically result in a net

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reduction in baseline conditions. In order to achieve no net-loss, or better yet net-gain, and to fully compensate for residual and cumulative impacts, it is essential that offsets be a required component of all Ecological Resources Mitigation and Monitoring Plans.

We recommend that the mitigation hierarchy be applied to regional landscapes in a structured, consistent, transparent and environmentally-beneficial manner. We further suggest that this be achieved through the establishment of regional, market-based credit systems that provide for avoidance, minimization, restoration and offsets in a way that maximizes conservation benefits and cost-effectiveness of mitigation investments.

A regional, market-based credit system identifies and prioritizes habitat areas and management actions that are vital to wildlife and special status species conservation, ideally across the entire range of the species. This information is often already available in state wildlife actions plans or other conservation plans developed by agencies or conservation organizations. Habitat areas and improvements in baseline conditions that result from management actions are then quantified based on their conservation value and this quantification is identified as credits, which becomes the currency of mitigation. Specifically, the process for generating credits would involve (a) an assessment of current baseline conditions (evaluating factors such as threat of conversion and habitat extent and quality) and setting specific goals to increase the baseline, (b) planning protection (e.g., permanent easements) and management actions to increase the baseline, (c) implementing the prescribed protection and/or management actions (d) ongoing monitoring to determine if adequate progress is being made, (e) implementation of adaptive management if necessary and (f) accrual of credits once the specific increases to baseline have been achieved. In some cases credits may be generated immediately, such as when implementing a permanent easement to avoid near-term conversion of habitat.

Credits may be generated and accrued on both private and public lands. The options for generating credits on federal lands that already include a conservation mission and are permanently protected would be limited to actions that clearly resulted in an increase in baseline conditions such as purchasing and retiring grazing rights so as to benefit the desert tortoise (see the Clark County Desert Conservation Plan for additional examples: http://www.clarkcountynv.gov/Depts/dcp/Documents/Library/Guiding%20Docs/previous/2971_DesertConservationPlanAugust_1995.pdf).

Credits can be a simple measure such as acres of habitat (as is typically done for conservation banks), but we suggest that the science is sufficient for many species and habitats to enable a more robust measure of conservation value; one that incorporates habitat quality and contribution to conservation goals, in addition to acres. Adverse impacts (i.e., "debits") are quantified using the same metrics that are used to determine credits, such that a common currency is established. This type of credit-debit valuation enables us to establish a market-based trading system for offsets, to more accurately measure and monitor mitigation outcomes, and to accurately determine if all residual and cumulative impacts are being fully offset.

Regional market-based credit systems work by enabling landowners to generate and sell credits in a competitive environment to energy companies that need to offset debits resulting from residual and cumulative impacts. We envision that these systems will be most effective when a

program administrator serves to aggregate and broker the marketing of credits, perform management activities on enrolled lands, coordinate monitoring efforts and insure compliance. Funding for monitoring and managing a typical conservation bank is too often insufficient: the higher these expenses, the lower the potential profit of the conservation banker. Centralizing the monitoring and management roles in a program administrator will maximize the consistency with which these activities are conducted and minimize their expense by capturing economies of scale.

In part, a regional market-based credit system can be viewed as a programmatic conservation bank: Private landowners can sell credits based on the placement of a permanent easement on qualifying areas of their land. The process of establishing regional credit systems includes completing the administrative and legal requirements necessary to enable any qualified landowner within the designated landscape to easily and quickly convey a permanent easement and thereby sell permanent credits. This approach is essential to getting significant numbers of landowners engaged in the generation and sale of permanent conservation credits as the complexity, expense and time required for establishment of a typical conservation bank is beyond the resources of most landowners.

Regional credit systems also provide the ability for landowners to participate in species conservation and recovery efforts through term agreements (if appropriate for the species and habitat); a type of participation that is appealing to a broad range of landowners. Some adverse impacts are not perpetual and, in these cases it makes sense to offset temporary debits with temporary credits. Temporary credits that are generated through term agreements enable the accommodation of substantial shifts in species habitat distribution and/or quality over time due to climate change, disease, invasive species or other reasons. Term agreements may be allowed to expire in areas where habitat value may be declining due to one of the aforementioned reasons and new agreements may be executed in areas where habitat value is relatively higher or increasing.

Regional credit systems provide a mechanism that incentivizes the participation of large numbers of landowners across broad landscapes to achieve desired mitigation and conservation outcomes. The credit valuation and trading process insures that transactions result in conservation occurring at the highest priority habitat areas. The market-based nature of the system insures that the desired mitigation outcome is achieved at the lowest possible cost.

We request that the BLM and DOE incorporate regional market based habitat credit approach mitigation strategy described in this letter into the Final EIS as an approach to mitigating cumulative impacts.

Sincerely,

David Festa
Vice President, West Coast
Environmental Defense Fund

cc:

Mike Mantell, Resources Legacy Fund
Kim Delfino, Defenders of Wildlife
Laura Cane, The Nature Conservancy
David Hayes, Department of Interior
John Laird, Secretary of Resources, State of California

Thank you for your comment, Brendan Hughes.

The comment tracking number that has been assigned to your comment is SEDDsupp20163.

Comment Date: January 27, 2012 19:08:10PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20163

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To whom it may concern:

The Supplemental DEIS is somewhat improved from the original Solar DEIS. However, BLM and DOE still have light-years to go to get a document that makes sense and suits the needs of the American people. The SDEIS fails to take a common sense and balanced approach to renewable energy. It should address the renewable energy issue like the Restoration Design Energy Project in Arizona, which is looking at degraded and disturbed private lands as well as public lands. The EPA has already given suggestions (they even have a Google Earth layer-I've seen it) for suitable solar and wind locations on contaminated lands like Superfund sites. These documents and processes should be included in any analysis of solar development.

Another part of the problem is that the US government does not have a unified, national energy strategy that projects the growth in energy demand and how renewables play a part in addressing the energy issue. The scattershot approach of the BLM and DOE has led to the land rush on our public lands, and this document should have addressed reining this chaos in.

Instead of allowing for the large-scale privatization and pillaging of our public lands for private profit, as is the current model of the SDEIS and the Ivanpah Solar Project, BLM and DOE should assess the potential for the widespread installation of rooftop solar in residential, commercial, and industrial areas. BLM has dismissed this option time and time again, without ever stopping to assess the feasibility and viability of this type of approach. Rooftop solar is more cost effective while creating more jobs for American workers than industrial-scale, remote solar arrays. The only downside is that it spreads the wealth out amongst many individuals and entities, instead of profiting one giant corporation. Think of how many megawatts could have been installed on rooftops with the more than $1 billion in government aid that BrightSource received for the Ivanpah project. Rooftop solar is the best option for the American people, and it preserves our precious public lands all the while.

Finally, as part of a national energy strategy we need a greater focus on energy conservation and efficiency, as President Obama emphasized in his 2012 State of the Union address. We could reduce our energy use by approximately one-third with improvements in technology and by educating citizens about changes in habit. This should be the first order of business in any energy scheme, because it saves consumers money, creates jobs that cannot be outsourced, and truly protects our environment.

I implore BLM, DOE, and the Obama Administration to please take a wise, conscientious approach to energy development and use. Please don't sacrifice our pubic lands for political expediency and private profit.

Thank you for your consideration.

Brendan Hughes

Thank you for your comment, David Myers.

The comment tracking number that has been assigned to your comment is SEDDsupp20164.

Comment Date: January 27, 2012 19:14:04PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20164

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Attachment: SPEIS_TWC Comments_Jan 27 2012.pdf

Comment Submitted:

THE WILDLANDS CONSERVANCY

January 26, 2012

Solar Energy Draft PEIS
Argonne National Laboratory
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Dear Ladies and Gentlemen:

As an introduction to our comments on the Supplement to the Draft Programmatic Environmental Impact Statement (PEIS), The Wildlands Conservancy (TWC) is taken aback after several years of working closely with the Bureau of Land Management (BLM) and the Department of the Interior (DOI) to resolve conflicts. Lands donated by this organization were removed from the Solar Energy Zones except for several thousand acres. Now we find over 50,000 acres of donated lands within the variance area of the PEIS. Once again, it is important that we recount the history of these donated lands.

The Wildlands Conservancy negotiated a sale of more than 600,000 acres to the DOI from Catellus Development Corporation at less than half the fair market value of these lands. TWC went on to raise $45 million in private monies toward the acquisition of these lands. TWC also spent hundreds of thousand of dollars in what was the largest Phase I/land cleanup in California history. This cost TWC hundreds of thousand of dollars to just demolish wells and mining sites that were unacceptable to the BLM. Trash and dump sites were removed from more than 100 parcels, all paid for by TWC. The United States government repeatedly represented that these lands would be protected in perpetuity. Please see the attached letter from former President Bill Clinton, a press release by former Vice President Al Gore, a press release by former Interior Secretary Bruce Babbitt, a letter from Senator Dianne Feinstein, a letter from past BLM National Director Tom Fry, and a letter from past BLM California State Director Al Wright.

Specific strategies were employed to protect these lands in perpetuity. BLM rendered a written opinion to TWC that if we commingled our private monies with Land and Water Conservation Fund monies, then use of the LWCF monies would make clear the intent of Congress that these lands would be set aside for conservation. In addition, BLM did a mineral survey of Catellus lands outside of Wilderness Areas and National Parks, and requested that TWC retain the mineral estate on properties of high mineral value so that those lands could not be exploited. In Imperial County, where no LWCF monies were

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available to commingle with private funds, BLM sought to ensure conservation values by asking TWC to retain the entire mineral estate. As further assurance, the mineral rights were split from the surface entry rights, to be held by BLM, so that both parties could mutually assure these lands would not be exploited in the future.

Now we find 50,000 acres of these donated lands, which were pledged for permanent protection, proposed as "variance" areas for energy projects. How can a small nonprofit organization that cannot by law contribute directly to political campaigns, protect its conservation legacy when the donors to the Obama administration, who want to exploit these lands, are receiving billions of dollars in federal stimulus money? If theses lands are allowed to be exploited, the vision and idealism of our organization, which has never taken public money and looks at all of its work as a gift to the American people, will be eviscerated. If this exploitation of donated lands goes forward, it will be looked at in a historic perspective in the same manner the U.S. government broke its treaties with the American Indians. It will also confirm the lowest form of cynicism that is so prevalent in our society today: that no good deed goes unpunished, that government only responds to monetary influence, and that the word of U.S. Presidents, Vice Presidents and Interior Secretaries are without merit or meaning.

The comments attached for the Supplemental Draft Solar Programmatic Environmental Impact Statement are by young TWC preserve managers who have degrees in biology, live on our desert preserves, and interface with tens of thousands of desert visitors each year. These young people are in tune with natural rhythms of the land and have their hands on the pulse of the desert. These comments are much different than those of the National Defense Resource Council whose comments are influenced by their attorney, Robert F. Kennedy, Jr., who is a major investor in BrightSource and is working closely with British Petroleum, Chevron Energy and Bechtel, preventing the democratization of energy through rooftop solar. The roughly $35 billion given to major energy projects for stimulus grants could have installed rooftop solar on 3.5 million houses. Instead this administration touts the BrightSource project as its signature project, a project that is not green but is actually a natural-gas-fired plant which has destroyed tortoise populations and public lands at an increase to rate payers.

TWC spent considerable time identifying enough private disturbed and degraded land for all California's renewable energy goals. What is it in our changing culture that has made us rush to destroy the beauty, solitude and inspiration of pristine public lands?

Sincerely,

David Myers

David Myers
TWC Executive Director

January 27, 2012

Solar Energy Draft PEIS
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Comments on the Supplement to the Draft Solar Programmatic Environmental Impact Statement

The Bureau of Land Management's (BLM) current Preferred Alternative in the Supplement to the Draft Solar Programmatic Environmental Impact Statement (Supplement) is pushed by an Obama administration agenda to open far more public land to utility scale solar development in the California desert than is necessary, even by the Supplement's own calculations (Supplement Table 1.6-1). The proposed "variance" process goes against the entire idea of siting development areas in responsible ways to minimize conflicts. **For this reason, The Wildlands Conservancy (TWC) opposes the BLM's current "Preferred Alternative" of the modified program approach that includes a variance process.** By sacrificing public lands, the program forces resources away from degraded and other private land, robbing local communities of much of the benefit from energy projects. This process would put 1.5 million acres of land currently open to the public for recreation under threat of becoming privatized for the purpose of feeding profits to some of the same corporations that have presided over environmental and financial catastrophes elsewhere. We would hope that the development of renewable energy to meet the challenge of global climate change would be encouraging and fruitful. Unfortunately, the decision to steamroll local stakeholders in the interest of corporate politics has turned what could be a unifying effort into a divisive conflict.

Because of the consensus process completed to identify and refine the solar energy zones, we support the modified SEZ alternative. Siting has long been recognized as the key issue in developing land intensive renewable energy projects, which is why TWC signed on with a group of organizations to Renewable Siting Criteria (Attachment 1). The zone-only approach is the closest alternative to this criteria.

Catellus Lands

The Wildlands Conservancy absolutely rejects the idea that a variance process can or will be carried out in a responsible way. Under the variance process, nearly 50,000 acres of conservation lands purchased by TWC with private monies and donated to the Department of the Interior (DOI) will be opened to industrial solar development (see attachment 2). TWC's purchase of these and other private checkerboard lands was hailed by the BLM at the time as being of great value to its conservation goals. The total purchase represents the largest nonprofit land gift to the American public in United States history, and was intended to keep land open for public enjoyment and ecosystem health. It was completed using not only 45 million dollars of TWC's privately raised funds, but also millions of public dollars through the Land and Water Conservation Fund. Including these lands in a variance process is an egregious violation of public trust, and goes against promises made to TWC by the Clinton administration and BLM Director Tom Fry at the time of the donation agreement (see attachments 3-8). All of these donated lands should immediately be taken out of the variance envelope and put in the

"Proposed Right-of-Way Exclusion Areas" (Section 2.2.2.1 in Supplement). That they were included in the variance at all is alarming.

Here is just one example of the blatant disregard for good faith stewardship of these donated lands: Just south of state Highway 78 near the San Sebastian Marsh/San Felipe Creek ACEC, several thousand acres of donated Catellus lands are on the table for variance applications, while all of the other public lands that surround these checkerboard sections are closed to variance applications. This is a direct affront to TWC's multi-year effort. How is it that these lands, purchased and donated for conservation, would come open for variance applications, while public lands just next to them remain closed to applications under the preferred alternative?

Furthermore, while the Supplement states that lands inside of the proposed Mojave Trails National Monument will be in an Exclusion Area, an application still exists on these lands on the "Pending Applications" list in the Supplement. BrightSource Energy holds application CACA 048875 for a project in the Broadwell Valley, inside the proposed Monument. The only language that suggests pending applications in Exclusion Areas may not be ultimately be accepted is found in lines 14-16 on page 31 of the Supplement: "Pending applications on lands proposed as exclusion areas for utility-scale solar energy development in the Final Solar PEIS are likely candidates for denial." The continued presence of this project and the gentle language in the Supplement regarding its future only add to the feeling that this process is being completed in bad faith. This project should be removed from the application list immediately.

The Wildlands Conservancy intended that the Catellus purchase would be a gift to the American public, keeping huge areas of the California desert permanently open for outdoor enthusiasts, wildlife, and ecosystem processes. We now see, after repeated attempts to permit these donated lands for development, that the administration is intent on pushing agendas, not conservation or public recreation. For this reason, we are demanding that for every acre of donated Catellus land destroyed by development, DOI shall make reparation payments to TWC at fair market value, rather than make it available for energy exploitation at no cost to the administration's donors.

Solar Energy Zones

The solar energy zones were chosen with the intent of minimizing possible conflicts with existing land uses, and more than enough land has been identified in these zones to meet imminent renewable energy goals. According to the estimates included in the Supplement, the amount of public land needed for solar energy development (138,769 acres by 2030) is less than the acreage identified in the zones (over 150,000 acres), and far less than the variance areas plus the zones (1.5 million acres).

The Desert Renewable Energy Conservation Plan (DRECP) is creating a process in California by which additional solar energy zones, including both private and public land, will be identified. In short, there is no need for a variance process to be a part of the solar energy program to meet our renewable energy goals. Any form of a variance process should be dropped from further consideration; the zone-only approach should be pursued; and continued refinement of existing zones and establishment of future zones should be left to the DRECP.

Low Conflict Alternatives

It is apparent that any of the three alternatives in this document could create a self-fulfilling prophecy that the majority of solar development will occur on public land unnecessarily and to the public's detriment. The PEIS has undercut a truly low conflict alternative to use hundreds of thousands of acres of marginal or abandoned farmlands in the California Desert and the San Joaquin and Central Valleys. TWC completed an inventory in 2010 of over 225,000 acres of disturbed and degraded lands with willing sellers along transmission corridors that could host utility scale renewable energy development on large parcels of land (Attachment 9). Instead, the administration has chosen to unnecessarily sacrifice vast landscapes, habitats, open space areas, and wildlife corridors. Beginning with the assumption that 75% of solar energy development would occur on public lands, the Obama administration has been pushing its agenda through any obstacle. By forcing the process of renewable energy onto public land, the administration has undercut the possibility that this development could have happened on private degraded lands or on rooftops that exist throughout the state. Despite continued requests for alternatives that would address distributed generation in any serious way, no sound discussion has taken place in the Draft Solar PEIS or the Supplement, just a categorical dismissal. This is in spite of thorough research indicating that rooftops in California could provide incredible amount of solar generated power, according to a study published by the California Energy Commission in April of 2005, "California Solar Resources".

While it is true that the Bureau cannot influence the development of private solar rooftops and other sources of distributed generation on private land, the Department of Energy (DOE) is contributing to the Solar PEIS. If DOE is co-authoring the PEIS and supplement, then it can and should create a thorough discussion of a distributed generation and degraded lands alternative to utility scale approaches in the document. There has been no national effort from DOE to encourage rooftop solar installation or private degraded lands installation, but rather a rush to site projects on public lands, and spend public monies on grants and loan guarantees. DOE should justify why billions of stimulus dollars are flowing to corporations instead of private land owners for energy conservation investments and roof top solar, programs like the California's AB811, or being used as incentives to direct companies to degraded farmland.

Ecosystem Functions

The Mojave Desert is a storied landscape and one of the last remaining intact ecosystems in the world. As we learn more about the desert, we realize what a unique place it is. Ancient creosote rings, old growth yucca forests, an amazing diversity of reptiles, unique lava flows frozen in time, and cryptobiotic soils and mycorrhizae that soak up carbon dioxide: All are special attributes that science and agencies have identified and are making attempts to manage properly. Not only does the variance process threaten to cut the desert ecosystem in two between Blythe and Barstow, but it could directly threaten ecosystem functions; here are two examples.

The Sheephole Mountains Wilderness south of Amboy is home to a resident herd of bighorn sheep, many of which were part of a reintroduction effort to boost dwindling numbers. The northwest edge of the Sheephole Mountains Wilderness gives way to the Cadiz Valley and the Cadiz Dunes Wilderness, named for sand dunes that

are dependent on the sand transport corridor in the area. We know from studies of the bighorn sheep populations in the desert that there is occasional movement between home ranges which leads to long term stability of populations (Epps, et al. 2010) and that development inside a corridor affects this movement negatively. South Coast Wildlands is currently working on a study of this and other movement corridors in the California Desert to elucidate what possible routes of travel sheep and other animals have between the Sheephole Mountains, the Cadiz Dunes Wilderness, and the Old Woman Mountains, which could be negatively impacted by industrialization in the Cadiz Dunes area. Industrializing the landscape around the Cadiz Dunes not only could block a sand transport corridor, but also runs directly counter to the conservation investments that the American people have made to reintroduce sheep, and is a breach of public trust.

Another example that is well known is the effect on desert tortoise populations by the Ivanpah Solar Energy Generating Station in the Ivanpah Valley. While Brightsource completed a survey of tortoise in its project area as part of an environmental review, its predicted number of affected tortoises was underestimated by an order of magnitude. This project illustrates one of the major problems with the proposed variance process. Allowing industrial scale energy projects on large patches of pristine land will have unforeseen and unmitigatable consequences on the local ecosystem. These destructive projects run counter to years of investment and many millions of dollars to save the desert tortoise from extinction, and to protect the resources of the California Desert. We request that all further development in the Ivanpah Valley be prohibited, and that area become as Area of Critical Environmental Concern as outlined by the Basin and Range Watch, Desert Tortoise Council and Desert Protective Council.

To avoid conflicts such as these while our understanding grows, TWC recommends that the Solar PEIS adopt the Recommendations of Independent Science Advisors (ISA) for the DRECP. In particular, a “no regrets” strategy should be adopted as outlined in the ISA recommendations. To achieve this end, the variance process should be dropped, and a zone only approach adopted, and only those portions of zones that are appropriate.

Conclusion

The PEIS does not provide for any alternatives that are truly for the greater good. Instead, they have laid out yet another set of limited options that waste public funds, destroy public lands needlessly, and line the pockets of profit driven corporations.

We encourage the Final PEIS to address the issues raised here that are of great importance to local stakeholders who recognize the long term value of keeping our desert intact.

Literature Cited

Epps, Clinton W. John D. Wehausen, Per J. Palsbøll, and Dale R. McCullough. April 2010. Using Genetic Tools to Track Desert Bighorn Sheep Colonizations. *Journal of Wildlife Management.* 74(3):522-531

Audubon California
California Native Plant Society * California Wilderness Coalition
Center for Biological Diversity * Defenders of Wildlife
Desert Protective Council * Mojave Desert Land Trust
National Parks Conservation Association
Natural Resources Defense Council * Sierra Club * The Nature Conservancy
The Wilderness Society * The Wildlands Conservancy

Renewable Siting Criteria for California Desert Conservation Area

Environmental stakeholders have been asked by land management agencies, elected officials, other decision-makers, and renewable energy proponents to provide criteria for use in identifying potential renewable energy sites in the California Desert Conservation Area (CDCA). Large parts of the California desert ecosystem have survived despite pressures from mining, grazing, ORV, real estate development and military uses over the last century. Now, utility scale renewable energy development presents the challenge of new land consumptive activities on a potentially unprecedented scale. Without careful planning, the surviving desert ecosystems may be further fragmented, degraded and lost.

The criteria below primarily address the siting of solar energy projects and would need to be further refined to address factors that are specific to the siting of wind and geothermal facilities. While the criteria listed below are not ranked, they are intended to inform planning processes and were designed to provide ecosystem level protection to the CDCA (including public, private and military lands) by giving preference to disturbed lands, steering development away from lands with high environmental values, and avoiding the deserts' undeveloped cores. They were developed with input from field scientists, land managers, and conservation professionals and fall into two categories: 1) areas to prioritize for siting and 2) high conflict areas. The criteria are intended to guide solar development to areas with comparatively low potential for conflict and controversy in an effort to help California meet its ambitious renewable energy goals in a timely manner.

Areas to Prioritize for Siting

- Lands that have been mechanically disturbed, i.e., locations that are degraded and disturbed by mechanical disturbance:
  - Lands that have been "type-converted" from native vegetation through plowing, bulldozing or other mechanical impact often in support of agriculture or other land cover change activities (mining, clearance for development, heavy off-road vehicle use).[1]
- Public lands of comparatively low resource value located adjacent to degraded and impacted private lands on the fringes of the CDCA:[2]
  - Allow for the expansion of renewable energy development onto private lands.
  - Private lands development offers tax benefits to local government.
- Brownfields:
  - Revitalize idle or underutilized industrialized sites.
  - Existing transmission capacity and infrastructure are typically in place.

- Locations adjacent to urbanized areas:[3]
    - Provide jobs for local residents often in underserved communities;
    - Minimize growth-inducing impacts;
    - Provide homes and services for the workforce that will be required at new energy facilities;
    - Minimize workforce commute and associated greenhouse gas emissions.
- Locations that minimize the need to build new roads.
- Locations that could be served by existing substations.
- Areas proximate to sources of municipal wastewater for use in cleaning.
- Locations proximate to load centers.
- Locations adjacent to federally designated corridors with existing major transmission lines.[4]

High Conflict Areas

In an effort to flag areas that will generate significant controversy the environmental community has developed the following list of criteria for areas to avoid in siting renewable projects. These criteria are fairly broad. They are intended to minimize resource conflicts and thereby help California meet its ambitious renewable goals. The criteria are not intended to serve as a substitute for project specific review. They do not include the categories of lands within the California desert that are off limits to all development by statute or policy.[5]

- Locations that support sensitive biological resources, including: federally designated and proposed critical habitat; significant[6] populations of federal or state threatened and endangered species,[7] significant populations of sensitive, rare and special status species,[8] and rare or unique plant communities.[9]
- Areas of Critical Environmental Concern, Wildlife Habitat Management Areas, proposed HCP and NCCP Conservation Reserves.[10]
- Lands purchased for conservation including those conveyed to the BLM.[11]
- Landscape-level biological linkage areas required for the continued functioning of biological and ecological processes.[12]
- Proposed Wilderness Areas, proposed National Monuments, and Citizens' Wilderness Inventory Areas.[13]
- Wetlands and riparian areas, including the upland habitat and groundwater resources required to protect the integrity of seeps, springs, streams or wetlands.[14]
- National Historic Register eligible sites and other known cultural resources.
- Locations directly adjacent to National or State Park units.[15]

EXPLANATIONS

[1] Some of these lands may be currently abandoned from those prior activities, allowing some natural vegetation to be sparsely re-established. However, because the desert is slow to heal, these lands do not support the high level of ecological functioning that undisturbed natural lands do.

[2] Based on currently available data.

[3] Urbanized areas include desert communities that welcome local industrial development but do not include communities that are dependent on tourism for their economic survival.

[4] The term "federally designated corridors" does not include contingent corridors.

[5] Lands where development is prohibited by statute or policy include but are not limited to:

National Park Service units; designated Wilderness Areas; Wilderness Study Areas; BLM National Conservation Areas; National Recreation Areas; National Monuments; private preserves and reserves; Inventoried Roadless Areas on USFS lands; National Historic and National Scenic Trails; National Wild, Scenic and Recreational Rivers; HCP and NCCP lands precluded from development; conservation mitigation banks under conservation easements approved by the state Department of Fish and Game, U.S. Fish and Wildlife Service or Army Corps of Engineers a; California State Wetlands; California State Parks; Department of Fish and Game Wildlife Areas and Ecological Reserves; National Historic Register sites.

[6] Determining "significance" requires consideration of factors that include population size and characteristics, linkage, and feasibility of mitigation.

[7] Some listed species have no designated critical habitat or occupy habitat outside of designated critical habitat. Locations with significant occurrences of federal or state threatened and endangered species should be avoided even if these locations are outside of designated critical habitat or conservation areas in order to minimize take and provide connectivity between critical habitat units.

[8] Significant populations/occurrences of sensitive, rare and special status species including CNPS list 1B and list 2 plants, and federal or state agency species of concern.

[9] Rare plant communities/assemblages include those defined by the California Native Plant Society's Rare Plant Communities Initiative and by federal, state and county agencies.

[10] ACECs include Desert Tortoise Desert Wildlife Management Areas (DWMAs). The CDCA Plan has designated specific Wildlife Habitat Management Areas (HMAs) to conserve habitat for species such as the Mohave ground squirrel and bighorn sheep. Some of these designated areas are subject to development caps which apply to renewable energy projects (as well as other activities).

[11] These lands include compensation lands purchased for mitigation by other parties and transferred to the BLM and compensation lands purchased directly by the BLM.

[12] Landscape-level linkages provide connectivity between species populations, wildlife movement corridors, ecological process corridors (e.g., sand movement corridors), and climate change adaptation corridors. They also provide connections between protected ecological reserves such as National Park units and Wilderness Areas. The long-term viability of existing populations within such reserves may be dependent upon habitat, populations or processes that extend outside of their boundaries. While it is possible to describe current wildlife movement corridors, the problem of forecasting the future locations of such corridors is confounded by the lack of certainty inherent in global climate change. Hence the need to maintain broad, landscape-level connections. To maintain ecological functions and natural history values inherent in parks, wilderness and other biological reserves, trans-boundary ecological processes must be identified and protected. Specific and cumulative impacts that may threaten vital corridors and trans-boundary processes should be avoided.

[13] Proposed Wilderness Areas: lands proposed by a member of Congress to be set aside to preserve wilderness values. The proposal must be: 1) introduced as legislation, or 2) announced by a member of Congress with publicly available maps. Proposed National Monuments: areas proposed by the President or a member of Congress to protect objects of historic or scientific interest. The proposal must be: 1) introduced as legislation or 2) announced by a member of Congress with publicly available maps. Citizens' Wilderness Inventory Areas: lands that have been inventoried by citizens groups, conservationists, and agencies and found to have defined "wilderness characteristics." The proposal has been publicly announced.

[14] The extent of upland habitat that needs to be protected is sensitive to site-specific resources. For example: the NECO Amendment to the CDCA Plan protects streams within a 5-mile radius of Townsend big-eared bat maternity roosts; aquatic and riparian species may be highly sensitive to changes in groundwater levels.

[15] Adjacent: lying contiguous, adjoining or within 2 miles of park or state boundaries. (Note: lands more than 2 miles from a park boundary should be evaluated for importance from a landscape-level linkage perspective, as further defined in footnote 12).

Attachment 2

TWC DOANTED CATELLUS LANDS WITHIN PROPOSED BLM VARIANCE AREA

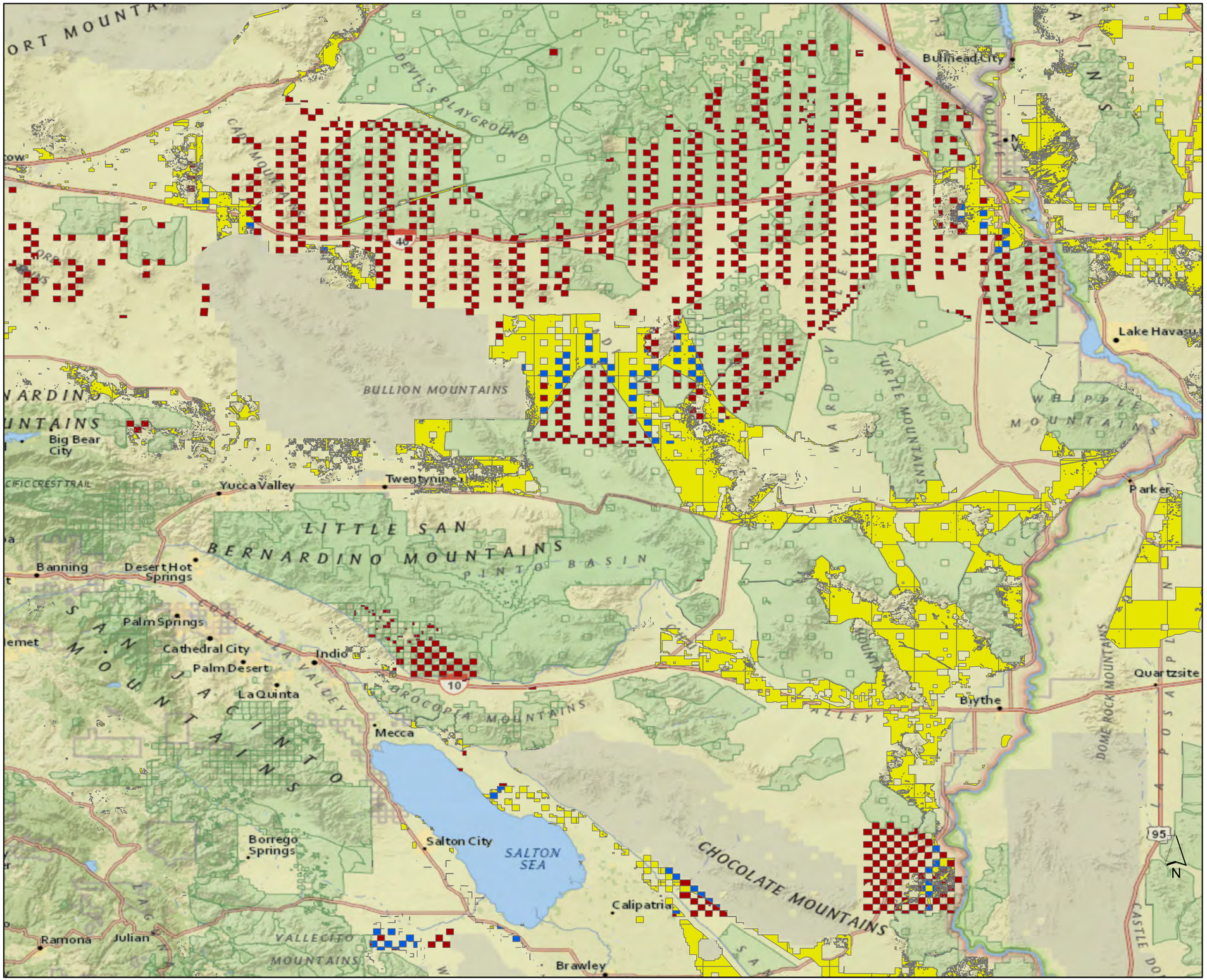
Catellus Lands

BLM Variance Area

1,354,559 acres in California

Catellus Lands Within BLM Variance Area

Just under 50,000 acres



Data Sources:
TWC GIS data created by TetraTech
Solar Energy Development PEIS - Information Center
ESRI ArcGIS Online (base map)

Data Retrieved: January 24, 2012

Date Saved: 1/27/2012 4:12:35 PM

DISCLAIMER: The Wildlands Conservancy (TWC) has made best efforts to ensure accuracy and quality in producing this map. However, the information on which it is based may have come from any of a variety of sources of varying degrees of accuracy beyond TWC's control. TWC cannot guarantee complete accuracy of this map and is not responsible for any unintended consequences derived from its use.

The Wildlands Conservancy
39611 Oak Glen Road, Bldg. 12
Oak Glen, California 92399
www.wildlandsconservancy.org

Path: C:\TWC_GIS\Maps\TWCProjects\DraftSolarPEIS\DraftSolarPEIS_VarianceArea_2.mxd

THE WHITE HOUSE

WASHINGTON

May 10, 2000

Mr. David Myers
Executive Director
The Wildlands Conservancy
3961 Oak Glen Road
Yucaipa, California 92399

Dear David:

I want to thank you and The Wildlands Conservancy for donating land to the United States for inclusion in Joshua Tree National Park. Your donation of more than 14,000 acres will help protect and preserve fragile desert resources and provide the American people with additional natural areas to treasure and enjoy.

I deeply appreciate your efforts to protect sensitive lands in the California Desert for the National Park Service and Bureau of Land Management. I assure you that my Administration will work to protect and manage the donated lands.

Please convey my appreciation to the Conservancy's Board of Directors, staff, donors, and supporters for this historic donation and all of your work to acquire additional lands for permanent protection.

Sincerely,

Bill Clinton

THE WHITE HOUSE

Office of the Vice President

For Immediate Release
Thursday, May 18, 2000

Contact:
(202) 456-7035

VICE PRESIDENT GORE ANNOUNCES NEW LAND PROTECTIONS IN CALIFORNIA DESERT

Calls on Congress to Pass Administration's Lands Legacy Initiative

Washington, DC -- Vice President Al Gore announced today that the Administration and a non-profit conservation organization have secured the money needed to complete a historic acquisition of pristine desert lands in Southern California. The Vice President also called on Congress to support the Administration's Lands Legacy initiative, which includes funding to protect nearby lands from future development.

Under the funding package announced today, the National Park Service (NPS) and the Bureau of Land Management (BLM) will acquire 180,605 acres within and adjacent to federally protected lands between Barstow and Needles. The land will be purchased from the Catellus Development Corporation with $5 million in federal funds secured by the Administration in the fiscal year 2000 budget and a $15 million donation from The Wildlands Conservancy.

"These stunning California Desert lands are being preserved for future generations through a true public-private team effort that could serve as a model in other areas," said Vice President Gore. "I commend the Wildlands Conservancy for its hard work and generosity. Protecting magnificent lands through this type of partnership is a central goal of our Lands Legacy initiative."

The purchase, to be completed within the next month, builds on the California Desert Protection Act signed by President Clinton in 1994. The Act, sponsored by Senator Dianne Feinstein, provided new or enhanced protection for 6.6 million acres, including the new Mojave National Preserve and 69 BLM wilderness areas.

Under an agreement in principle announced in December 1998, Catellus agreed to transfer to the federal government a total of 405,000 acres within and around the lands protected by the 1994 Act. Although the lands were valued at $61.6 million, Catellus agreed to a purchase price of $45 million. The first phase of the acquisition was completed earlier this year with $10 million in federal funds and $15 million from the Wildlands Conservancy. Today's announcement sets the stage for completing the second and final phase of the acquisition.

The areas to be protected include some of the most pristine and scenic desert lands in the world. Their features include cinder cones and lava flows, spectacular ranges of rock and

flowing sand dunes, vast valleys, intriguing cactus gardens and important habitat for the endangered Desert Tortoise. Approximately 83,000 acres will be acquired by the Park Service within the Mojave National Preserve, and the Bureau of Land Management will acquire approximately 97,000 acres, including lands in six designated wilderness areas – Clipper Mountains, Dead Mountains, Piute Mountains, Bristol Mountains, Old Woman Mountains and the Chemehuevi Mountains wilderness.

The Vice President commended Senator Feinstein for her leadership in securing the federal funds; The Wildlands Conservancy for its generous donation; and Catellus for selling the land at a substantially discounted price.

The Administration's proposed fiscal year 2001 budget included $15 million to complete the second phase of the acquisition. In light of The Wildlands Conservancy donation, the Administration yesterday proposed redirecting the proposed fiscal year 2001 funding to acquire other critical California desert lands on a willing-seller basis.

Unfortunately, Congress' budget failed to provide funding for the President's Lands Legacy Initiative. As a result, the House Interior Appropriations Subcommittee yesterday could only provide a small portion of needed land acquisition funding, with no funding to acquire critical desert lands. "I am deeply disappointed that Congress is slashing funds that would allow us to forge other partnerships like this one to protect critical lands across America," the Vice President said. "I urge Congress to provide permanent and full funding for Lands Legacy so we can provide states and communities the resources they need to protect their precious green spaces."

Today's acquisition completes the largest purchase of private land in California's history and the largest purchase of land from one seller by the Bureau of Land Management in its 50-year history. Once acquired, the lands would be open to public access for outdoor recreation including hiking, hunting and other permitted uses.

Additional details are available on The Wildlands Conservancy website: *www.wildlandsconservancy.org*

# # #

NEWS
U.S. DEPARTMENT OF THE INTERIOR

Office of the Secretary
For Immediate Release
Jan. 15, 1999

Contact: Tim Ahern, (202)-208-5089
Jan Bedrosian, (916)-978-4616
Holly Bundock, (415)-427-1320

***** MEDIA ADVISORY *****

Babbitt Will Kick Off Mojave Acquisition, Largest Land Deal in California History

Secretary of the Interior Bruce Babbitt will go to the Palm Springs area of Southern California on Wednesday, Jan. 20, to take title to the first 10,000 acres of private lands in the California Desert that will be acquired by the federal government as part of President Clinton's Lands Legacy Initiative.

Almost 500,000 acres of private lands will be acquired through an unprecedented match of private and public funds. The $36 million in federal money will come from the Land and Water Conservation Fund while $25.5 million in private funds is being contributed by The Wildlands Conservancy, a non-profit organization based in Oak Glen, Calif.

"This is an incredible opportunity to preserve a half-million acres of private land which has been interspersed among the new National Parks created by the California Desert Protection Act of 1994," Babbitt said.

On Jan. 20, The Wildlands Conservancy will give Babbitt title to some of the land it has already acquired in the area, including parcels in the San Gorgonio Wilderness, managed by the Bureau of Land Management, and Joshua Tree National Park.

Most of the land to be acquired is owned by the Catellus Development Corp., formerly the land-holding arm of the railroads. The rest of the land is owned by a variety of persons.

Who: Bruce Babbitt, Secretary of the Interior; and other federal officials and representatives of landowners and local and conservation interests

What: The federal government will take title to the first 10,000 acres of land, of a total of about 500,000 acres, that will be acquired in the California desert

When: 12:30 p.m. PST, Wednesday, Jan. 20, 1999

Where: Visitor center at the Santa Rosa Mountains National Scenic Area
51-500 California route 74, Palm Desert, California
(Map to event site is attached)

Contact: Tim Ahern, 202-208-5089 (Department of Interior)
Jan Bedrosian, 916-978-4614 or Carole Levitzky (Bureau of Land Management, California)
Holly Bundock, 415-427-1320 (National Park Service)
David Myers, 909-797-8507 (The Wildlands Conservancy)
John Bezzant, 213-473-3102 (Catellus Corp.)

-DOI-

IANNE FEINSTEIN
CALIFORNIA

COMMITTEE ON FOREIGN RELATIONS
COMMITTEE ON THE JUDICIARY
COMMITTEE ON RULES AND ADMINISTRATION

United States Senate

WASHINGTON, DC 20510-0504
(202) 224-3841

December 10, 1998

The Honorable William Jefferson Clinton
President of the United States
The White House
1600 Pennsylvania Avenue, N.W.
Washington, D.C. 20500

Dear Mr. President:

I am writing to urge you to include $36 million for land acquisition in the California Desert in your fiscal year 2000 budget request. This funding would allow completion of a landmark bid by the Wildlands Conservancy to permanently protect up to 475,000 acres of inholdings in the California Desert's national parks and wilderness areas. Protecting these areas is vital to preserving the unique character and public accessibility of the California Desert.

As you know, I fought to ensure passage of the Desert Protection Act, which you signed into law in 1994. The Desert Protection Act created two new national parks, a national preserve, and over 100 new wilderness areas. Unfortunately, our work is not done. Hundreds of thousands of acres of inholdings in the Desert remain unprotected. Many of these inholdings are in a "checkerboard" pattern, strategically located so that the land effectively blocks access to public lands. Owners of the inholdings, including the Catellus corporation, are making plans to develop their land. This would compromise the California Desert's fragile ecosystem and severely limit recreation opportunities on Federal land.

The Wildlands Conservancy has developed an innovative plan to purchase these inholdings and transfer them to Federal ownership, protecting them permanently from development. The Conservancy proposes to use a combination of Federal and private funds to acquire 475,000 acres of inholdings, mostly owned by Catellus. The Conservancy has pledged $16 million in private funds for the effort. I strongly believe that the Federal government should provide the remaining $36 million to complete this acquisition.

The National Park Service and U.S. Bureau of Land Management are already on record supporting the Wildlands Conservancy proposal. In an interview with the Los Angeles Times, Park Service Regional Director John Reynolds said, "The Wildlands Conservancy effort is ambitious and dramatic. It will be a great day for the Desert."

FRESNO OFFICE:
1130 "O" Street

LOS ANGELES OFFICE:
11111 Santa Monica Blvd.
Suite 915

SAN DIEGO OFFICE:
750 "B" Street
Suite 1030

SAN FRANCISCO OFFICE:
525 Market Street
Suite 3670

Moreover, in a letter dated November 24, U.S. Bureau of Land Management State Director Ed Hastey wrote, "Clearly, the reality of the situation in the California Desert with the checkerboard Catellus lands calls for a public/private partnership to leverage your contributions more effectively. The Wildlands Conservancy's pledge of more than $16 million in cash and land...to hopefully be matched with appropriations from the Federal Land and Water Conservation Fund, will give the California Desert the national attention this region deserves. BLM-California will do all it can to support your innovative and bold initiative."

Attached are two letters from The Wildlands Conservancy that explain this proposal in more detail. The Wildlands Conservancy land acquisition proposal will protect endangered species habitat, keep the Desert ecosystem intact, and improve recreation opportunities for millions of Americans. As a member of the Interior Appropriations Subcommittee, I intend to make the Wildlands Conservancy acquisition one of my top environmental priorities in the next Congress. I do hope that I can count on your support and assistance. Please take an important first step by including $36 million for the acquisition in your budget request.

Thank you so much for your attention to this important matter. Please let me know what you decide. If you have any questions or require further information, please do not hesitate to get in touch, or have your staff contact Kathy Reich in my office at (202) 224-3841.

May I take this opportunity to wish you and your family a happy and healthy holiday season.

With warmest personal regards.

Sincerely yours,

Dianne Feinstein
United States Senator

DF:kdr

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Washington, D.C. 20240
http://www.blm.gov

OCT 3 0 2000

David Myers
Wildlands Conservancy
39611 Oak Glen Road
Yucaipa, CA 92399

Dear Mr. Myers:

It is truly an honor to present you, representing the board of The Wildlands Conservancy, the Bureau of Land Management's (BLM) national Legacy of the Land Award.

The Conservancy, a relatively young organization, has very quickly earned a national reputation for protecting magnificent lands through unprecedented public-private partnerships.

Most notable is the recent completion of the year-and-half-long effort to protect more than 405,000 acres of checkerboard railroad lands, formerly owned by Catellus Corporation, in what Vice President Al Gore called "an historic acquisition of pristine lands in Southern California."

Through the Conservancy's efforts, the BLM and the National Park Service now own critical inholdings in what the Vice President called "some of the most pristine and scenic desert lands in the world." In addition to scenic lands in the Park Service's Mojave National Preserve, BLM was also able to acquire 322,500 acres in 10 designated Wilderness Areas, almost a dozen sensitive wildlife habitat areas, and several key recreational access areas.

These areas are part of spectacular mountain ranges, with unique geological formations, including mountainous landscapes, sweeping bajadas and flowing sand dunes. They contain habitat for a number of threatened and endangered species, including bighorn sheep and desert tortoise. Without the Conservancy's innovation and leadership, these lands could have been developed or sold into private ownership, which would have had far-reaching implications to the surrounding wilderness and wildlife habitat areas.

While this is a tremendous accomplishment, California's diverse but threatened landscapes need further efforts from BLM and the Conservancy. BLM looks forward to a long and productive relationship with you and your talented and generous board. This award is in recognition of both the accomplishment and the future legacy to come.

Sincerely,

Tom A. Fry
Director
Bureau of Land Management

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
California State Office
2800 Cottage Way, Suite W1834
Sacramento, CA 95825-1886
www.ca.blm.gov

AUG 9 2000

David Myers
Executive Director
The Wildlands Conservancy
39611 Oak Glen Road
Yucaipa, CA 92399

Dear David:

On behalf the Bureau of Land Management, and especially all of us here in California, I would like to officially thank you, the Board of Directors of The Wildlands Conservancy, and your many generous donors for the tremendous achievement of completing the acquisition of Catellus lands in the California Desert recently.

It is an incredible success story and demonstrates the "big picture" vision of the Conservancy, which you so ably lead. At every obstacle, a path to the final goal was found. As a consequence, the public now enjoys ownership of the 405,000 acres the conservancy helped BLM and the Park Service acquire. Present and future generations will benefit greatly, as will the land itself and its wildlife resources.

Your ability to develop alliances and pool resources was truly the essence of what made this achievement possible. BLM will take very good care of these newest public lands and we look forward to a long-term relationship with you and the Conservancy.

Sincerely,

Al Wright

Al Wright
Acting State Director

DAVID -
MY UNQUALIFIED
THANKS FROM US
AT BLM AND
THE PUBLIC -
AL

NEWS RELEASE

March 10, 2010

Conservancy Identifies Available Land for California to Increase Renewable Energy Goals

Contact: David Myers, Executive Director, The Wildlands Conservancy
April Sall, Conservation Director, The Wildlands Conservancy
Joan Taylor, Chair, Sierra Club Desert Energy Committee

The Wildlands Conservancy (TWC) inventoried over 225,000 acres of primarily disturbed and degraded lands along major transmission corridors on which the owners support renewable energy development. This is almost twice the 128,000 acres the California Energy Commission said is needed for California to meet its 2020 goal of being 33% reliant on clean renewable solar energy. Elden Hughes, honorary vice-president of the Sierra Club, stated, "The Wildlands Conservancy's inventory will take pressure off destroying our pristine Bureau of Land Management (BLM) lands." Joan Taylor, Chair of the Sierra Club's Desert Energy Committee, remarked, "We have been saying all along that there are enough impacted lands to meet our state renewable energy goals. Now we have an inventory that proves it."

TWC became involved in finding alternative locations for solar projects after lands TWC purchased for conservation were subsequently opened for solar applications by the Bush Administration. When TWC donated these lands, representing the largest land gift in American history, President Bill Clinton, Vice President Al Gore, and Interior Secretary Bruce Babbitt promised the lands permanent protection. In December 2009 Senator Dianne Feinstein introduced a bill to create the 941,000 acre Mojave Trails National Monument to ratify this federal protection of what Gore called "some of the most pristine and scenic desert lands in the world."

For eighteen months, TWC's staff has been meeting with land owners, renewable energy firms, and power companies to quantify acreages available for renewable energy. During the inventory TWC staff contacted over 57 landowners and renewable energy firms that have solar and wind project proposals on private land. TWC staff also met with three water and utility agencies that have enough impacted lands available or proposed for solar development to reach California's 2020 goal of using 33% renewable energy.

1. In 2009, TWC hired a consulting firm to evaluate the solar potential of the Westlands Water District (WWD). WWD has 90,000 acres of farmland available for the placement of solar projects. In a meeting with Tom Birmingham, WWD's General Manager, TWC lent support for WWD's willingness to fallow land it bought from farmers for solar development to create improved water reliability for the remaining 500,000 acres in the water district. An additional 17,000 acres

in the WWD owned by farmers is proposed for solar development. WWD land is along existing transmission corridors from Los Angeles to Sacramento, next to Interstate 5 in California's Central Valley, which has substantial solar insulation.

2. Today at TWC's Oak Glen Preserve, the Los Angeles Department of Water and Power announced the formal abandonment of a power line proposal through two of TWC's preserves. LADWP will pursue its renewable energy goals on 32,000 acres of disturbed lands on Owens Dry Lake where the City has existing transmission corridors. April Sall, Conservation Director of TWC noted, "The Wildlands Conservancy has long supported solar on a portion of Owens Dry Lake which has a substantial restoration element. This project takes pressure off imperiled species that would be severely impacted by projects on pristine Bureau of Land Management lands."

3. Jesse Montaño, Assistant General Manager of the Imperial Irrigation District, said there are 4,000 megawatts of renewable energy projects in development within the District. The 3,000 megawatts of solar and 1,000 megawatts of geothermal represent one fifth of California's 2020 goal of 20,000 megawatts.

TWC inventoried over 15,000 acres of abandoned alfalfa farms in the Antelope Valley region available for solar. This includes the 4,600-acre Arciero Ranch that is under option for solar development to John Musick. Mr. Musick, representing Arciero Ranch, noted, "This is the future of solar in the West. We must repurpose these abandoned lands throughout America rather than destroy our public land treasures." The Arciero Ranch abuts the Beacon Solar LLC/NextEra Project on an adjacent 3,500 acres of abandoned alfalfa fields. [Mr. Musick can be reached at (970) 925-1900.] TWC has broadly supported these Antelope Valley projects on degraded lands and David Myers, Executive Director of TWC, was a guest speaker at the dedication of California's only utility scale power tower built by E-Solar in Lancaster.

Lorelei Oviatt, Kern County's Special Projects Division Chief, stated, "Clearly, there is enough impacted private land out there to take care of our renewable energy needs. Private land projects may look small when evaluated individually, but they add up. In Kern County there are 16 projects under application totaling over 20,000 acres and 2,200 megawatts." TWC is offering up to 30,000 acres of its Kern County habitat preserves as mitigation to help fast-track these renewable energy projects.

San Bernardino County Supervisor Neil Derry observed, "These private land projects benefit county property tax rolls and don't require taking hundreds of thousands of acres off the tax roll for mitigation because they substantially don't have endangered species issues. They create much needed jobs closer to population centers without the county having to expand infrastructure to remote locations. They're a win-win for the county."

During the inventory, TWC visited several of Edison Mission Energy's private land utility scale solar project sites that were recently sold to First Solar. TWC has broadly

backed the former Edison Mission Energy Projects that are primarily on disturbed agricultural lands and has offered First Solar its support for the former Edison projects. TWC salutes Edison International, Southern California's largest Public Utility, for their support for the Feinstein Desert Protection Act of 2010.

Thomas Dinwoodie, the Founder and Chief Technological Officer of Sun Power, one of the world's largest photovoltaic manufacturers, after meeting with TWC staff wrote: "I greatly admire your work. By pro-actively identifying the right lands for development, you will accelerate our needed push toward solar, and short-circuit potentially years of wasted time, effort and good will between the solar and environmental communities. Your work is a model for other states and countries, and has historic dimension."

Myers summarizes The Wildlands Conservancy's inventory: "Landscape preservation and solar development debate has been mischaracterized as green versus green. Now we have reduced that conflict to the broad-based environmental support for placing projects on disturbed lands versus the lack of support for placing projects on pristine public lands, especially those donated for permanent preservation." Thirteen mainstream environmental groups developed "Renewable Energy Siting Criteria" that support placing projects on disturbed lands (copy enclosed).

TWC uses solar on previously disturbed lands on its desert and central valley preserves and has broadly supported properly sited solar and wind projects. TWC became involved in renewable energy public policy to prevent lands it donated to the Department of the Interior for conservation from becoming industrialized. "It would be a tragedy if the 100-year American tradition of land gift philanthropy that has made Acadia, Grand Tetons and Redwoods National Parks what they are today, died in the desert sands" said Myers.

TWC believes more focus should be kept on distributed generation of roof top photovoltaic energy. A 2005 study commissioned by the California Energy Commission titled "**California Rooftop Photovoltaic (PV) Resource Assessment and Growth Potential by County**" showed that commercial and residential rooftops had the technical potential to generate 67,889 megawatts of electricity. Currently, California peaks around 65,000 megawatts on the hottest of summer days.

Thank you for your comment, Michael Painter.

The comment tracking number that has been assigned to your comment is SEDDsupp20165.

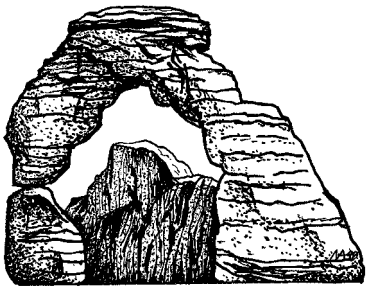
Comment Date: January 27, 2012 19:14:21PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20165

First Name: Michael
Middle Initial: J
Last Name: Painter
Organization: Californians for Western Wilderness
Address: P.O. Box 210474
Address 2:
Address 3:
City: San Francisco
State: CA
Zip: 941210474
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Solar_SDEIS_012712.pdf

Comment Submitted:

Californians for Western Wilderness

A project of Resource Renewal Institute



Coordinator
Michael J. Painter
(415) 752-3911

P.O. Box 210474
San Francisco
CA 94121-0474

e-mail:
info@caluwild.org

January 27, 2012

Ms. Shannon Stewart
Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue – EVS/240
Argonne, IL 60439

RE: Comments on Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

Dear Ms. Stewart:

I am writing on behalf of the more than 790 members and supporters of Californians for Western Wilderness (CalUWild), an unincorporated citizens organization dedicated to encouraging and facilitating citizen participation in legislative and administrative actions affecting wilderness and other public lands in the West. Our members use and enjoy the public lands in Utah and all over the West.

CalUWild wishes to support and endorse the California-specific comments submitted by The Wilderness Society, Natural Resources Defense Council, California Wilderness Coalition and other groups for the Solar Energy Development SDEIS. We specifically support the discussion of wilderness and areas that need to be exempted from consideration for development.

We do not endorse the newly-introduced concept of variances and disassociate ourselves from that portion of their comments, with this caveat: To the extent that the variance concept might be adopted, we support the recommendations made in those comments for exclusions of areas with wilderness character, and other environmentally sensitive areas.

We also support and endorse the comments submitted by The Wilderness Society, Natural Resources Defense Council, Western Environmental Law Center, Sierra Club, and other groups on the general aspects of the Solar Energy Development SDEIS. Again, we do not endorse the variance concept, but as above, to the extent that the variance concept is adopted, we support the recommendations for clarification contained in those comments.

Having said these things, we also wish to re-state our conviction that the federal government and BLM are approaching the topic of renewable energy in the wrong order. The government should be embarking on a concerted effort to develop energy conservation and demand reduction programs. The cheapest kilowatt is the one not used. Secondly, the government should be encouraging the development of rooftop solar and other local, close-to-the-end-use-point technologies. The less distance power needs to be transmitted from source to use the cheaper and the less lost to inefficiencies. Only after these two factors are considered should large-scale industrial facilities be planned. And even then, our public lands—especially untouched lands in the desert—should be the last resort.

The original DEIS and this Supplement should use this hierarchy as its starting point for analyzing and developing strategies for solar power in this country.

Too many people think of deserts as wastelands, but this attitude needs to change. They are unique ecosystems with their own huge variety of life systems. The fact that there is not a large amount of human habitation and other development should not turn them into energy sacrifice zones.

Thank you for the opportunity to comment. Please inform us of your decision in this matter and please also inform us of further opportunities to be involved in your public decision-making processes.

Sincerely,

Michael J. Painter
Coordinator

Thank you for your comment, Kevin Kingma.

The comment tracking number that has been assigned to your comment is SEDDsupp20166.

Comment Date: January 27, 2012 19:29:10PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20166

First Name: Kevin
Middle Initial: E
Last Name: Kingma
Organization:
Address: 2367 Alva Ave.
Address 2:
Address 3:
City: El Cerrito
State:
Zip:
Country:
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

To be brief, please redo the PEIS. The current PEIS fails to consider/offer the option of distributed generation (roof top solar). It also fails to consider many sites identified by the EPA as disturbed land that is suitable for alternative energy projects. NEPA requires that all options be considered. The fast track process short cuts normal environmental review procedures to the degree that it no longer allows for environmental protection of desert public lands. I doubt the legality of the Secretary of the Interior's fast track approval of large scale projects on undisturbed desert lands despite public disapproval, using the statement that overiding national interest takes precedence. I do not think the SOI has the authority to make that decision.

I fully understand carbon caused global climate change and support alternative energy. If you need to learn how to accomplish a successful, legal, efficient implementation of alternative energy -- just copy what has been done in a country like Germany.

This process has been wrong from the start, with no limits placed on the location of alternative energy projects. The PEIS does very little to fix this.

Thank you for your comment, Debra Thompson.

The comment tracking number that has been assigned to your comment is SEDDsupp20167.

Comment Date: January 27, 2012 19:29:43PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20167

First Name: Debra
Middle Initial: L
Last Name: Thompson
Organization:
Address: 7665 Palomar Avenue
Address 2:
Address 3:
City: Yucca Valley
State: CA
Zip: 92284
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

I am writing to request that the deadline for submitting comments be extended six months. The comment period must be extended due to the significant revisions made. To maintain the current deadline would defeat the democratic process, show malicious intent on the part of the Solar Development Program and undue influence from big business. (Fancy way of saying government corruption) Meaningful public review of this 500+ page document will require at least an additional three preferably six additional months.

Thank you for your comment, Jamie Hall.

The comment tracking number that has been assigned to your comment is SEDDsupp20168.

Comment Date: January 27, 2012 19:37:03PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20168

First Name: Jamie
Middle Initial: A
Last Name: Hall
Organization: The California Desert Coalition
Address: P.O. Box 1508
Address 2:
Address 3:
City: Yucca Valley
State: CA
Zip: 92286
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: SolarPEISsuppdraftcommentsCDC_Final.docx

Comment Submitted:

California Desert Coalition

P. O. Box 1508

Yucca Valley, CA 92286

www.cadesertco.org

January 27th, 2012

Draft Solar Energy Programmatic EIS
Argonne National Laboratory
9700 S. Cass Avenue - EVS/240
Argonne, IL 60439

RE: Comments on the Supplement to the Draft Solar Energy Programmatic EIS *(hard copy mailed to above address and electronic version submitted to online website)*

Dear BLM and DOE:

The California Desert Coalition (CDC) provided scoping comments for the Solar Energy Development Programmatic EIS in September 2009 and also in April of 2011 and is pleased to provide comments on the Supplement to the Draft Solar Energy Programmatic EIS.

CDC is a citizens' advocacy group formed in 2007 to oppose the Los Angeles Department of Water & Power's (LADWP's) preferred alignment for its Green Path North transmission line project. Although the LADWP withdrew from Bureau of Land Management (BLM) its application for the Green Path North transmission line, CDC on behalf of the public continues to participate in the monitoring of renewable energy development in the California desert.

The members of the California Desert Coalition write to you in opposition to the BLM's preferred alternative (modified solar energy development program alternative), as outlined in the supplement document to the Draft Solar Energy PEIS. Under this alternative, a 'variance process' of designating lands outside the Solar Energy Zones (SEZ's) to potentially accommodate additional utility-scale solar development is proposed. We completely oppose the proposed variance process, as it would open up a vast amount of additional acres of public land for project-by-project development, which we believe to be unnecessary for several reasons:

- The variance process is unplanned and unmanaged. It is industry driven (projects would proceed in a piecemeal fashion throughout the desert) whereas development inside the SEZ's is agency-driven.
- Development is likely to occur on these sensitive, pristine 'variance' lands, rich in natural resources. These lands have had little to no environmental review.
- The proposal to identify additional SEZ's either by the BLM or the statewide effort's Desert Renewable Energy Conservation Plan (DRECP), will withdraw the need for variance lands (i.e. West Mojave, Chocolate Mountains and Imperial Valley).
- Lands purchased with private monies and donated to the federal government for conservation (i.e. former Catellus lands) need to be fully excluded from the variance process. As it stands currently, they are mapped as lands within the proposed variance zones.
- There are several wildlife corridors that exist in areas where variance is proposed. For instance there is a known bighorn sheep corridor between the Old Woman Mountains, Cadiz Dunes, and

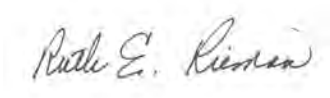
Sheephole Mountains Wilderness that will be fragmented and disrupted should lands become developed here. The act of designating variance lands (not only here, but throughout the California Desert) jeopardizes the investment the BLM has made in further identifying the need for such wildlife corridors (i.e. Epps, C.W., J.D. Wehausen, V.C. Bleich, S.G. Torres, and J.S. Brashares. 2007. Optimizing dispersal and corridor models using landscape genetics. Journal of Applied Ecology 44:714-724. (Epps et al. 2007).

Another element of the supplement that we wish to see improved and further managed is the management of visual resources. Currently in the supplement, lands with visual resources are categorized into classes (VRM Class I and II) and are stated to be excluded from solar energy development, but are still mapped in both the SEZ's (i.e. Riverside East) and proposed variance zones. They need to be fully excluded from the PEIS (i.e. they should not be developed) and further managed. Until then, the PEIS should follow the rules and regulations that are currently in place.

We strongly urge you to reconsider the adoption of the variance process (BLM's Modified Solar Energy Program Alternative) and continue with study of the existing and proposed SEZ's (Modified SEZ alternative) to develop renewable energy in a responsible manner on our public lands.

Finally, we commend the work and coordination between the BLM and statewide planning effort on the DRECP, and support continued collaboration.

Sincerely,



Ruth Rieman, Vice Chair of the California Desert Coalition

Thank you for your comment, Greg Suba.

The comment tracking number that has been assigned to your comment is SEDDsupp20169.

Comment Date: January 27, 2012 19:49:08PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20169

First Name: Greg
Middle Initial:
Last Name: Suba
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Privacy Preference: Don't withhold name or address from public record
Attachment: CNPS_SEIScomments_012712.pdf

Comment Submitted:

CALIFORNIA
NATIVE PLANT SOCIETY

January 27, 2012

Shannon Stewart
Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue – EVS/240
Argonne, IL 60439
Submitted via Email

RE: Comments on Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

Dear Ms. Stewart,

The California Native Plant Society (CNPS) submits the following comments and recommendations regarding the U.S. Bureau of Land Management's (the BLM's) Supplement to the Draft Solar Programmatic Environmental Impact Statement (SEIS) document. These comments are in addition to the comments we provided on May 2, 2011 for the original Draft Solar Programmatic EIS. We incorporate those additional comments herein by reference.

CNPS is a non-profit organization working to protect California's native plant heritage and preserve it for future generations. Our nearly 10,000 members are professionals and volunteers who work to promote native plant conservation through 33 chapters statewide.

CNPS supports renewable energy generation via large-array utility scale projects only when sited on already-disturbed lands, e.g., brownfields and fallow, mechanically disturbed agricultural lands. We oppose the siting of large-array renewable energy projects sited in functionally intact areas on public trust lands, both in the desert and elsewhere.

The Solar PEIS will govern solar development on public lands for at least 20 years. Therefore, development of large-scale projects must be sited on places with the fewest impacts on intact plant and animal habitats, natural resources, and endangered species, and we are encouraged that modifications and additions to the Solar PEIS that the BLM has made during the Supplemental phase will help minimize such impacts.

I. CNPS supports the Modified SEZ Program Alternative and opposes the variance process included in the Modified Development Program Alternative

The SEIS Modified SEZ Program Alternative will identify sufficient acres of public lands needed to meet our solar energy portfolio targets, especially when the number and location of these acres are considered within the context of additional solar energy development areas to be identified through the Desert Renewable Energy Conservation Plan (DRECP) process in

California, the ability to establish new, additional SEZs through the SEIS, and the contributions of distributed energy generation (DG) to federal and state energy portfolios. CNPS supports and strongly recommends the BLM to adopt the Modified SEZ Program Alternative under the solar SEIS.

The BLM's current preferred alternative, the Modified Development Program Alternative, designates Solar Energy Zones (SEZs), while including an additional variance process outlined in the Supplement. The variance process is a new addition to the solar program that CNPS neither recommended nor supported in our comments on the Draft PEIS. CNPS does not support the addition of this new process as part of the Supplement to the Draft PEIS. We do not agree with the BLM's rationale for including the variance option, provided in the SEIS, as explained below.

• *In order to accommodate the flexibility described in the BLM's program objectives, the modified program alternative allows for responsible utility-scale solar development outside of SEZs.* (p. 2-33, lines 3-5)
The guidelines for developing additional SEZ's outlined in the SEIS provide the flexibility described in the BLM's program objectives, and no additional flexibility (variance option) is necessary or beneficial to public land protection under this program.

• *The variance process provides an opportunity for developers to propose applications outside of identified SEZs and complements the directed development approach in the modified program alternative.* (SEIS p. 2-33, lines 28-30)
To the contrary, the variance process *undermines* the directed development approach in the modified program alternative. The directed development approach seeks to concentrate solar development in areas identified as low-impact and facilitate the planning and development of appurtenant transmission to and from those areas. The variance process would provide a means to continue the current scattershot approach to siting on public lands, and potentially produce growth-inducing, "leap-frog" projects requiring transmission and generation-tie lines in ecologically inappropriate areas.

• *Variances may be needed in the near-term because the lands identified as SEZs might be insufficient to accommodate demand for utility-scale solar development.* (SEIS p. 2-33, lines 30-31)
This is precisely why the SEIS includes extensive guidelines for development of *new, additional* SEZs, which are to be 5,000 acres or greater, and reviewed on a 5-year cycle. The acreage represented by the SEZ's outlined in the SEIS, in addition to the development focus areas to be assigned through the DRECP process will provide enough developable acreage for utility-scale solar. Any additional siting acreage on public lands exceeds BLM's own analysis of what is truly needed and cannot be justified under the Reasonably Foreseeable Development Scenario.

Opening this additional acreage won't create a significant change from the current scattered, fast-tracked siting approach. CNPS strongly feels that this approach will involve higher resource conflicts, more public opposition, continued uncertainty both for wildlife managers and developers, and more litigation.

There should be *no* projects developed outside these zones and if the need should arise, the Modified SEZ Program Alternative already allows for designating additional zones in areas identified as degraded and with lower impacts in the future. CNPS strongly urges BLM to choose the Modified SEZ Program Alternative, which would provide a program for developing solar energy while still protecting our public lands.

• *In addition, there might be market, technological, or site-specific factors that make a project appropriate in a non-SEZ area.* (SEIS p. 2-33, lines 31-33)
Market and technological factors that "might" exist in future years will pertain also to distributed generation (DG) markets and technologies which, for myriad reasons, provide a more secure, environmentally friendly, and socially equitable solar energy generation paradigm than the current focus on utility-scale generation and associated transmission requirements. The ability for distributed energy generation to meet our energy goals must be considered under the Reasonably Foreseeable Development Scenario, and DG's contributions to future energy portfolios represent conditions that must far-outweigh proposals to site utility-scale facilities on additional public lands beyond those identified in SEZs.

II. The BLM must prioritize CA SEZ areas for additional data/analysis collection (via Action Plans)

The BLM notes (SEIS p. 2-41) that it will "prioritize the collection of additional data and analysis (listed in the Action Plans in Appendix C of the SEIS) in those SEZs that are most likely to be developed in the near future." Along with others in the conservation community, we request that the BLM prioritize the Riverside East SEZ for such action. As the agency is well aware, there are additional projects presently being considered in this SEZ (see Appendix A of the SEIS). The timely completion of additional analysis for this SEZ will facilitate development in the locations that are best suited for such intensive use in the fragile desert.

We also believe that an initial regional mitigation plan should be developed for the Riverside East SEZ and presented in the Final PEIS. Due to the number of SEZ-specific issues that need to be mitigated, early development of a regional mitigation plan for the Riverside East SEZ will ensure that projects are processed in a timely manner.

III. The BLM must revise pending CA Project applications

CNPS has reviewed the projects for California that are listed in Appendix A of the SEIS. We believe the list for California needs to be revised.

Specifically, we question why Broadwell Lake is still on BLM's list of first in line projects. The proposed project is within the proposed Mojave Trails National Monument, which is a proposed exclusion area. We believe this project should be rejected by BLM and removed from the list.

We also believe that the BLM should not approve projects in the California desert that are inconsistent with the developing conservation strategy within the DRECP planning area.

IV. The Final PEIS must include a complete Cumulative Impacts Analysis

We are very concerned that there has been no further analysis of cumulative impacts in the SEIS for past, present and reasonably foreseeable development within the Riverside East and Imperial East SEZs. The BLM intends to defer these analyses to the Final PEIS and we expect to see a complete analysis of cumulative impacts in the Final PEIS. We append to this letter the botanical information related to the Riverside East and Imperial East SEZs which we provided in our May 2011 comment letter, in hopes it can assist the BLM with the cumulative impacts analysis (note: rare plant occurrences recorded in the California Natural Diversity Database (CNDDB) are updated monthly. We will gladly provide up-to-date lists upon request).

V. Adaptive Management & Monitoring Plans in the Final PEIS will require NEPA analysis

Because the adaptive management and monitoring plans will not be prepared until the Final PEIS, additional NEPA analysis in that document will be required to evaluate their effect on expected impacts. Additionally, changes to design features and additional analysis of SEZs, including natural and cultural resources, visual impacts, water use and transmission, are also deferred to the Final PEIS. Consequently, the agency will need to provide an opportunity for meaningful public comment on this analysis and respond to such comments in order to comply with NEPA.

The California Native Plant Society appreciates the opportunity to provide these comments regarding the Supplemental to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States. We will continue to provide information that can help the BLM develop the best possible environmental assessment in a timely manner. We share a common goal to provide effective, long-term protective policies for the preservation of biological resources in the California Desert, while addressing the permitting process for renewable energy projects.

Sincerely,

Greg Suba

Greg Suba
Conservation Program Director
California Native Plant Society

ATTACHMENT A

California SEZ-specific comments - (This information was originally provided in our comment letter on the Draft PEIS, dated May 2, 2011.)

Based on botanical information from recent reconnaissance level surveys, we provide the following descriptions of plant communities and our related concerns regarding California SEZs. We also provide a list of special-status plants and plant communities found in the proposed CA SEZs and surrounding areas.

Imperial East SEZ

Description of SEZ vegetation
The majority of the habitat along Hwy 8 is stabilized desert dunes of *Larrea tridentata* (creosote). The area is marked by large plants with hummocks of sand accumulated around the shrubs (coppice dunes), punctuated by scattered, and very large coppice dunes of *Prosopis glandulosa* (mesquite) over 3 meters high, with many animal burrows visible.

The site occurs in a topographic low where very few washes are present. The occurrences of mesquite are a good indication of groundwater dependent vegetation. Groundwater pumping even for a dry-cooled facility could have significant negative affects to GDE communities within and around this SEZ. The potential impacts of groundwater pumping to GDE communities needs to be addressed in the Cumulative Impacts analysis for this SEZ.

The creosote was tall and vigorous in the western half of the SEZ but looked relatively distressed in the eastern half. The reason(s) for this was not obvious. These eastern creosote stands did not exhibit the depauperate, drought-stressed characteristics sometimes seen in stands deprived of surface flow by canals, dikes, and highways. The plants were predominantly senescent, and over 75% dead in many eastern areas of the SEZ, and in the East Mesa BLM ACEC to the north.

In the eastern and southern portion of the SEZ, especially in the relatively more disturbed areas between Hwy 98 and the canal, the creosote is co-dominated by *Ericameria linearifolia*, with associated *Ambrosia dumosa,* and *Atriplex polycarpa*.

Farther to the west along Hwy 98, the vegetation is dominated by an association of creosote and *Ephedra californica* (ephedra) for several miles. *Ericameria linearifolia* (narrow leafed goldenbush), *Ambrosia dumosa* (white bursage, burrowbush), and *Atriplex polycarpa* (allscale) are also present but the stands were defined predominantly by creosote and ephedra. These observed stands of creosote, ephedra, and narrow leafed goldenbush may be new vegetation associations not currently documented based on available vegetation data (NECO vegetation mapping did not collect data as far south as this SEZ area), and underscore the need for vegetation surveys in this area.

Near the western boundary of the SEZ along Hwy 98, what at first would appear to be canal leaks of tamarisk on aerial photos are actually vast stands of mesquite and *Pluchea sericea*

(arrow weed), which occur mostly in separate stands. The BLM Lake Cahuilla ACEC to the west of the Imperial East SEZ, is occupied largely by the mesquite and *Pluchea* communities. The majority of the mesquite is just off-site of the Imperial East SEZ, however it is important to note these occurrences because even dry-cooled solar projects can use a large volume of water during their construction phase. If projects were to rely on groundwater to supplement irrigation water, or as their sole source of water, their impacts to groundwater dependent vegetation could be significant. The zone of influence of groundwater pumping can extend 1 to 2 miles out from the wells and the cumulative effect on nearby groundwater dependent plant communities would most likely be significant.

The Imperial East SEZ vegetation is underlain by fine to medium sand. The location and soil type are definitely potential conditions for *Astragalus magdalenae peirsonii* (Peirson's milkvetch), *Croton wigginsii* (Wiggins' croton), and other dunes rare plant species, as well as an indication of flat-tailed horned lizard habitat.

There is also potential for a number of rare invertebrate species to occur, including the Riverside cuckoo wasp (from the Wiley's Well area), recently discovered at the Algodones Dunes.

Riverside East SEZ

We believe the area of the Riverside East SEZ should be reduced to avoid impacts to rare plants and other sensitive resources. In early February, 2011, CNPS Vegetation Program staff conducted a field-based workshop around Palen Lake near Desert Center to identify, survey, and map rare vegetation in this area of the Riverside East SEZ.

Palen Lake is an alkali playa surrounded by series of active, semi-stabilized, and stabilized dunes and areas of desert pavement. It includes a myriad of vegetation patterns including creosote shrublands, mesquite bosques, desert wash woodlands, saltbush scrubs, and groundwater-dependent sink scrubs in addition to the dune and desert pavement habitats.

During the workshop, participants sampled 15 vegetation stands and made several additional observation points. Rare communities documented included *Parkinsonia florida* (blue palo verde), *Olneya tesota* (ironwood), *Propopis glandulosa* (mesquite), and *Psorothamnus spinosus* (smoke tree) woodland alliances; and *Suaeda moquinii* shrubland (bush seepweed) alliance.

As with the other proposed California SEZs, assessing impacts to groundwater dependent communities within the Riverside East SEZ, particularly around dry lakes and playas, will be essential in order to conserve important natural communities.

Rare Plants, Sensitive Plant Species, Plant Species of Concern, and Vegetation Types in Proposed California SEZs

I. Plant Species - List of Rare Plants known to occur within and around the BLM Solar Energy Zones (SEZ) in Califiornia. These lists were derived from a search of the California Natural Diversity Database (CNDDB), February 2011.

Riverside East SEZ

Scientific Name	Common name	*State*	*Fed*	*G-rank*	*S-rank*	CRPR
Astragalus insularis var. harwoodii	Harwood's milk-vetch	-	-	G5T3	S2.2?	2.2
Castela emoryi	Emory's crucifixion-thorn	-	-	G2G3	S2S3	2.3
Colubrina californica	Las Animas colubrine	-	-	G4	S2S3.3	2.3
Coryphantha alversonii	Alverson's foxtail cactus	-	-	G3	S3.2	4.3
Ditaxis serrata var. californica	California ditaxis	-	-	G5T2T3	S2	3.2
Eriastrum harwoodii	Harwood's eriastrum	-	-	G2	S2	1B.2
Koeberlinia spinosa ssp. tenuispina	Slender-spined all-thorn	-	-	G4T4	S2.2	2.2
Mentzelia puberula	Darlington's blazing star	-	-	G4	S2	2.2
Wislizenia refracta ssp. palmeri	Palmer's jackass clover	-	-	G5T2T4	S2?	2.2

Imperial East SEZ
Plants known to occur within 10 kilometers of the SEZ

Scientific Name	Common name	*State*	*Fed*	*G-rank*	*S-rank*	CRPR
Croton wigginsii	Wiggin's croton	Rare	-	G2G3	S1.2	2.2
Palafoxia arida var. gigantean	Giant Spanish-needle	-	-	G5T3	S2	1B.3
Pholisma sonorae	Sand food			G2	S2	1B.2

Status Codes:

Federal: FE - Federally listed endangered: species in danger of extinction throughout a significant portion of its range
FT - Federally listed, threatened: species likely to become endangered within the foreseeable future
BCC: Fish and Wildlife Service: Birds of Conservation Concern: Identifies migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent highest conservation priorities <www.fws.gov/migratorybirds/reports/BCC2002.pdf>

State CSC = California Species of Special Concern. Species of concern to CDFG because of declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction.
SE - State listed as endangered
ST = State listed as threatened
WL = State watch list

State Rank (S-Rank):
S1—Less than 6 EO, or less than 1,000 individuals, or less than 2,000 acres;
S2—Same as "G2";
S3—Same as "G3".

State Rank Extension:
0.2—threatened;
0.3—no current threats known

Global Rank (G-Rank) is a reflection of the overall condition of an element throughout its global range:
G2—Same as "S2";
G3—Same as "S3";

G4—Apparently secure, this rank is clearly lower than G3, but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat;
G5—Population or stand demonstrably secure to ineradicable due to being commonly found in the world.
Subspecies receive a T-rank attached to the G-rank. The G-rank refers to the whole species range, but the T-rank refers to the global condition of taxon variety only.

California Rare Plant Rank (CRPR)

1B - Rare, threatened, or endangered in California and elsewhere
2 - Rare, threatened, or endangered in California but more common elsewhere
3 - Plants which need more information - a watch list
4 - Limited distribution – a watch list
0.1 - Seriously threatened in California (high degree/immediacy of threat)
0.2 - Fairly threatened in California (moderate degree/immediacy of threat)
0.3 - Not very threatened in California (low degree/immediacy of threats or no current threats known)

II. Alliances – Draft List of Vegetation Types Known or Likely to Occur in the **Imperial East SEZ and Environs**
California Native Plant Society, February 2011

The alliances and associated listed below include those known to occur within the BLM Solar Energy Zone (SEZ) and those known to occur within 10 kilometers of the SEZs (and therefore have potential to be present in the SEZ. The list for Imperial East was derived from observation in late 2010; thus, additional information could be acquired for this location.
***** = Considered as Statewide Rare or of High Priority for Inventory (with State Rarity ranking of S3 or below). Also, see the DFG natural communities list, which addresses high ranking of vegetation types.

Imperial East SEZ

Tree Dominated:

Prosopis glandulosa* Shrubland Alliance
*Prosopis glandulosa / Pluchea sericea – Atriplex canescens**

Shrub Dominated:

***Ambrosia dumosa* Shrubland Alliance**
Ambrosia dumosa – Ericameria linearifolia (provisional type based on observation)

***Larrea tridentata* Shrubland Alliance**
Larrea tridentata
Larrea tridentata – Ericameria linearifolia (provisional type based on observation)

***Larrea tridentata-Ambrosia dumosa* Shrubland Alliance**
Larrea tridentata – Ambrosia dumosa
Larrea tridentata-Ambrosia dumosa-Ephedra (*californica*)*
*Larrea tridentata – Ambrosia dumosa / Pleuraphis rigida**

Pluchea sericea* Shrubland Alliance

Alliances & Associations – Draft List of Known or Likely to Occur Vegetation Types in the **East Riverside SEZ and Environs**
CNPS, February 2011

This list was derived largely from data collected in preparation of the Northern & Eastern Colorado Desert Coordinated Management Plan (see NECO classification report by Evens and Hartman 2007), and from additional data collected in 2011 during a CNPS vegetation mapping workshop at Palen Lake. Because the vegetation communities throughout the entire East Riverside Solar Energy Zone (SEZ) are not yet mapped, the alliances and associated listed below include those known to occur within the SEZ and those that occur within 10 kilometers of the SEZ (and therefore have potential to be present in the SEZ).
***** = Considered as Statewide Rare or of High Priority for Inventory (with State Rarity ranking of S3 or below). Also, see the DFG natural communities list, which addresses high ranking of vegetation types.

East Riverside SEZ

Tree Dominated Types:

Parkinsonia florida – Olneya tesota* Woodland Alliance

*Parkinsonia florida / Larrea tridentata – Peucephyllum schottii**

*Parkinsonia florida - Olneya tesota**

Parkinsonia florida / (*Psorothamnus emoryi, Pleuraphis rigida*) (provisional dune type)*

*Parkinsonia florida - Olneya tesota / Hyptis emoryi**

*Parkinsonia florida**

*Parkinsonia florida / Hyptis emoryi**

*Olneya tesota**

*Olneya tesota / Psorothamnus schottii**

Prosopis glandulosa* Woodland Alliance

Prosopis glandulosa – Atriplex spp.*

Psorothamnus spinosus* Woodland Alliance

Psorothamnus spinosus / Ephedra (*californica*) *- Ambrosia salsola*

Shrub Dominated Types:

Allenrolfea occidentalis* Shrubland Alliance

*Allenrolfea occidentalis**

*Allenrolfea occidentalis - Suaeda moquinii**

***Ambrosia dumosa* Shrubland Alliance**

*Ambrosia dumosa – Ephedra californica**

*Ambrosia dumosa / Pleuraphis rigida**

***Atriplex canescens* Shrubland Alliance**

Atriplex canescens

***Atriplex polycarpa* Shrubland Alliance**

Atriplex polycarpa Sparse Playa

***Atriplex spinifera* Shrubland Alliance ***

*Atriplex spinifera**

***Encelia farinosa* Shrubland Alliance**

Encelia farinosa

***Larrea tridentata* Shrubland Alliance**

Larrea tridentata

Larrea tridentata – Atriplex polycarpa

Larrea tridentata / Cryptogamic crust

*Larrea tridentata / Pleuraphis rigida**

***Larrea tridentata – Ambrosia dumosa* Shrubland Alliance**

Larrea tridentata – Ambrosia dumosa

Larrea tridentata – Ambrosia dumosa – Krameria grayi

*Larrea tridentata – Ambrosia dumosa – Fouquieria splendens**

*Larrea tridentata – Ambrosia dumosa – Olneya tesota**

*Larrea tridentata – Ambrosia dumosa – Psorothamnus spinosus**

Larrea tridentata – Ambrosia dumosa / Cryptogramic crust

Larrea tridentata – Encelia farinosa Shrubland Alliance

Larrea tridentata – Encelia farinosa

Larrea tridentata – Encelia farinosa – Ambrosia dumosa

Pluchea sericea Shrubland Alliance*

*Pluchea sericea**

Suaeda moquinii Shrubland Alliance*

*Suaeda moquinii**

*Suaeda moquinii – Atriplex canescens**

Herbaceous Types:

***Brassica* (*tournefortii*) Herbaceous Semi-Natural Stands**

Brassica tournefortii / Ambrosia dumosa

***Pleuraphis rigida* Herbaceous Alliance ***

Pleuraphis rigida (in desert washes and on dunes)*

*Pleuraphis rigida / Ephedra (californica)**

Dicoria canescens – Abronia villosa* Herbaceous Alliance

*Dicoria canescens**

Salsola tragus - Oenothera deltoides (provisional dune type based on observation)*

Petalonyx thurberi* Provisional Herbaceous Stands

(provisional sandy type based on observation in area and recent data collection on NPS lands)

Wislizenia refracta Herbaceous Special Stands*

Miscellaneous Land Use Types:

Simmondsia chinensis plantations and other agricultural field

Thank you for your comment, Carlos Garcia.

The comment tracking number that has been assigned to your comment is SEDDsupp20170.

Comment Date: January 27, 2012 19:57:04PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20170

First Name: Carlos
Middle Initial:
Last Name: Garcia
Organization:
Address: [Withheld by requestor]
Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold address from public record
Attachment: Final_comments_submitted_on_1_27_2012[1].doc

Comment Submitted:

Attn: Linda Resseguie
Argonne National Laboratory
9700 S. Cass Avenue
EVS/240
Argonne, IL 60439

RE: Public Comment for the Supplement to the Draft Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States

January 27, 2012

Dear Ms. Linda Resseguie:

I am a permittee of the Alta Lake Permit on the proposed Antonito Southeast Solar Development site and I strongly oppose the designation of this permit for the following reasons:

1. I depend and use the permit every time my grazing periods become available for the historical use of grazing cattle on this land. This is my way of life, and if my grazing rights are cancelled without any monetary compensation or another comparable grazing allotment in close proximity, the impact to my cattle business would be significant to the extent that I would have to downsize the herd or sell out completely. I do not believe it is the intention to force cattle producers out of the business when planning for solar development on Bureau of Land Management (BLM) /federal owned lands. I have a hard time even thinking of the difficult process I would have to go through to purchase private land or be forced to purchase another grazing allotment, and the near impossible feat to secure another permit in neighboring northern New Mexico BLM or a USDA permit for Carson National Forest as those permits are also passed down within families from generation to generation as they are in the San Luis Valley. The burden of crossing state lines with cattle is extremely expensive due to the testing, trucking fees, rider costs, and other incidentals, plus additional time that is currently necessary in other parts of the business. My current plans are to will my private owned base land attached to this permit, my grazing permits and cattle to my daughters, their husbands, and my grandson. They plan to continue the family cattle business operations.
The legality and reality of what I mention in #1 needs to be discussed at length before this proposed zone is further considered.

2. I believe there are cultural and historical pasts that must be considered. The ranchers and farmers of the San Luis Valley have always contributed greatly to the livestock, hay, potato, grain and other agricultural products that are necessary in order to help feed the USA and other countries. "Conejos County has enormous natural history values including being part of the Sangre de Cristo NHA, and long human use. The mission of the NHA is to promote, preserve, protect and interpret the profound historical, religious, environmental, geographic, geologic, cultural and linguistic resources. These efforts will contribute to the overall national story and engender a spirit of pride and self-reliance, and create a legacy in the Colorado counties of Alamosa, Conejos, and Costilla. Hispanic settlers from the south were enticed to raise crops and sheep through land grants under Mexican communal law, a practice that was adopted under Spanish reign and continued when Mexico won its independence from Spain, to settle the region that is presently encompassed by the NHA. When the Mexican-American war ended in 1848 and the territory was ceded to the United States with the signing of the Treaty of Guadalupe Hildalgo the Conejos Land Grant (which includes present day Conejos County, Rio Grande County and portions of Alamosa County and Saguache County) was the only land grant that was petitioned for a patent and denied in its entirety."1 1. McCourt, "*The Conejos Land Grant Southern Colorado"*, Colorado Magazine, Vol. 52 (1975): 36-51.

3. The impact to the active prairie dog colonies, which are abundant throughout the permit. My observations lead me to believe the prairie dog population has been on the increase over the past 10 or more years.
4. The impact to the antelope herds that depend on grazing this permit. I believe this permit and the adjacent permit also being proposed are the closest federal owned land to water and by developing this land it would cause hardships for the antelope to find water and pasture.
5. The ecological and environmental impacts to the development of this land. Heavy machinery would have to be brought in and the soils, forage, and lava rock would be significantly disturbed. This land is very rocky and not level by any means.
6. The costs and impacts to develop transmission lines will be significant. I believe private land owners will be impacted in order to adequately develop an infrastructure. I also believe private land owners have not been considered in the planning stages. The proposed transmission corridor between southeast Antonito and sending it out of the San Luis Valley spans a large area, approximately 45 miles. Additionally, private and public land

owners have not received ample communication and notification of this proposal and implications associated with this proposal.
7. I believe there are private land owners closer to Antonito and other communities in the San Luis Valley that are willing to sell their land for this type of development. There are parcels of private land closer to substations and transmission lines that will not impact so many private and public land owners.
8. I believe the purpose of federal owned lands, such as the proposed, were designated for a reason and it is an injustice to cancel the designation, especially when it is still in use. Are solar seeking private owned businesses lobbying members of Congress and state legislatures to designate these lands in order to lessen their initial costs of purchasing private land and other costs?
9. After listening to President Obama's State of the Union speech last night, I believe he is not aware of the significant impact the re-designation and canceling of grazing rights will have to cattle operations such as my own. He talks about increasing renewable energy, but ultimately we know he does not intend to impact one's way of life. My previous comments posted on or about May 2, 2011 and this posting must be conveyed to him for his reading.

Finally, I do not believe a realistic and thorough evaluation of this proposed land was ever conducted. The land is vast and studies that encompass all impacts must be done correctly. I strongly recommend removing The Alta Lake Allotment land from the proposed Antonito Southeast Solar Enterprise Zone.

Carlos Garcia
BLM Alta Lake Permittee

Attached is a copy of the comments I submitted online on or about May 2, 2011.

I am strongly opposed to the proposed Antonito Southeast solar zone, state of Colorado. I have lived in the Antonito community all of my life, self-employed as a farmer and cattle rancher. My family is the current permittee of the BLM Alta Lake Grazing Permit. I was unaware that our permit was being considered for solar development until Saturday, April 30, 2011. To

my knowledge, as a permittee, I have never received written correspondence from BLM regarding this proposition. I recently grazed the permit in the fall of 2010 and I am currently planning of grazing the permit during the months of May and June, 2011, anxiously waiting BLM approval for a start date of at least May 5, 2011.

Sheep and cattle ranching has been a part of my family for a confirmed four generations. Factually, my grandfather and my father were proud owners of the Alta Lake Grazing Permit and I inherited it, along with my two brothers, upon the passing of our mother and father. My father and grandfather originally used the permit to pasture a flock of approximately 1,000 sheep. My father, in the early 1970's converted the permit to a 200 herd of cattle permit. Since then, the permit was annually grazed in the fall by his cattle and my cattle. Since I became a permittee, I have needed this permit in order to successfully remain in the cattle business. Records will show that I have used this permit every time the grazing periods become available. If this zone is approved, the impact to my family and I is significant. I will be forced to sell my cattle herd and look for employment elsewhere.

If approved, the impact to the antelope herd will also be significant. My observations lead me to conclude antelope depend on the grazing in the Alta Lake Permit during certain times of the year. Historically, this permit and the land proposed has the capacity to adequately feed the antelope during their migration cycles and provide ample pasture grasses and sage for sheep and cattle grazing. There is no water for the antelope in the permit, requiring the antelope to migrate daily to the San Antonio River, which is approximately 1.5 miles from the north boundary fence of the permit. My point is this permit is the closest BLM land to the San Antonio River, which makes the permit ideal for the preservation of antelope and other wildlife in the area. The impact would be significant to the herd if they were no longer able to graze the land.

Further, my understanding is the water that once was channeled through the permit has been abandoned and/or sold, and there are no plans or rights of ownership to plan on having access to water for development of any kind. Currently, I haul water for my cattle to drink to parts of the permit and centered in the middle of the permit is a 300 foot well that is designated for livestock drinking water only. My understanding at the time the well was drilled in the 1980's is water could not be found any higher than 300 feet down and the pump flow is poor, as we have to run a generator for a minimum of 3-5 hours a day to adequately water the cattle. Therefore, I believe water is one major reason to deny approval of this zone for solar development.

Transmission of solar energy produced is a major disadvantage, due to the lack of proximity to the nearest substation, which is south of the Town of Antonito. The cost would be significant to develop transmission lines to move the electricity produced. Transmission lines would have to be developed under/and or above the San Antonio River to hook onto the Town of Antonito substation, which is an environmental impact. Who would bear the cost? How fair would it be to ranchers, such as myself, for the government to subsidize large companies for this type of development and all these years, to not subsidize my operation in relation to surface water rights for my cattle to drink, providing me with electrical power to pump water for my cattle, and/or other forms of subsidy that would assist me in reducing my operating costs? When one considers the east most part of the proposed Antonito Southeast Zone, it is highly impractical, not feasible, not cost efficient to consider the majority of the land proposed and my fear is who would bear the developmental costs for what could become a private ownership profit. I do not see it being fair to make government subsidy funds available for infrastructure costs that are essentially funded by the taxpayer?

Another area of concern is the environmental and ecosystem impact on the proposed area. The composition of the surface land is predominately volcanic rock and soils. This land by all accounts is not flat land; there are not large sections that meet the description of uniformity. The land would have to be bulldozed; volcanic rocks would have to be stockpiled and/or hauled away, which means the land would have to be significantly impacted during the construction process. Rabbits, rattlesnakes, other snakes, gophers, rats, and other rodents would be greatly impacted. Coyotes are abundant in the proposed zone and I am certain they depend on rabbits and other animals for their livelihood. The impact to the types of sage and other plants that wildlife, sheep, and cattle depend on will be significant, if this land is disturbed. We know the nearby San Antonio Mountain was a volcano at one time and these proposed zones are the geological remains of what happened back then. Once again, the environmental and ecosystem impact will be tremendous, if approved.

I can empathize with the lack of employment in Conejos County and all areas of the United States that are hurting. However, one knows these projects provide temporary employment and a small number of full-time jobs, once the project is completed. I also acknowledge the need for renewable energy. However, I believe there are alternatives that need to be considered, other than proposing government owned land that is currently designated for a purpose such as the proposed one I have talked about. I

know there are private property owners that would be willing to sell their land for this type of development, with water rights attached to it. Let the large companies and the developers/investors seek private land owners that are willing to part with their land and at the same time leave government/public owned lands out of the development process that has the potential to become a private ownership profit. In addition, there are other proposed BLM solar zones that might have no designated purposes, such as livestock grazing permits, etc., and I would support these lands be the ones to approve, because of the lack of impact to current forms of operations that depend on the use of the land.

In conclusion, I will repeat that I am strongly opposed to any approval of the Alta Lake Permit land and the adjacent grazing permit owned by the Moeller family for solar development for the above stated reasons and the reasons I further wish to emphasize below. As mentioned above, I have never been contacted by anyone from BLM regarding my thoughts on the proposal. I don't believe it is professional of BLM staff to not notify me earlier that my permit was being considered for such development. If the current law does not provide a protocol for involving and notifying grazing permittees, I am recommending protocol be implemented during the initial phase of such a proposal in order to adequately treat all involved equitably. I must emphasize there will be environmental and ecosystem impacts which will be significant, if approved.

Also, I am more than willing to testify in person. I am more than willing to become actively involved in this process, as I do not believe it is fair that people that are not aware of the lay of this land and the historical purposes of the land are the only ones involved. I kindly ask that my public comments be shared as the process continues, especially the fact to consider that I would be significantly impacted, if approved. Also, I ask my concerns be further studied and evaluated in order to secure data as to what the impact really is.

Submitted by Carlos Garcia

Thank you for your comment, D. Bradford Hardenbrook.

The comment tracking number that has been assigned to your comment is SEDDsupp20171.

Comment Date: January 27, 2012 20:02:29PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20171

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Comment Submitted:

Please see attachment.

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January 27, 2012

NDOW-SR#: 12-074

Solar Energy Draft PEIS
Argonne National Laboratory
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Re: Supplement to the Draft PEIS for Solar Energy Development in Six Southwestern States; DES 11-49 · DOE/EIS-0403D-S, October 2011 (SDPEIS)

Dear PEIS Team:

In response to the *Draft PEIS for Solar Energy Development in Six Southwestern States* and mindful of the many knowledge gaps regarding wildlife resources in Nevada, the Department of Wildlife (NDOW) recommended solar energy development be limited to the then seven proposed Solar Energy Zones (SEZ's) as an initially responsible, environmentally conservative approach while also allowing for solar energy development over the 20-year life of the PEIS. In the present economic environment of unprecedented budget scarcity, this rationale would provide a reasonable temporal opportunity for performing investigations and acquiring new information useful in development of more reliable conservation management tools and policies affecting wildlife resources and other environmental values affected by the rapid influx of solar energy development. For reasons stated in the SDPEIS, BLM's preference for the Modified Solar Energy Development Program Alternative is received as an answer to NDOW's recommendation.

We can appreciate the several program-based and Solar Energy Zone (SEZ) modifications and elaborations contained in the SDPEIS. The SDPEIS does provide much clearer theoretical insight of the proposed solar energy development programmatic process and guidance. Reduction in the number and sizes of SEZ's, identification of exclusion areas, and a conditional ROW variance application process within the range of the greater sage-grouse and desert tortoise are notable. However, it remains unclear how workforce commitment needs (not restricted to BLM and DOE agency personnel) and associated logistical support (e.g. partnerships, funding) to effectively adjust and implement pre-existing multiple-use and natural resource programs combined with recent energy development programs and policies will be reasonably addressed warranting an unchallenged success.

Published last December, science-based review of available knowledge focusing on wildlife conservation and solar energy development in the desert southwest provides an insightful overview of the types of data gaps and uncertainties (Lovich and Ennen 2011). The overview certainly applies to Nevada. One observation made was water supply needs for thermal-based technologies. This resource is obviously in short supply in Nevada. Until more insightful hydrological study of the affected basins came to light,

NDOW previously recommended that future solar projects be restricted to photo-voltaic (PV) or dry-cooled projects until sustainable water sources could be determined without adversely affecting regional habitats, especially desert spring and riparian systems. Recent efforts by the BLM for performing partnership-based rapid ecological assessments will assist in gaining better regional perspectives, but these tools are limited to existing models and datasets digitally available. In other words, adequate on-the-ground support for filling data gaps necessary in developing (mindful of the many land use plan amendments and revisions required) responsive adaptive management, monitoring, and mitigation in Nevada remains uncertain. The number and kinds of agency and program funding mechanisms likely will remain the same. Unfortunately, discretionary funds supporting many of the federal programs and partnerships that the BLM's Preferred Alternative depends on have been experiencing long-term decline. A similar pattern is also the case for non-federal natural resource agencies and organizations. Development and adherence to implementation plans at the Land Use Plan level might play an important part of the adaptive management and monitoring approach, especially in monitoring funding opportunities and commitments for local program needs, like narrowing prioritized information gaps.

It is clear that the BLM's Modified Solar Energy Development Program Alternative and DOE's Action Alternative will be advanced to the Final PEIS to meet their respective solar energy development programs. Further refinements are anticipated as the final draft of the PEIS progresses. As a cooperating agency to the PEIS process, NDOW has openly requested and expected a more active at-the-table participation in providing and discussing wildlife resource information and management considerations at a higher degree than has occurred to date (i.e. negligible). While some of our observations, concerns, and recommendations to the Draft PEIS have been somewhat addressed in the SDPEIS, the following observations and recommendations provide examples of additional information sharing opportunities that were previously missed or have since become of increased emphasis value with issuance of the SDPEIS.

Page 2-35, Variance Application/Plan of Development (POD) Factors to Be Considered
Lines 15 & 16, strike the last phrase, "*or areas repeatedly burned and invaded by fire-promoting non-native grasses).*" Unless this factor element is further clarified in context, it could predispose the low probability of restoration of an area within the range of special status or sensitive species (e.g. sage-grouse, desert tortoise) to no probability of restoration; it is a potentially problematic precedent to take.

Pages 2-35 to 2-37, *Desert Tortoise Variance Process Requirements under Consideration*:
NDOW's active participation with the BLM and USFWS discussion on these elements is requested.

Page 2-37, *Greater Sage-Grouse Requirements*:
Requirements should be in line with BLM Instruction Memoranda (IM's) #'s 2012-043 and 2012-044. For example, line 23 should indicate a distance of 4 miles (6.4 km) from the nearest lek for consistency with information found in Attachment 1 of IM 2012-0043 (Sage-Grouse National Technical Team. 2011). Note: NDOW is finalizing Habitat Categorization maps for the greater sage-grouse in coordination with the BLM. Current understanding is that these maps will be completed by mid-February 2012.

Nevada Solar Energy Zones (SEZ's) Retained and Modified

Amargosa:

- The region is already becoming populated with several proposed solar developments; limit SEZ to PV or similarly low-volume water demand projects;
- Attention to phylogeographic information gaps and potential regional distribution perspective (inclusive of California) for species like the shovel-nosed snake (*Chionactis occipitalis talpina*) and sidewinder would seem relevant (Wood *et al* 2008, Lovich & Ennen 2011).

Dry Lake Valley North:

- From a wildlife resources standpoint, retaining this SEZ as proposed in the SDPEIS is unclear compared to dropping of the East Mormon Mountain and Delamar SEZ's altogether.

Dry Lake Valley, Gold Point, & Millers:

- Depending on the SEZ, there is potential or real occurrence of the pale kangaroo mouse (*Microdipodops pallidus*), dark kangaroo mouse (*Microdipodops megacephalus*) or both. Recent studies suggest morphologically cryptic speciation (Hafner *et al* 2008, Hafner & Upham 2011). Both species are State-protected and are Nevada BLM sensitive species (Nevada BLM 2011). Habitat characterization and distribution efforts of *Microdipodops* in the southern portion of the Big Smoky Valley (Millers SEZ vicinity) have been underway, but larger-scale efforts are needed to identify distribution hotspots for land use impact avoidance purposes there. Extent of updated distribution of the Desert Valley kangaroo mouse (*Microdipodops megacephalus albiventor*) relative to configuration of the Dry Lake Valley North SEZ is unclear.

Appendix Section C.4:

- Mindful of the aforementioned examples of species information gaps, this section could be expanded with the assistance of NDOW to better identify species/ecological priorities for each of the SEZs.

New SEZ Proposals

In Nevada, deferral of identifying new proposed SEZ's until the end of the 20-year PEIS period would seem reasonable, unless new compelling information surfaces 10-years into the PEIS. This takes into account the need for regularly scheduled, future land use plan revisions, present solar energy facility and transmission development to play out as indicators, and increased knowledge about more local environmental matters.

Page 2-13, Section 2.2.1.2 Adaptive Management and Monitoring:

Assures for adjustments in approaches and process, but could be improved by identifying a sense of funding commitments for implementing these adjustments and on-the-ground actions;

Transmission

- NDOW understands the challenges for ascertaining *a priori* how many and location of transmission projects; however, encouragement of multi-circuit structures would assist in avoiding transmission corridor and ROW bottlenecks as experienced in southern Nevada.
- Transmission projects should use non-lattice design structures to avoid conflicts with increased an dun-natural predation potential on sage-grouse and desert tortoise populations additional to other wildlife.
- Non-lattice line structures and perching discouragers for transmission tie-ins effective for avoiding or minimizing subsidized wildlife predation pressure strongly recommended

References

BLM-Nevada. 2011. Final Sensitive Species List, Microsoft Office Excel Worksheet – 135 KB; finalized October 2011.

Sage-Grouse National Technical Team. 2011. A Report on National Greater Sage-Grouse Conservation Measures. BLM-chartered Planning Strategy. December 21, 2011. Attachment 1 to BLM IM No. 2012-044. 74 pp.

John C. Hafner, Nathan S. Upham, Emily Reddington and Candice W. Torres. 2008. Phylogeography of the Pallid Kangaroo Mouse, *Microdipodops pallidus*: A Sand-Obligate Endemic of the Great Basin, Western North America. *J. Biogeogr.* 35(11): 2102-2118.

Hafner, John C. and Nathan S. Upham. 2011. Phylogeography of the dark kangaroo mouse, *Microdipodops megacephalus*: cryptic lineages and dispersal routes in North America's Great Basin. *J. Biogeogr.* 38(6): 1077–1097.

Lovich, Jeffrey E. and Joshua R. Ennen. 2011. Wildlife Conservation and Solar Energy Development in the Desert Southwest, United States. *BioScience* 61(12): 982-992.

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BLM Director. 2011. Greater Sage-Grouse Interim Management Policies and Procedures. Instruction Memorandum No. 2012-043, USDI Bureau of Land Management, Washington, D.C. 20240. December 22, 2011. EMS Transmission 12/27/2011. Reply Refer to: 1110 (170/200/300/400) P. Two attachments. http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2012/IM_2012-043.html.

BLM Director. 2011. BLM National Greater Sage-Grouse Land Use Planning Strategy. Instruction Memorandum No. 2012-044, USDI Bureau of Land Management, Washington, D.C. 20240. December 27, 2011. EMS Transmission 12/27/2011. Reply Refer to: 1110 (170/200/300/400) P. http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2012/IM_2012-044.html.

As always, NDOW is supportive of national and state goals to develop renewable energy development strategies and technologies while averting significant impacts to Nevada's wildlife resources. We look forward to cooperative participation prior to and as part of the development of the Final PEIS. Thank you again for this review opportunity. For additional assistance, please do not hesitate to contact me at the NDOW Southern Region Office, or Steve Siegel at NDOW's State Headquarters in Reno. He can be contacted by phone at 775-688-1561, or by e-mail at ssiegel@ndow.org.

Sincerely,

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Thank you for your comment, Ceal Smith.

The comment tracking number that has been assigned to your comment is SEDDsupp20172.

Comment Date: January 27, 2012 20:09:46PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20172

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Attachment: SLVRCA SUPP PEIS comment_final.pdf

Comment Submitted:

Please see attached.

San Luis Valley Renewable Communities Alliance

January 27, 2012

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Submitted electronically via: http://solareis.anl.gov/involve/comments/index.cfm

RE: Comments on the Supplemental Draft Solar Programmatic Environmental Impact Statement

To whom it may concern:

On behalf of the San Luis Valley Renewable Communities Alliance (SLVRCA), its members and associates, we submit the following comments on the Supplemental Draft Solar Programmatic Environmental Impact Statement (DPEIS).

SLVRCA is a coalition of farmers, ranchers, biologists, renewable energy advocates and local citizens who view with great concern the industry and government momentum behind siting industrial scale, centralized solar power stations on large swaths of ecologically valuable public lands, particularly in the San Luis Valley, Colorado.

We have come together to urge local, state and national government, utilities, regional environmental groups and the public to abandon this destructive path, and to work toward generating the power we need in the built environment.

In conjunction with our partner organization Solar Done Right, SLVRCA holds that there is a proper hierarchy of priority for strategies to end our nation's addiction to fossil fuels. We should start the switch by using the most cost-effective strategies for renewable energy production, which also happen to be the least environmentally destructive. In descending order of priority:

1. **Reduce demand.** According to some estimates, an aggressive program of conservation and energy efficiency using currently available technology could reduce US power consumption by nearly one third.[1]
2. **Generate renewable energy at or near the point of use.** Distributed solar generation on homes and businesses is cost-competitive and does not incur the energy loss of distribution through transmission lines. Users can benefit through reduced utility bills or sales of power into the grid, or both. Installation time from project conception to completion is measured in weeks rather than years.
3. **Generate renewable energy on a larger scale within the built environment.** Most cities possess large industrial spaces including warehouse roofs, brownfields, large parking lots, airports, and other areas that could be either converted to or augmented with renewable energy production using existing technology. Emerging technologies offer promise for additional methods to incorporate solar energy production into new residential and commercial construction.

***Furthermore,* it should be noted that a focus on both large- and small-scale distributed generation in the built environment is anticipated to create many more jobs than the remote, centralized model now being pursued. A UC Berkeley study published in 2010 concluded that if California instituted a feed-in tariff for projects up to 20 MW in order to achieve its Renewable Portfolio Standard, it would create 3 times as many jobs as without, and would result in $2 billion in tax revenues and billions in new investment.**

The approach described above can meet our electrical energy needs without sacrificing biologically valuable ecosystems in Colorado and other southwestern states with large scale concentrating solar power plants.

Should these common-sense methods fail to meet our society's long-term demand for renewable

[1] http://www.grist.org/article/2009-09-11-how-much-energy-does-the-us-waste/

energy, centralized solar power plants should be sited only on available disturbed, degraded and contaminated lands that offer little carbon sequestration, wildlife habitat or other natural resource values. Renewable technologies that do not deplete scarce arid land water resources should be prioritized. In any event, prudent and responsible renewable energy development should always steer large-scale renewable energy production away from intact public and private wildlands and prime agricultural lands.

SLVRCA shares many of the Environmental Justice/Socioeconomic concerns expressed in the Conejos County Clean Water, Inc. comment letter. These same concerns can be extended to all six counties in the San Luis Valley (Conejos, Costilla, Alamosa, Rio Grande, Mineral and Saguache). All of the SLV Counties have significant Hispanic and low-income populations that are among the poorest in Colorado and the nation.

The industrial solar development scenario embedded in the PEIS could serve to worsen poverty in areas adjacent to industrialized solar zones, impacting these communities unfairly and disproportionately. Executive Order 12898, February 11, 1994, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires BLM and DOE to identify and address potential disproportionately high and adverse human health and environmental impacts on minority and low-income populations. The PEIS does not address environmental justice impacts likely to disproportionately affect low-income San Luis Valley communities, ratepayers and taxpayers including, but not limited to the following:

1. Disproportionate incentives and benefit to absentee private corporations to develop public resources while depriving local communities of traditional livelihood activities (such as grazing) that rely on access to public resources,
2. Creation of a path dependency on remote, centralized industrial solar development that siphons scarce financial, labor, transmission capacity, demand and land resources away from local, community based renewable energy development that would provide significantly more economic and environmental benefits to SLV communities and Colorado, the region and the nation.
3. Significantly higher costs to taxpayers and ratepayers for renewable energy resources compared to local, distributed generation in the built environment, thus exasperating the massive, inequitable wealth gap in the US that underlies many of our economic problems.
4. Inadequate bond requirements that push project infrastructure costs for water, roads, bridges, housing, emergency, fire protection and medical services, and other services on to poor communities,

5. Preferential contractor and vendor requirements that favor large companies and exclude local labor and business,
6. No tangible revenue-sharing mechanism to affected Counties, communities and municipalities.

The San Luis Valley has long been known for its scenic views and rich cultural heritage as one of the nations oldest settled regions. Cultural resource assessments have not been made for the proposed Solar Energy Zones or all areas open to solar industrialization through variance. We strongly advise BLM to consult with known historians and cultural experts in the Valley's Hispanic communities, who have knowledge of cultural and historical resources unavailable to government agencies.

Despite claims from mainstream, urban based environmental groups, the proposed Colorado Solar Energy Zones (SEZ) are not "areas of low conflict" lacking in significant cultural or ecological values. What follows are new concerns specific to Colorado's proposed Solar Energy Zones that are not included in our previously filed oral and written comments.

Fourmile East SEZ

This area is in close proximity, just 9 miles south of the Great Sand Dunes National Park. The site is very likely to harbor many of the same endemic species as GSDNP, but it has not been properly inventoried. Large-scale industrialization so close to a national park, and southern Colorado the San Luis Valley's greatest tourism resource, is totally inappropriate. The PEIS does not address potential impacts on GSDNP and the local economy, due to potentially degraded scenic and biodiversity values.

De Tilla Gulch

While adjustments were made in the Supplemental PEIS to reduce the size of this proposed SEZ, concerns still remain. The site contains valuable habitat for Gunnison's prairie dog, Gunnison's sage-grouse, severe winter range for elk, winter concentration habitat for pronghorn and short-grass prairie that supports the globally vulnerable thirteen-lined ground squirrel and silky pocket mouse. In addition, the site and natural carbon sequestration values.

Antonito Southeast SEZ

The proposed zone includes the Cumbres and Toltec Scenic Railroad that has been designated and Area of Critical and Environmental Concern (ACEC) including the area East of San Antonio Mountain. These high-value hills with flat open range for wildlife grazing, pinon, juniper and ponderosa pine forests should be removed from the SEZ proposal.

Los Mogotes East SEZ

This area is also near a designated ACEC, eight miles southwest of La Jara where the Conejos River forms its southern boundary. The area contains important biological values including supporting a very large (~60,000-acre) Gunnison's prairie dog complex with active colonies, critical winter range for big game species and known Mountain plover nesting sites. It is a traditional hunting area for Antonito and Capulin residents and is characterized by sweeping views of the Sangre de Cristo mountain range. The site is also located immediately west of the Old Spanish Natural History Trail. According to local cultural resource experts, it contains significant undocumented, but important, historical and cultural resources and sites.

Perhaps our largest concern is the failure of the PEIS to adequately assess cumulative impacts. There have been a series of large-scale industrial solar proposals on private lands, as well as new proposals to expand protected areas in the region. The PEIS fails to consider, even in the most rudimentary way, how the PEIS scenario will cumulatively impact the people, wildlife, landscapes, sense of place values, health, socioeconomics and environment in the San Luis Valley and Colorado.

In conclusion, we believe the Draft Solar PEIS, and the path it lays out for our County's renewable energy future, remains fundamentally flawed.

The DOI, DOE and BLM are required to consider a far broader range of alternatives including full consideration of distributed generation in the built environment and EPA's **RE-Powering America Plan**. Arizona has worked closely with EPA to identify severely degraded lands that we encourage all State's involved in the PEIS to implement according to the Solar Done Right hierarchy of priority for solar development outlined above.

While the Energy Policy Act—upon which Interior leans—expressed Congress' "sense" that Interior "should seek to have approved" a stated amount of non-hydropower renewable energy on public land, it did not establish a mandate. Interior is not required to engage in this radical privatization of public lands for industrial solar energy development, and in light of the evidence

regarding the damage it would cause, has the discretion to, and must, change course.

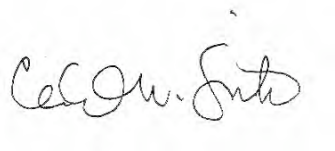
In addition to turning to degraded, contaminated sites, there is vast potential to get outmoded, environmentally destructive solar off public lands through the alternative of distributed generation through solar PV installations in the built environment.

The PEIS dismisses distributed generation on the basis of defining the purpose and need as "[responding] in a more efficient and effective manner to the *high interest in siting utility-scale solar energy development* on public lands." This purpose and need statement, and the alternatives formulated for it, are disproportionally and unfairly geared towards meeting the interests of large corporations rather than on the urgent need to renew our communities through ***local*** economic development and jobs, build a more efficient and reliable energy system, and reduce our fossil fuel use in the least damaging, most cost-effective and sustainable way.

The PEIS process has cost millions of public dollars, absorbed the time and energy of thousands of people, and yet has utterly failed to move us one inch closer to a cost-effective, efficient, smart or environmentally responsible renewable-energy policy.

We join with Solar Done Right in calling on the BLM to either expand the PEIS analysis away from industrial-scale development on public lands or relinquish its role as the ill-chosen federal standard-bearer for renewable energy.

Sincerely,



Ceal Smith
On behalf of SLVRCA members and affiliates

Thank you for your comment, Michael Govan.

The comment tracking number that has been assigned to your comment is SEDDsupp20173.

Comment Date: January 27, 2012 20:10:56PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20173

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Attachment: Letter to Solar Energy Programmatic EIS.pdf

Comment Submitted:

January 25, 2012

To: Solar Energy Programmatic EIS
Argonne National Laboratory
9700 S. Cass Avenue - EVS/240
Argonne, IL 60439

RE: Protecting Coal Valley and Garden Valley, Nevada to preserve City

To Whom It May Concern:

On behalf of the Los Angeles County Museum of Art ("LACMA"), I am writing to strongly urge that the Coal and Garden Valleys in Nevada be excluded from any potential solar energy development by the Bureau of Land Management ("BLM"). These valleys house Michael Heizer's City project, the largest of a series of epic-scale earthworks by American artists in the western part of the United States. Any development in the region would undermine City's artistic value, as well as the substantial support that has been provided by numerous Foundations, individuals, and institutions across the country, including LACMA.

City began as a vision by the artist Michael Heizer in 1972, and over the course of the next four decades has grown to a size equivalent to the National Mall. City is among the largest sculptures ever constructed, deriving its inspiration from a variety of landscapes and art forms. Utilizing the most modern building technologies to create his timeless, awe-inspiring forms, Heizer's City will stand as one of the most remarkable and famous monuments of our time. While the project is not yet complete, it has already earned international recognition and, once finished, the sculpture will continue to have a positive impact on the local economy by drawing visitors from around the globe.

City has drawn interest from museums across the United States, universities, and institutions involved in culture and the arts. It has also been the subject of coverage in prominent media outlets like the The New York Times. LACMA and other supporters of City believe it to be a critically important piece of art that should be preserved in its purest form.

Michael Heizer chose the location for City based on the beauty, remoteness and undeveloped nature of Coal and Garden Valleys—an essential component of City. This nearly complete masterpiece, world-renowned even in its unfinished state, is threatened. Under the current draft Programmatic Impact Statement ("PEIS"), we believe that while Garden Valley is protected, Coal Valley would be subject to solar development. Such a decision would jeopardize the isolation and natural surroundings of City that inspired Heizer to create it. In addition to the national sponsors, there are a number of philanthropic supporters of Heizer's project in Garden Valley. A collective investment in this project of national and international cultural importance would be lost.

In order to avoid this outcome, we believe that the PEIS could be improved by removing Coal Valley from consideration, and ensuring that Garden Valley is excluded as well. It is the only way to ensure that students, scholars, and other visitors to the site may fully experience City in its purest form for years to come. Once the sculpture is finished, visitors to the artwork and local

employment for the maintenance of the project will have a positive ongoing effect on the local economy. I urge BLM to seek alternates for the solar energy development that would mitigate the impacts on this important cultural resource, the Coal and Garden Valleys, and their inhabitants.

Thank you for your time and consideration.

Sincerely,

Michael Govan
CEO and Wallis Annenberg Director
Los Angeles County Museum of Art

LACMA LOS ANGELES COUNTY MUSEUM OF ART
5905 WILSHIRE BOULEVARD
LOS ANGELES CALIFORNIA 90036

MICHAEL GOVAN

CEO/WALLIS ANNENBERG DIRECTOR
T 323 857 6001
F 323 857 6148

January 25, 2012

To: Solar Energy Programmatic EIS
Argonne National Laboratory
9700 S. Cass Avenue - EVS/240
Argonne, IL 60439

RE: Protecting Coal Valley and Garden Valley, Nevada to preserve *City*

To Whom It May Concern:

On behalf of the Los Angeles County Museum of Art ("LACMA"), I am writing to strongly urge that the Coal and Garden Valleys in Nevada be excluded from any potential solar energy development by the Bureau of Land Management ("BLM"). These valleys house Michael Heizer's *City* project, the largest of a series of epic-scale earthworks by American artists in the western part of the United States. Any development in the region would undermine *City's* artistic value, as well as the substantial support that has been provided by numerous Foundations, individuals, and institutions across the country, including LACMA.

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Thank you for your time and consideration.

Sincerely,

Michael Govan
CEO and Wallis Annenberg Director
Los Angeles County Museum of Art

Thank you for your comment, Michael Powelson.

The comment tracking number that has been assigned to your comment is SEDDsupp20174.

Comment Date: January 27, 2012 20:11:07PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20174

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Attachment: SOLAR_PEIS_MITIGATION_LETTER_20120127.pdf

Comment Submitted:

See attachment

January 27, 2012

Mr. Bob Abbey
Director
Bureau of Land Management
Solar Energy PEIS
Argonne National Laboratory
9700 South Cass Avenue
Argonne, IL 60439

Dear Mr. Abbey:

Thank you for the opportunity to comment on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development (SDPEIS). Our organizations greatly appreciate the tremendous effort BLM has undertaken in the development of the draft PEIS and the subsequent Supplement, to create a solar development program. However, a critical aspect of a comprehensive solar development program is essentially absent, that of mitigation.

Mitigation, and specifically compensatory mitigation, provides an essential opportunity to protect the health of the nation's land, waters, and wildlife, while facilitating cost-effective, efficient and timely development of our nation's energy resources. To best meet the nation's conservation and energy development goals requires creating a mitigation program that is transparent, systematic, based on sound science, and addresses clear conservation priorities. Many (if not all) of the elements of a comprehensive mitigation program BLM is already using, developing or exist. The BLM/DOE Solar PEIS provides an opportunity to mesh these elements together under a consistent policy framework. The goal is clear policies establishing how compensatory mitigation is integrated into project NEPA documents and BLM decisions for all projects, leading to increased effectiveness and accountability of offsite mitigation while providing project developers, agency staff, and stakeholders with greater certainty regarding mitigation objectives and methods for implementing offsite mitigation. BLM appears to rely on the project proponent to design and develop mitigation proposals with little advance guidance, leading project developers to spend significant time and money developing a plan with very little idea of what will ultimately be required. And for a variety of reasons, project developers are not appropriate entities to design and implement compensatory mitigation.

The PEIS should define a mitigation *framework* that captures the mitigation hierarchy and drives siting and mitigation. The undersigned recommend that the mitigation hierarchy, i.e. avoid, minimize and offset, should be the guiding principle in establishing a mitigation framework and a subsequent compensatory mitigation program. These recommendations are principally focused on "offsets," i.e. compensatory offsite mitigation, however it is important that the entire mitigation hierarchy by addressed in the PEIS.

The primary and most important basis of a mitigation framework, and the basis for a compensatory mitigation program, is an understanding of the ecological attributes of the lands under consideration. We r**ecommend** the PEIS commit to using landscape-scale and finer scale ecological assessments that articulate the ecological health, status and/or condition of the species, habitats, migration corridors, and related values, e.g. recreation, across the landscape of potential development and any subsequent mitigation, i.e. the geographic scope of the PEIS. The PEIS should specifically commit, at a minimum, to incorporating and using existing and ongoing ecological analysis, especially those of its own creation and those of the affected States. Much of this information is currently available or under development by the BLM (and sister DOI agencies and contractors), States, and organizations like The Nature Conservancy and Natureserve. This includes BLM's Rapid Ecological Assessments (REAs), products created for the PEIS by Argonne and others, products produced by BLM's Assessment, Monitoring and Inventory (AIM) efforts, the California Desert Renewable Energy Conservation Plan (DRECP), BLM's Restoration Design Energy Project in Arizona, State Wildlife Plans, State Decision Support Systems (DSS), The Nature Conservancy's Mojave eco-regional assessment and West Mojave least conflict analysis.

A mitigation framework within the PEIS should seek to avoid ecological impacts to the greatest extent possible, especially to resources that cannot be mitigated or are declining – avoiding impacts by proper siting based on ecological analyses is the surest, easiest and best way to avoid subsequent mitigation demands. Significant impacts to habitat that supports special functions and values may simply not be replaceable through mitigation and therefore the best course may be to avoid those areas altogether. We recommend the PEIS identify specific lands where development should not occur. This list should be expanded to exclude development where there are ecological or other resources that are not mitigatable, declining, limited or rare, and should take into account the cumulative effects of development in determining these attributes.

After avoidance, a mitigation framework within the PEIS should seek to minimize ecological impacts through project design, and require Best Management Practices (BMPs) that specifically seek to minimize impacts during construction, operation, maintenance, and decommissioning, including implementing appropriate conservation measures related to timing and conduct of project activities. While the PEIS has extensive discussion of project siting, construction and operational BMPs, it provides little ecological and subsequent monitoring criteria to ensure that impacts are minimized to the greatest extent possible, especially to groundwater. The PEIS should establish clear ecological benchmarks that developers are to address in project development and operation.

The last facet of a mitigation framework is compensation for residual impacts (direct and indirect effects that are not avoided or minimized on-site) by providing replacement habitats, restoration of habitats, or other benefits, e.g. management actions that provide conservation benefits. The mitigation hierarchy recognizes that offsite mitigation is an inherently uncertain undertaking, which means that compensatory mitigation is sought only after efforts to avoid and minimize the impacts have been addressed. Inclusion of a compensatory mitigation program in the PEIS is the most efficient, cost-effective way to ensure the mitigation hierarchy is fully addressed within the mitigation framework.

A robust compensatory mitigation program consists of six elements:

1. An ecological baseline upon which unavoidable impacts are assessed.
2. A transparent mechanism or methodology to assess & quantify unavoidable impacts over the life of the impacts.
3. A consistent methodology to translate the impacts into dollars, i.e. mitigation investments.
4. A structure to hold, prioritize and apply mitigation investments. At a minimum the structure should include BLM, the USFWS, and State Fish and Game agencies – we recommend that key stakeholders be represented as well, including counties and conservation, sportsmen and recreation organizations.
5. A prioritization, e.g. conservation plan, as to where and how mitigation investments should be made to address impacts while seeking the highest return on investment.
6. Monitoring to ensure mitigation investments are adequate relative to impacts over the life of the impacts, with a feedback loop to ensure the mechanism to assess and quantify the impacts and the methodology to translate the impacts into mitigation investments adequately reflect sufficient mitigation.

We recommend the PEIS, at a minimum, include the establishment of a compensatory mitigation program that encompasses the six elements listed above, including at a minimum, attributes for each element that inform how they would be structured and implemented.

Thank you for your consideration of our comments. We look forward to working with BLM on creating a mitigation framework and specifically regional mitigation plans that ensure protection of our countries critical natural resources while allowing the robust development of solar energy.

Sincerely,

Robert Bendick
Director, U.S. Government Relations
The Nature Conservancy

Gary Taylor
Legislative Director
Association of Fish and Wildlife Agencies

Steve Williams
President
Wildlife Management Institute

Boone & Crockett Club

Miles Moretti
President/CEO
Mule Deer Foundation

Thank you for your comment, Pat Flanagan.

The comment tracking number that has been assigned to your comment is SEDDsupp20175.

Comment Date: January 27, 2012 20:26:43PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20175

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Country: USA
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Attachment: MBCA comments to SPEIS_Jan 2012.pdf

Comment Submitted:

MBCA
morongo basin conservation association
P. O. Box 24 Joshua Tree California www.mbconservation.org

To: US Bureau of Land Management
Supplemental Draft PEIS Comments
Argonne National laboratory
9700 S. Cass Avenue, EVS/240
Argonne, IL 60439

Submitted electronically via: http://solareis.anl.gov/involve/comments/index.cfm

January 27, 2012

RE: Comments on the Supplemental Draft Solar Programmatic Environmental Impact Statement

To Whom It may Concern:

In July 2008 and May 2011, the Morongo Basin Conservation Association (MBCA) provided comments on the Scoping and DPEIS. We are pleased for the opportunity to comment on the Supplemental Draft PEIS Solar Energy Development Programmatic Environmental Impact Statement (SDPEIS).

The Morongo Basin Conservation Association is a 501(c) (4), community-based, California Non-Profit Corporation. The MBCA is the oldest collective voice in our area for educating the Morongo Basin"s citizens about the unique and valuable natural desert environment surrounding us. MBCA was founded in 1969, during a successful 11-year campaign to avert the imposition of power lines through the Morongo Basin by Southern California Edison. We have continued to be vigilant in seeking to protect the desert ecosystem surrounding us.

We are concerned that this plan proposed by the federal government to support renewable energy continues to subvert our efforts as desert citizens to preserve and protect desert resources and the interests of desert communities. We support energy usage reduction and renewable energy in a local distributed mode ("rooftop solar") as the primary goals in reducing carbon emissions and meeting energy needs. The federal government"s own 2006 Climate Technology Strategic Plan[1] listed distributed and community-scale technologies as important methods to meet goals for reducing emissions from end use and infrastructure (p. 79) and reducing emissions from the energy supply (p. 111).

[1] US Climate Change Technology Program, Strategic Plan. DOE/PI-0005, September 2006.

California

Today California is a leader in the production of rooftop solar energy. Among the top 25 nations, California ranks as the 6th in Solar PV construction[2]

> **California's Solar Market Is Growing Rapidly**
>
> *Over the last decade, the market for solar energy systems on or near homes and buildings in California grew nearly 100-fold. In 2000, California had fewer than 1,000 rooftop solar systems, with less than 10 megawatts (MW) of total electric generation capacity. In 2011, California passed the milestone of installing 1,000 MW of distributed solar capacity, with more than 100,000 separate installations. The state is on track to achieve the goal of the 2006 Million Solar Roofs Initiative, adding 3,000 MW of distributed solar capacity by the end of 2016.*[3]

The Morongo Basin"s incorporated cities and unincorporated areas are having their own impact on California"s renewable energy quotas.

Data in chart below is excerpted from Appendix 1: Alphabetical Listing for all Cities in California[4].
The chart contains the data for the total number and total capacity of grid-tied solar systems installed in all of California's incorporated cities in alphabetical order.

City	# Solar PV Installed	Rank by Total Installations	Total Solar PV Capacity	Rank by total PV Capacity
Twentynine Palms	57	320	258	418
Yucca Valley	52	335	254	419
Joshua Tree	46	358	360	374

In addition the following projects are under construction on private land within the Morongo Basin. These projects feed into the Southern California Edison grid and support the daily energy needs of local citizens and businesses.

- SEPV8, a 12 MW project on 100 acres and
- SEPV2 a 2 MW project on 20 acres

Our actions speak for themselves; Solar PV is an essential and growing enterprise in the Morongo Basin.

Morongo Basin, San Bernardino County, CA

Rather than speak in general, our intent in this letter is to demonstrate how it appears the SDPEIS might affect the basin environment, its citizens, their economy, and quality of life. The Morongo Basin spans 1,400 square miles in the Mojave Desert and is notable for is richly varied wide open landscapes and numerous human and wildlife communities. Topographically it is a well defined

[2] California Solar Cities 2012: Leaders in the race towards a clean energy future. California Environment Research and Policy Center http://www.environmentcalifornia.org/sites/environment/files/reports/California%27s%20Solar%20Cities%202012%20-%20Final.pdf

[3] Ibid.

[4] Ibid.

basin and range region with the San Bernardino Mountains to the west, the Little San Bernardino Mountains to the south, the Bullion Mountains to the north, and the lower elevations of Wonder Valley to the east. The sense of place, as well as the economic drivers for the 70,000 basin residents and businesses are Joshua Tree National Park (JTNP -1.4 million visitors in 2010) and the Marine Corp Air Ground Combat Center (MCAGCC).

Connectivity and Variance Lands

The region is a stronghold for the endangered desert tortoise as well as the iconic desert bighorn sheep and mountain lion. For these and numerous other animal and plant species the mountain ranges are conservation blocks providing habitats currently connected across the basin but in danger of fragmentation. The designated SDPEIS Variance lands threaten to fracture the desert ecosystem with its piecemeal approach, ignoring the fragile and essential connections that keep desert ecology intact and functioning.

The 2010 release of the *Mojave Desert Ecoregional Assessment* [5] by The Nature Conservancy brought to national attention the intactness of the Mojave Desert ecoregion. This intactness supports a healthy functioning ecosystem with a high level of biodiversity which we have yet to fully document:

> *Using the trends from the past 50 years and extrapolating forward in time, we can expect to discover another 200 native plant species in the California deserts over the next 50 years. Thus, approximately nine percent of today's California desert plants are not yet named by science.*[6]

In the belief that a functional network of connected wildlands is essential to the continued support of California"s diverse natural communities in the face of human development and climate change, the California Department of Transportation, the California Department of Fish and Game, and the US Department of Transportation commissioned the *California Essential Habitat Connectivity Project*.[7] It was completed in 2010. The *California Desert Connectivity Project* is currently underway to complete the 23 desert linkage designs. Ecological integrity or "naturalness" is used as primary basis for defining the natural landscape blocks.[8] The location and landscape wide acreage available for large scale solar development and transmission lines under the DSPEIS "No Action"

[5] Randall, J.M., S.S. Parker, J. Moore, B. Cohen, L. Crane, B. Christian, D. Cameron, J. MacKenzie, K. Klausmeyer and S. Morrison. 2010 Mojave Desert Ecoregional Assessment. Unpublished Report. The Nature Conservancy, San Francisco, California. 106 pages + appendices. Available at http://tinyurl.com/3t5rapn

[6] Andre, James; director, University of California Granite Mountains Desert Research Center. Email communication to Solar Done Right, February 17, 2011. Reported in US Public Lands Solar Policy: Wrong from The Start. P.7. April 4, 2011. Available for download at www.solardoneright.org .

[7] Spencer, W.D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Strittholt, M. Parisi, and A. Pettler. 2010. California Essential Habitat connectivity Project: A Strategy for Conserving a Connected California. Prepared for California Department of Transportation, California Department of Fish and Game, and US Department of Transportation. www.scwildlands.org

[8] Ibid. p.5

and Modified Program Alternatives do not support the ecological integrity essential for successful linkage design. This research was timely but not found to be referenced in the Draft or Supplemental PEIS. The *California Essential Habitat Connectivity Project* map which includes the Desert Wildlands Blocks and the targeted linkages is provided on page 8 of this letter.

BLM lands are located in the basin, and throughout the California Desert, in a more or less hap-hazard array of varying size blocks of land with differing classifications. In the Morongo Basin BLM unclassified lands are checker-boarded with private lands. For instance, in the lower elevations surrounding Copper Mountain the average size of BLM unclassified parcels is 11 acres and the average size of private parcels is 8 acres. In the Pinto Mountain area, bordering JTNP, the No Action designation covers the 11,716 acre Pinto Mountain DWMA and a portion of the Mojave Fringe-toed Lizard ACEC.

The Morongo Basin was the first desert area to be thoroughly studied by South Coast Wildlands for linkage designs.[9] The Joshua Tree – Twentynine Palms connection specifically addressed how to prevent JTNP and MCGACC from becoming ecological islands. How do the linkage designs in the Morongo Basin overlap with the BLM Variance lands? The attached map (page 9 of this letter), produced by the Sonoran Institute, visualizes Variance lands in relation to the wildlife linkage designs. Both the No Action and the Modified Program Alternative obstruct the linkage designs at their north and south portals as well as many of the mid-linkage areas. The Modified Program Alternative carpets the residential community of Wonder Valley. Since the No Action (pink) lands remain on the map it is assumed that both wind and solar applications will be processed.

The SDPEIS maps show that non-wilderness BLM lands are never out of consideration for utility scale solar development, the rules just change. For instance, the „excluded" areas in the Riverside East SEZ show up on the map as pink No Action zones. The same is true for the „excluded" lands within the proposed Mojave Trails National Monument which are now No Action pink. Lands purchased with private monies and donated to the federal government for conservation, for example the former Catellus lands, should be fully excluded from the variance process. As it stands currently, they are mapped as No Action pink lands within the proposed Variance lands. We question: what does exclusion really mean? **Instead of blanketing all unprotected BLM land (non-wilderness) with a Variance designation of one kind or another, we suggest Variance lands should be eliminated throughout the California Desert. At a minimum, remove the No Action unfiltered lands from consideration including those purchased for their conservation values and gifted to the federal government.**

Local Planning

[9] South Coast Wildlands Reports: *A Linkage Design for the San Bernardino – Little San Bernardino Connection* 2005 and *A Linkage Design for the Joshua Tree – Twentynine Palms Connection* 2008 www.scwildlands.org

The 70,000 residents of the Morongo Basin are governed by General Plans developed by the Town of Yucca Valley, the City of Twentynine Palms, and the San Bernardino County including the Joshua Tree Specific Plan. The State of California mandates that the cities and counties develop General Plans so that growth and development is managed in an orderly well-planned manner that respects the natural environment, existing neighborhoods, and enhances community values. General Plan (GP) development and their updates take thousands of professional and citizen volunteer hours and can cost in excess of a million dollars. All of the mandated seven elements in a GP carry equal weight and must be consistent. The GP is the basis for the development code and ordinances. The GP undergoes a CEQA review. The linkages designs are incorporated in the local GPs as elements for land use, open space, and conservation planning. Although what happens in the Variance lands must be consistent with BLM land use plans, there is no certainty of consistency with local GPs.

In Table 2.3-2 it is stated that industrial solar development *could alter the character of largely rural areas.* There is no requirement for BLM to evaluate projects against local General Plans, development codes or ordinances. Rural communities, whose livelihood depends on its surrounding open space, deserve the same notification as livestock grazing operators (page 2-5). **Consultation with city and county planners and local citizen stakeholders is essential throughout the process.**

Local Economy

Future approved utility scale solar projects on BLM Variance lands could be considered a type of rogue sprawl development which does not contribute to orderly growth and development, does not support the tourism based economy, does not return significant revenue to local and county governments, does not provide any significant number of long term jobs, significantly threatens the wildlife linkages, and compromises the view shed for Joshua Tree National Park (JTNP) and the gateway communities. Visual Resource comments in Table 2.3-3 notes that a SEZ is visible within 25 miles of 149 sensitive resources in the Modified Alternative. The number increases to 1,510 for the No Action Alternative. **Using your figures, we request a 25 mile exclusion area around national parks.** This will go a long way toward avoiding projects that impact local planning and tourism economies of our gateway communities.

The economic value of JTNP to tourism was emphasized in two recent conferences – The Western Governors Conference in Yucca Valley and JTNP"s mini-conference "Economic Relationship Between National Parks and Gateway Communities." Following is a summary of remarks by Daniel Stynes, professor emeritus from Michigan State University who developed the NPS money generation model 2:

- JTNP"s 2010 economic impact: 1.44 million visits, 287,765 overnight stays. $58.8 million visitor spending within 30 miles, $6.4 million inside park. Local impact was 732 jobs, $23.4 million in labor income and $37.9 million value-added. The park itself has 140 employees

with an annual payroll of $8 million. Payroll impact is 162 jobs, $8.8 million labor income and $9.6 million value-added. Park payroll and visitor spending equal 900 local jobs.

• Per party per trip, locals spend $10.93 outside the park per visit, day-trippers spend $40.56; those who stay overnight spend $451.07, campers spend $84.67 and others spend $27.09.

• In 2010, 666,024 visitors spent $58.8 million in the Basin. Breakdown: Hotels/motels $20.6 million (35 percent); restaurants/bars $10.5 million (18 percent); gas and oil, $9.3 million (16 percent); groceries $4.6 million (8 percent); local transportation $4.4 million (7 percent); souvenirs $4.1 million (7 percent); camping fees $1.4 million (2 percent).

• Most visitors stay outside the park and many visit other area attractions. Spending inside the park is limited. Total package for visitors is Lodging, food, amusements, recreation, transportation, information, souvenirs.

• Officials must look at how to reach local visitors, day-trippers (those living within 60 to 90 miles), overnighters, national/international visitors. **They also must look at trip purposes: Biggest spenders are general sight-seers,** next is activity-oriented visitors, those for whom the park is their primary destination and those coming for special events.

The assumption that Utility Scale Solar Development will benefit the local economy needs to be tested against the data in the NPS Money Generation Model for Joshua Tree National Park[10].

Adaptive Management and Monitoring

We draw your attention to the recent paper in BioScience "Wildlife Conservation and Solar Energy Development in the Desert Southwest, United States".[11] The abstract is quoted below.

> *Large areas of public land are currently being permitted or evaluated for utility-scale solar energy development (USSED) in the southwestern United States, including areas with high biodiversity and protected species. However, peer-reviewed studies of the effects of USSED on wildlife are lacking. The potential effects of the construction and the eventual decommissioning of solar energy facilities include the direct mortality of wildlife; environmental impacts of fugitive dust and dust suppressants; destruction and modification of habitat, including the impacts of roads; and off-site impacts related to construction material acquisition, processing, and transportation. The potential effects of the operation and maintenance of the facilities include habitat fragmentation and barriers to gene flow, increased noise, electromagnetic field generation, microclimate alteration, pollution, water consumption, and fire. Facility design effects, the efficacy of site-selection criteria, and the*

[10]Daniel J. Stynes, Michigan State University http://35.8.125.11/mgm2_new/

[11] Jeffrey E. Lovich and Joshua R. Ennen. Wildlife Conservation and Solar Energy Development in the Desert Southwest, United States. BioScience 61:982-992

cumulative effects of USSED on regional wildlife populations are unknown. Currently available peer-reviewed data are insufficient to allow a rigorous assessment of the impact of USSED on wildlife.

This peer-reviewed paper sets a high bar for the adaptive management and monitoring strategy developed by the U.S.G.S. **These findings by Lovich and Ennen must be incorporated into the adaptive management and monitoring implementation strategy in the Final Solar PEIS.**

The Morongo Basin Conservation Association also supports the conclusions of Solar Done Right. www.solardoneright.org

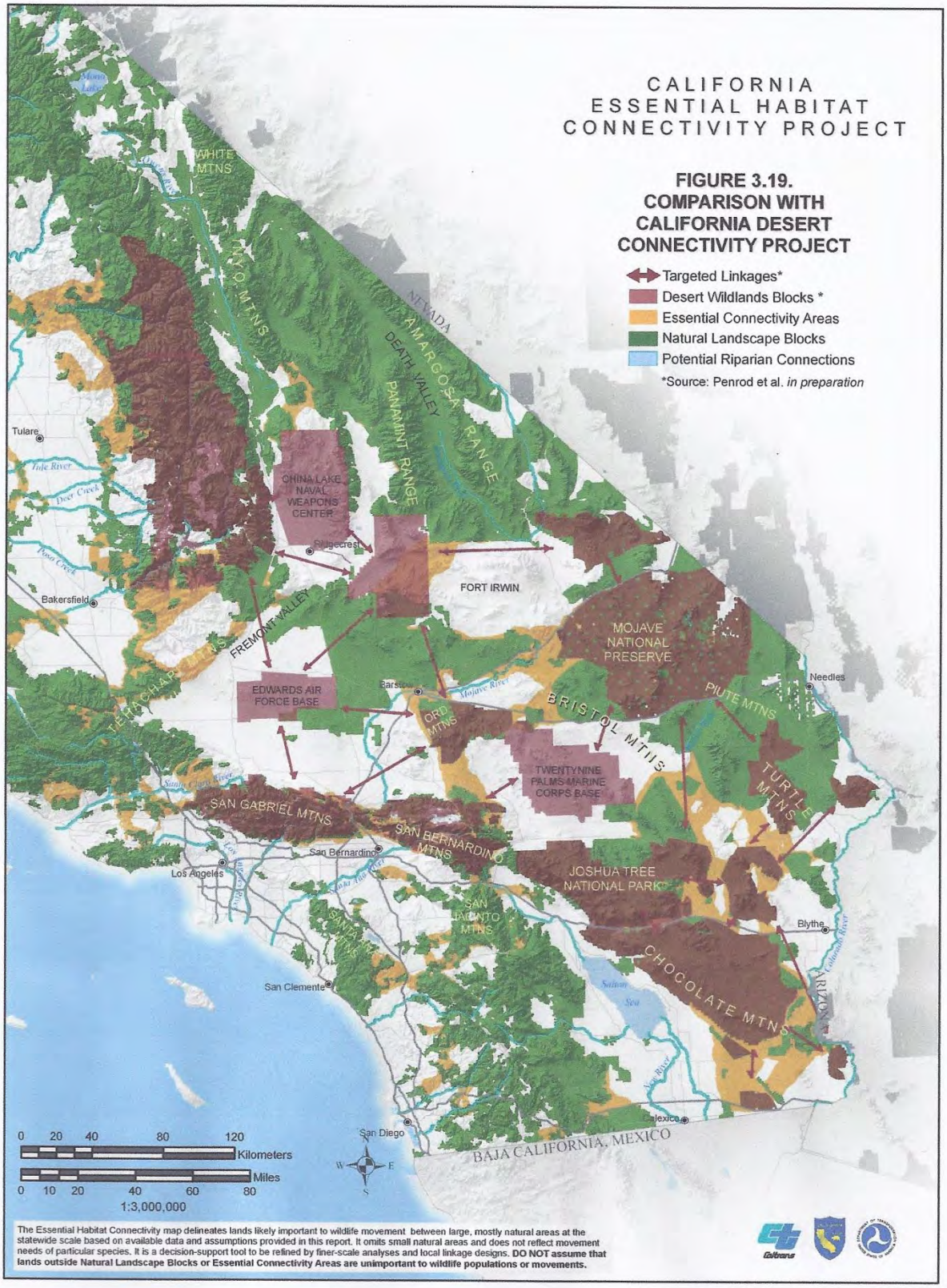
Habitat destruction threatens the diversity of life on our planet. Renewable energy strategies that damage habitat only make the problem worse. Distributed generation such as rooftop solar is the faster, cheaper, cleaner and more effective way of meeting our energy needs in the next century.

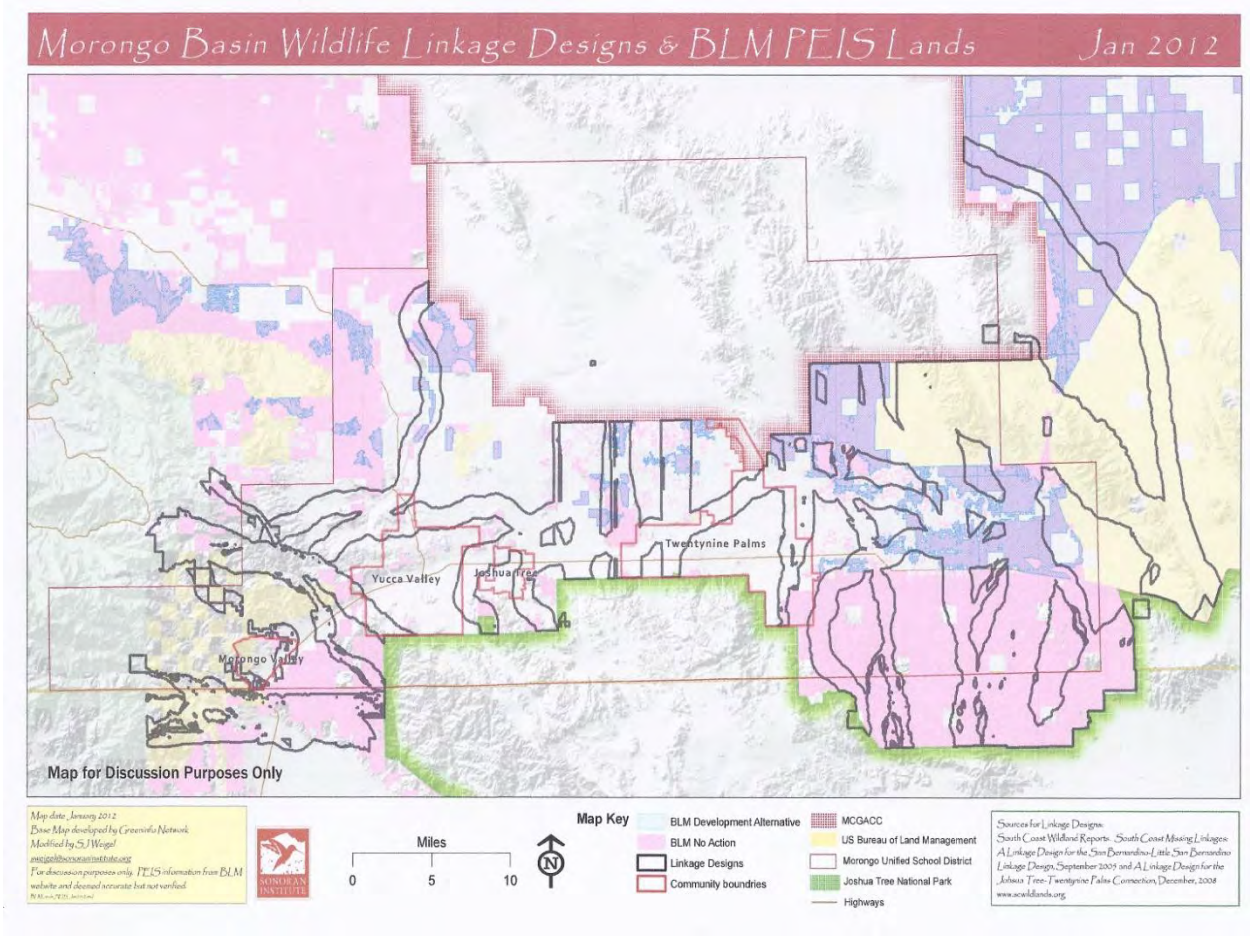
In summary, here are our recommendations:

1. **Instead of blanketing all unprotected BLM land (non-wilderness) with a Variance designation of one kind or another, we suggest Variance lands should be eliminated throughout the California Desert. At a minimum, remove the No Action unfiltered lands from consideration including those purchased for their conservation values and gifted to the federal government.**
2. **Consultation with city and county planners and local citizen stakeholders is essential throughout the process.**
3. **We request, at a minimum, a 25 mile exclusion area around national parks.**
4. **The assumption that Utility Scale Solar Development will benefit the local economy needs to be tested against the data in the NPS Money Generation Model for Joshua Tree National Park**
5. **These findings by Lovich and Ennen must be incorporated into the implementation plan for the strategy in the Final Solar PEIS.**
6. **These findings by Lovich and Ennen must be incorporated into the adaptive management and monitoring implementation strategy in the Final Solar PEIS.**

Sincerely,

Pat Flanagan,
Board Member, MBCA


CALIFORNIA
ESSENTIAL HABITAT
CONNECTIVITY PROJECT
FIGURE 3.19.
COMPARISON WITH
CALIFORNIA DESERT
CONNECTIVITY PROJECT
Targeted Linkages*
Desert Wildlands Blocks *
Essential Connectivity Areas
Natural Landscape Blocks
Potential Riparian Connections
*Source: Penrod et al. in preparation
WHITE MTNS
INYO MTNS
NEVADA
AMARGOSA RANGE
DEATH VALLEY
PANAMINT RANGE
Tulare
Tule River
Deer Creek
Poso Creek
Bakersfield
CHINA LAKE NAVAL WEAPONS CENTER
Ridgecrest
FORT IRWIN
FREMONT VALLEY
TEHACHAPI MTNS
EDWARDS AIR FORCE BASE
Barstow
Mojave River
MOJAVE NATIONAL PRESERVE
Needles
PIUTE MTNS
BRISTOL MTNS
ORO MTNS
TWENTYNINE PALMS MARINE CORPS BASE
TURTLE MTNS
SAN GABRIEL MTNS
SAN BERNARDINO MTNS
San Bernardino
Los Angeles
JOSHUA TREE NATIONAL PARK
SAN JACINTO MTNS
SANTA ANA MTNS
Blythe
CHOCOLATE MTNS
ARIZONA
San Clemente
Salton Sea
New River
Mexicali
San Diego
BAJA CALIFORNIA, MEXICO
0 20 40 80 120
Kilometers
0 10 20 40 60 80
Miles
1:3,000,000
The Essential Habitat Connectivity map delineates lands likely important to wildlife movement between large, mostly natural areas at the statewide scale based on available data and assumptions provided in this report. It omits small natural areas and does not reflect movement needs of particular species. It is a decision-support tool to be refined by finer-scale analyses and local linkage designs. DO NOT assume that lands outside Natural Landscape Blocks or Essential Connectivity Areas are unimportant to wildlife populations or movements.


Morongo Basin Wildlife Linkage Designs & BLM PEIS Lands
Jan 2012
Twentynine Palms
Yucca Valley
Joshua Tree
Morongo Valley
Map for Discussion Purposes Only
Map date: January 2012
Base Map developed by Greenwire Network
Modified by S.J.Weigel
sweigel@sonoraninstitute.org
For discussion purposes only. PEIS information from BLM website and deemed accurate but not verified.
SONORAN INSTITUTE
Miles
0
5
10
N
Map Key
BLM Development Alternative
BLM No Action
Linkage Designs
Community boundries
MCGACC
US Bureau of Land Management
Morongo Unified School District
Joshua Tree National Park
Highways
Sources for Linkage Designs:
South Coast Wildland Reports. South Coast Missing Linkages: A Linkage Design for the San Bernardino-Little San Bernardino Linkage Design, September 2005 and A Linkage Design for the Johua Tree-Twentynine Palms Connection, December, 2008
www.scwildlands.org

Thank you for your comment, Ginger Torres.

The comment tracking number that has been assigned to your comment is SEDDsupp20176.

Comment Date: January 27, 2012 20:37:07PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20176

First Name: Ginger
Middle Initial: S
Last Name: Torres
Organization: Pacific Gas and Electric Company
Address: 77 Beale Street, Mail code B24A
Address 2:
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City: San Francisco
State: CA
Zip: 94105
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: PGE Comments on the Supplement to the Solar PEIS 1-27-12.pdf

Comment Submitted:

Please find attached comments on the Supplement to the Solar Energy Development Draft Programmatic Environmental Impact Statement submitted by the Pacific Gas and Electric Company. See Attachment.

Thank you,
Ginger Torres on behalf of Diane Ross-Leech

Pacific Gas and Electric Company®

Diane Ross-Leech
Director
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January 27, 2012

Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue
EVS/240
Argonne, IL 60439

Subject: **Pacific Gas and Electric Company's Comments on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States**

Dear Solar PEIS Team:

Pacific Gas and Electric Company (PG&E) appreciates the opportunity to comment on the Supplement to the Solar Energy Development Draft Programmatic Environmental Impact Statement (PEIS) (Supplement) published in October 2011. We commend the work of the administration and federal agencies in addressing more than 80,000 comments received on the Draft Solar PEIS and proposing new strategies to resolve the complex issues associated with facilitating large-scale solar energy development on public lands.

PG&E is committed to providing safe, reliable, and affordable energy to 15 million Californians in the northern and central parts of the state and to being a partner in California's clean energy future. PG&E expects that new resources under development will allow us to meet the Renewable Portfolio Standard (RPS) compliance goals established in the recent 33 percent RPS by 2020 legislation. We have signed more than 110 RPS-eligible contracts since the start of the RPS program in 2002.

To meet California's aggressive RPS goals, development of additional RPS eligible resources is necessary. This development faces significant challenges in California, including lengthy and costly permitting and environmental review delays. PG&E appreciates the work of the administration and agencies in ensuring that all of the key energy policymakers in the six Southwestern states work together to achieve our mutual energy and environmental goals in a coordinated, comprehensive, and cost-effective manner.

PG&E supports the development of renewable resource technologies, as well as recognizes the need for protecting sensitive habitat and species in California, and supports a balanced approach to meet both objectives.

PG&E is also participating in California Transmission Planning Group, a multi-utility planning forum to coordinate utility transmission planning efforts to support the goal that any new transmission projects for delivery of renewable energy are sized appropriately to meet the needs of all load serving utilities in California. In addition, PG&E places high priority on upgrading existing transmission corridors as opposed to building new green field facilities with an eye to minimizing the footprint of new transmission.

As an active participant in the Solar PEIS review process, PG&E has previously provided comments on the Bureau of Land Management's (BLM) proposed Solar Energy Program in partnership with members of the California Desert and Renewable Energy Working Group (CDREWG). PG&E collaborated with the CDREWG to submit broad policy recommendations in a separate letter dated January 27, 2012.

I. Summary

The enclosed comments are intended to generally express PG&E's ongoing support for provisions of solar energy development siting flexibility as well as the need for implementing clear permitting incentives for developers to site projects within designated zones. We are supportive of a targeted and facilitated approach to siting projects in zones, such as the Solar Energy Zones (SEZs) proposed in the Draft Solar PEIS, combined with identifying and approving new SEZs in a timely manner and creating the proposed variance process to allow exceptional projects outside the zones.

We commend the BLM for incorporating stakeholder comments and feedback on the Draft Solar PEIS by refining SEZs to be carried forward into the Final PEIS, outlining a process for identifying new SEZs, including a description of the authorization process and incentives for projects in SEZs, outlining a variance process for developing projects outside of SEZs and specifying additional biological and cultural resources data and plans that could further facilitate development in SEZs. In particular, the newly proposed variance process for applications outside of SEZs will allow flexibility for developers to site exceptional, high potential, low environmental impact projects on appropriate lands outside of SEZs in the near-term until the necessary new SEZs are added to the Solar Energy Program. While we feel the variance process is necessary at this time for the reasons stated above, we look forward to a robust SEZ program that would be able to meet the goals of renewable energy development and resource conservation to the extent that requests to use the variance process are rare.

We recommend approval without delay of the Solar PEIS proposed Solar Energy Program in order to make available the agency resources that will be needed to identify, select and approve additional SEZs in California. As such, we urge the BLM to begin evaluating new SEZs immediately and in parallel to completion of the Solar PEIS.

II. New Solar Energy Zones and Coordination with the DRECP

PG&E commends the refinement and deletion of appropriate SEZs in the Supplement and BLM's simultaneous proposal of a new SEZ identification protocol. Because the remaining SEZs in California are not adequate to meet the Reasonably Foreseeable Development Scenario stated in the Supplement, the BLM should immediately work to identify new SEZs in California, with stakeholder involvement in a review process separate from the Solar Programmatic EIS.

As such, PG&E supports the highly coordinated integration of Solar PEIS SEZs and the renewable energy zones that are being evaluated in the Desert Renewable Energy Conservation Plan (DRECP), a habitat conservation plan (HCP) and a natural community conservation plan (NCCP). Recognizing that the planning processes for the Solar PEIS and the DRECP are on overlapping schedules, the two processes should be highly coordinated such that they present an integrated and consistent approach to guiding development toward appropriate locations within the southern California deserts. The DRECP should utilize SEZ identification protocol to identify lands appropriate for solar energy development. If the Solar PEIS is approved before the DRECP is completed, the Solar PEIS should allow expedited amendment for the addition of new SEZs on public lands that align with the DRECP findings. BLM should also provide a contingency method for expedited approval of zones under analysis for DRECP, even if the HCP/NCCP for the DRECP is not successfully completed as planned.

The Draft and Supplemental PEIS fail to consider recommendations for adoption of new SEZs in the West Mojave. The unique high insolation and biological values in this portion of the California Desert Conservation Area (CDCA) need strategic planning, investments in data collection and advance mitigation planning similar to the efforts outlined for SEZs. The BLM should incorporate stronger assurance that the DRECP will include outcomes supporting early identification of development zones and conservation strategies for the West Mojave so that this area is well-prepared for serious consideration as a new SEZ.

III. Transmission

PG&E is working collaboratively with key stakeholders both in California and across the nation to lay the foundation for a reliable transmission system that will—over time—provide core infrastructure for the delivery of clean and sustainable energy supplies.

New transmission lines are needed to accommodate new and anticipated renewable energy development. PG&E works with regulators, environmental organizations, government agencies and other stakeholders to support timely construction of transmission lines and permitting of proposed project sites. For example, PG&E has proposed the Midway-Gregg-Tesla Project that would move renewable power from southern and central California to PG&E's load in northern California. The Project is now being reviewed by the California Independent Systems Operator (CAISO) as part of its 2012-2013 Transmission Planning Process.

PG&E supports transmission development to accommodate interconnection and delivery of multiple resource areas to support a robust and competitive market for renewable resources. PG&E believes that greater transmission availability enables competitive markets by providing procurement options from multiple resource areas. Identification of SEZs and related transmission upgrades and additions will provide greater certainty and result in a more orderly, rational, timely, and cost-effective state and regional transmission planning and permitting process as well as result in the least impacts to biological resources.

PG&E has several suggestions regarding improvement to the transmission analysis in the Solar PEIS:

- Timing – The Riverside East and the Imperial East SEZs should be finalized and the process for creating new SEZs in California should be completed as soon as possible to allow CAISO to incorporate SEZ areas into their planning process as early as possible.

- Analysis of Transmission Capacity and Network Upgrades – The Solar PEIS should recognize the downstream upgrades and impacts to high voltage electrical transmission systems. The Solar PEIS should not assume that sufficient additional transmission capacity is available by simply upgrading existing lines. An analysis of existing transmission capacity is lacking in the Solar PEIS and is recommended for inclusion. The Solar PEIS should recognize that transmission network upgrades and additions will be needed to safely and reliably interconnect renewable energy resources from remote areas of the state to population centers. Although a majority of the direct transmission impacts from the Solar PEIS proposed policies and foreseeable development are located outside of PG&E's immediate service territory, some of our facilities may need to be upgraded to accommodate increased loads of power from concentrated solar energy development areas on BLM lands in southern California. For example, a Kramer – Midway transmission line may be needed to support delivery of the amount of power expected by the development anticipated in the Solar PEIS alternatives.

- Corridors – The Solar PEIS does not address the siting of new transmission lines needed within or adjacent to existing rights-of-way and utility corridors nor does it analyze the amount of new rights-of-way or corridors that might be needed to transmit energy into the load centers while adhering to the North American Electric Reliability Corporation (NERC) and Western Electricity Coordinating Council (WECC) reliability criteria. The transmission analysis within the Solar PEIS should include a discussion of the reliability of utilizing existing corridors for all necessary transmission lines, acknowledging transmission facilities standards. The Solar PEIS should facilitate contiguous corridor designation on public and private lands that serve SEZs or multiple projects. Inter- and Intra- State corridors should be seamless, consistent, sized strategically, and durable in term. Inclusion of transmission corridors in the Solar PEIS will ensure success of the SEZ approach. Efforts to streamline the transmission system infrastructure will facilitate development of environmentally responsible utility-scale renewable development in a timely fashion. Specifically, corridor designations in the West Mojave desert may be helpful. The BLM should prepare an evaluation of land and permitting impacts of new and potential upgraded transmission line corridors to deliver power from each SEZ under consideration while meeting the most current NERC and WECC reliability criteria. BLM should also facilitate expedited permitting including providing Federal nexus for Section 7 consultation for corridor projects that serve SEZs.

- Coordination – There should be increased coordination among BLM, state renewable energy policy makers and implementers (e.g., California Energy Commission [CEC], California Public Utilities Commission [CPUC], and Investor Owned Utilities [IOU]), and transmission planning policy makers and implementers (e.g., CPUC, CEC, IOUs, and the CAISO to facilitate solar development. In particular, site development should be closely coordinated with transmission development. For example, transmission line upgrades should be better coordinated such that their construction is completed as renewable projects come online. The BLM in coordination with the CAISO, CPUC, and IOUs should consider doing central planning for land, permitting, and transmission issues. We encourage the BLM to continue to engage with regional planning efforts, like WECC and others, to assist in identifying potential transmission corridors. We also encourage the BLM to coordinate with the CAISO's Revised Transmission Planning Process (RTPP) and seek to optimize the grid with technology diversification.

As stated above, the vast majority of the transmission upgrades and new transmission lines needed to achieve the objectives of the Solar Energy Program will occur outside of PG&E's service territory. Much of this work will occur within the service territory of Southern California Edison (SCE), and we take this opportunity to support the important points outlined in the comment letter submitted by SCE to the BLM on January 26, 2012. We concur with SCE's comments on the Supplement regarding treatment of transmission issues as well the shortcomings pointed out regarding the transmission analysis proposed for SEZs.

IV. Incentives

Section 2.2.2.2.3 of the Supplement provides information on incentives proposed by the BLM to make development in SEZs more attractive to industry, including transmission-related activities. We offer the following recommendations on the incentives proposed in the Supplement:

- The supplement includes incentives to facilitate faster and easier permitting in SEZs. The BLM should describe the methods that the agency will employ to adhere to strict schedules, such as increased staffing and specified timelines.
- The supplement states that the BLM may improve and facilitate mitigation through preparation of regional mitigation plans that will be presented in the Final EIS, and allowing developers to mitigate biological impacts through funding conservation priorities that are identified in a regional mitigation plan. This section is difficult to comment on since the mitigation is not provided and the conservation priorities are not identified, although this appears to outline a reasonable approach. We concur with the general principle on this subject which is stated in the January 27, 2012 comment letter from CDREWG stating that mitigation should be prioritized as "avoid first, then minimize, then restore, then offset." PG&E will continue working with other stakeholders in the CDRWEG to develop specific recommendations for mitigation.
- The supplement states that the BLM may facilitate the permitting of needed transmission to SEZs through including a more detailed evaluation of transmission needs and impacts for anticipated solar development in SEZs in the Final EIS, offering incentives to developers willing to build transmission to SEZs, committing BLM staff to engage in state transmission planning efforts, establishing cooperative agreements to facilitate permitting, and proposing to have the SEZs reviewed by the WECC. It is unclear how the BLM plans to integrate transmission considerations with state transmission permitting agencies such as the CPUC, and more development of this coordination would be helpful. For example, it would be helpful if BLM described the type of incentives that BLM offer to transmission developers. Also, this section is focused on transmission, but substation planning is a critical part of development and needs to be addressed in planning for renewable energy zones.
- New SEZs should be added to match overall renewable energy needs for the state, as driven by the Renewable Portfolio Standard and other state and federal mandates, and should clearly be shown as supporting public policy driven development. The amount of renewable energy needed should drive the amount of pre-permitted solar land added to new SEZs.

V. Exclusion Areas

Section 2.2.2.1 of the Supplement includes a modified list of proposed exclusions. The exclusion criteria adopted in the Solar PEIS needs to be sufficiently clear to ensure that areas unavailable for future solar development applications can be easily identified by agencies and the public and

that those areas can effectively be carried forward into future planning and implementation activities. The BLM should clarify this section in the following ways to provide greater certainty in the siting process for solar energy development projects:

- Avoid the use of vague language with regard to the Exclusion Criteria that is outlined in Table 2.2-1. Please refer to Attachment A of this letter for our detailed suggestions on this topic, and other specific comments on the Supplement.
- Provide detailed maps and data of exclusion areas to make compliance with these criteria straightforward. Mapped data would also facilitate timely agency evaluation. If exclusions will not be mapped for the Final PEIS, please indicate the size and scope of exclusion area acreages that could not be mapped and if they would exclude a significant portion of land within SEZs or currently shown as open to applications for development under the Preferred Alternative.
- Consider removal of solar insolation (number 2) from the list of exclusion criteria, especially for the variance process and identification of new zones. The BLM's Solar Energy Program should provide flexibility to accommodate a wide range of projects, particularly in a climate of rapidly changing technology. Exclusion area criteria should only include consideration of protecting environmental integrity, and new developments in solar energy technology may make current insolation needs an obsolete standard. Alternately, consideration should be given to the pilot program suggested in the January 27, 2012 joint comment letter from CDREWG in the section discussing the insolation criteria for exclusion.
- The PEIS should make clear that the exclusion areas apply only to renewable energy development and not necessarily to transmission line and appurtenant facilities (telecommunication, access roads, substations, etc.) needed to support the desired development.

VI. Definition and Processing Approach for New, Pending, and Approved Solar Projects

Section 1.7 of the Supplement describes how the BLM will process new and pending solar development applications. The document states that the BLM intends to continue to process all pending applications that meet due diligence and siting requirements under BLM's current policies and that all new applications will be subject to the Record of Decision (ROD) for the Solar PEIS. PG&E has power purchase agreements with some projects that are recognized as "Approved Solar Projects" according to Table 1.7-2 on page 1-13 of the Supplement and therefore would not be subject to the Solar PEIS ROD.

It is unclear how projects that are approved "but will require additional case-processing and environmental review to consider post-authorization requests to change technology" will be handled. Projects that have changed technology since being listed as "Approved Solar Projects" should not be subject to the Solar PEIS ROD, and if so, this should be clearly stated.

It is also unclear how projects located on private lands but requiring BLM right-of-way approvals for linear facilities that cross BLM jurisdiction would be affected by the Solar PEIS ROD. BLM should describe in the Solar PEIS the method by which projects proposed on non-BLM lands could take advantage of incentives offered to projects proposed on BLM land, such as priority right-of-way processing and expedited environmental review.

VII. Competitive Leasing Rulemaking

Section 1.8.2 of the Supplement describes the BLM's intentions to offer lands in SEZs through a competitive process. PG&E understands that BLM has decided to undertake rulemaking to establish a competitive process for offering public lands for solar as well as wind energy development. Finalization of the rulemaking process should be expedited and available with completion of the ROD to foster effective SEZ development. We recommend the following considerations during the rulemaking process in order to facilitate economical production of energy from solar resources:

- BLM should set appropriate terms for a competitive solar energy right-of-way lease. PG&E and other utilities are executing contracts with delivery terms of up to 25 years. The projects being built can be expected to operate for the term of the PPA, and potentially longer. The lease needs to be long enough for the developers to have assurance that they can build and operate their facility for its useful life, and not have the uncertainty of a potential lease termination mid-contract. This means the lease should be at least 30 years (to allow for construction of the project), or longer.
- On page 2-68, the Supplement states that the BLM has confirmed that it will offer lands within SEZs through a competitive process and would result in increased costs for developers of solar facilities. BLM should set a fixed price for land that would be consistent for all developers. Competition among developers in SEZs should be based on cost to build and operate renewable energy facilities, rather than ability to get land permitted. The BLM's competitive bid process should not result in an increase in the cost of electricity to consumers. Costs associated with renewable resources are already high and the PEIS should not take actions that further increase the cost of electricity to consumers, and thus work against public policy goals for clean energy development.

VIII. Comments on the Draft PEIS

PG&E submitted detailed comments on design features proposed in the Draft PEIS and understands that those comments will be addressed in the Final Solar PEIS. We respectfully resubmit our earlier comments on the design features for consideration (please see Attachment B – Specific Comments Previously Proposed on the Draft Solar PEIS).

We look forward to continuing to work with policymakers, regulators, and stakeholders to support California's renewable power goals while protecting land, water, and wildlife resources. In particular, PG&E reiterates support of the BLM, the DOE, and all stakeholders continuing to work collectively to improve the timing and efficiency of the permitting process for renewable energy projects on public lands. PG&E greatly appreciates your consideration of our comments.

Respectfully submitted,

Diane Ross-Leech

Enclosures:
Attachment A– Specific Comments on the Supplement to the Draft Solar PEIS
Attachment B – Specific Comments Previously Submitted on the Draft Solar PEIS

Attachment A – Specific Comments on the Supplement to the Draft Solar PEIS

No.	Topic	Chapter	Page	Line	Comment
	Exclusion Areas (Table 2.2-1)	2	2-16 2-17	4 11 13 14 29	Number 4: Same comment and previously written, "Proposed critical habitat was used as a factor to exclude lands. Proposed critical habitat is not protected under federal law, and because the listing of proposed critical habitat is extremely contentious, it is subject to significant change. Please indicate the frequency that exclusion areas will be updated based on legislative changes." We have reservations including proposed critical habitat in this criteria as these proposed areas may never become designated. Number 11: The BLM should avoid the use of vague language and provide clear, concise guidance for development. Please indicate the seasonal restrictions. Numbers 13 and 14: Big game ranges are often very large. Would projects with small footprints compared to the size of the range or corridor be subject to this criterion? Number 29: BLM should specify additional areas that may require exclusion would be determined. Can areas change depending on BLM staff? General comment: For all resources, buffer widths should be specified if required.
	Proposed Variance Areas: Desert Tortoise Variance Process Requirements Under Consideration	2	2-35	28-46	BLM should modify Option 2 to provide more clarity. As written, the option appears to be impossible to comply with because of the following concerns: What happens if more than 5 tortoises per square mile are located in the project area but they have a MCL of less than 160mm? Why is there is discrimination between class sizes? The requirement for pre-project surveys should be dependent on size of a site; there is a difference between a 1,500 acre site and a 160 acre site that is not reflected in the criteria. It is

No.	Topic	Chapter	Page	Line	Comment
					not clear how the connectivity buffer would work. What if the site was not 3 miles long, how would the connectivity buffer be sited? It would be helpful if BLM provided more specificity on option with regard to the above questions in the Final PEIS.
	C.2 California Proposed Solar Energy Zones - Imperial East and Riverside East	Appendix C Section C.2.1.5 and C.2.2.5			The Action Plans detailed in Section C.2.1.5 and C.2.2.5, Additional Data Collection Recommended, would make SEZs more effective but it would be more helpful if BLM provided the following information in this section: Who is responsible for collecting data specified in the action plans, the BLM or the Applicant? Much of the information reads like it is the responsibility of the BLM, while other information suggests data collection is to be conducted by the applicant. When is this information required? Is this just in support of the PEIS or is this information requested as part of the right-of-way application? How many of the items on the list can be accomplished in the short term?

Attachment B – Specific Comments Previously Submitted on the Draft Solar PEIS

No.	Topic	Chapter	Page	Line	Comment
23	Design Features	Appendix A	A-36	44-46	Please define "action." Some preconstruction activities could be permitted to occur prior to marking of property boundaries and PLSS.
24	Design Features	Appendix A	A-37	35-38	Please clarify how long is "recent" and whose responsibility would it be to conduct wilderness inventories. BLM should provide records of wilderness proposals that can be accessed by the public.
25	Design Features	Appendix A	A-39	13-14	Generally speaking, it is difficult to provide public access through a solar facility.
26	Design Features	Appendix A	A-39	16-17	Please clarify the definition of a unique or important recreation resource.
27	Design Features	Appendix A	A-39	19-23	Regarding replacement of acreage for off-highway vehicles, please clarify how secondary impacts associated with this mitigation would be evaluated.
28	Design Features	Appendix A	A-39	39-44	Regarding evaluating impacts from the solar energy facility in regards to the operation of existing military installations, please clarify how to quantify whether displacement of species onto their facilities was occurring.
29	Design Features	Appendix A	A-41	15 and general	There is a lot of discussion in the measures about "adequate" space and buffers from sensitive areas; however, please clarify how adequate is defined and the size of the buffer.
30	Design Features	Appendix A	A-41	39	Please indicate the recommendations for design of temporary roads.
31	Design Features	Appendix A	A-41	27	In some locations, it will be impossible to avoid existing desert washes when designing and building new roads.
32	Design Features	Appendix A	A-42	22-23	Minimization of ground-disturbing activities during the rainy season may not be feasible for large-scale solar facilities. The safety of the workers should also be taken into consideration, as work during the non-rainy season is extremely hot. Also, please

No.	Topic	Chapter	Page	Line	Comment
					clarify is this means winter/spring rainy season or monsoon season or both.
33	Design Features	Appendix A	A-42	39-40	We suggest providing examples of BMPs that would be acceptable in wildlife crossing areas.
34	Design Features	Appendix A	A-42	18	Water may not be the most appropriate dust stabilizer in desert environments.
35	Design Features	Appendix A	A-51	9-12	PEIS states that the EPA will ask for additional turbidity sampling. This does not apply in California.
36	Design Features	Appendix A	A-53	18 and general	"Special construction techniques" should be specified, here and in other design features.
37	Design Features	Appendix A	A-54	30 and general	The responsible party and frequency for "monitoring" proposed design features should be specified, here and throughout.
38	Design Features	Appendix A	A-55	Footnote 2	Note that USFWS Species of Concern are included in the list of special-status species; USFWS Species of Concern are not protected under the law.
39	Design Features	Appendix A	A-56	17-20	The measure states not to site projects in designated critical habitat. Please clarify if this applies to habitat that does not support the species and if a situation arises where there are no primary constituent elements present.
40	Design Features	Appendix A	A-57	1-2	Please indicate the recommended distance of siting facilities in proximity to open water or areas supporting large numbers of birds and clarify what is considered a "large number of birds".
41	Design Features	Appendix A	A-57	7	"Tall structures shall be located to avoid known flight paths of birds and bats." Please indicate the maximum allowable height.
42	Design Features	Appendix A	A-57	17-18	Fencing as described would not allow installation of wildlife-friendly four-inch gap that we are using on other sites to facilitate (San Joaquin kit fox) species movement.
43	Design Features	Appendix A	A-58	1-5, general	When design features state that facilities should be designed to minimize impacts, they should also state specific recommendations

No.	Topic	Chapter	Page	Line	Comment
					for minimizing impacts.
44	Design Features	Appendix A	A-59	21-22	Nesting buffers should also be established in conjunction with the state agencies. There are also situations where the biological monitor can determine an appropriate nesting buffer without consultation with agencies.
45	Design Features	Appendix A	A-65	7-13	Please assure that agencies have time to attend the seasonally appropriate walkthroughs.
46	Design Features	Appendix A	A-66, 67	45-46,1-4	Please indicate why we need to consult with the agencies if active nests are not detected.
47	Design Features	Appendix A	A-68	6-8	Please indicate the timeframes for "immediate" revegetation.
48	Design Features	Appendix A	A-70	23-24	Pleas indicate the metric used to determine whether revegetation is "similar" to pre-construction conditions.
49	Design Features	Appendix A	A-71	37-38	Confirm that tree cutting is not in conflict with CPUC General Order 95.
50	Design Features	Appendix A	A-71	42-43	Use of helicopters can have significant impacts on air quality.
51	Design Features	Appendix A	A-72	29,39	Removal of raven's nests from transmission towers is likely not a CDFG-approved activity. Please indicate whose responsibility it would be to conduct nest removal activities.
52	Design Features	Appendix A	A-77 to 79		Design Features for Visual Resources indicate a need to conduct early visual studies to evaluate impacts to development during the siting process, a timely and economically intensive activity not typically conducted until further along in the development phase after a site has been selected.
53	Design Features	Appendix A	A-81	18-21	Add "if feasible" in regards to transmission line/pipeline routing
	Design Features	Appendix A	A-82	24-26	

No.	Topic	Chapter	Page	Line	Comment
54	Design Features	Appendix A	A-89	22-42	Please indicate the methodology for off-site mitigation of visual impacts – and how equal magnitudes are determined for mitigation.
55	Design Features	Appendix A	A-90	6-11	Noise monitoring should not be necessary if there are no sensitive receptors nearby.
56	Design Features	Appendix A	A-90, A-91	14, 4, 26, 43	"Nearby" is used in mitigation measure but not defined
57	SEZ Design Features	Appendix A	A-116	General	With implementation of design features, it would be beneficial for BLM to quantify the amount of SEZs are available for development and how many acres are precluded from development based on the design features listed.
58	SEZ Design Features	Appendix A	A-116 to 119	Imperial East SEZ	The design features for this SEZ list the following areas as off-limits to development: desert washes, wetlands in the western and southern portions of the SEZ, sand dunes in the northern and eastern portion of the SEZ, areas near the All American Canal. Surveys and tribal consultation would be required for potential burial sites. USFWS consultation and surveys would also be needed for specified wildlife and plants. Design features would be improved if more specific information is provided about the specific areas that should be avoided, including quantified and mapped locations, and specific buffer distances should be recommended.
59	SEZ Design Features	Appendix A	A-116 to 119	Iron Mountain SEZ	Similar comment to above, Design features would be improved if more specific information is provided about the specific areas that should be avoided, including quantified and mapped locations, and specific buffer distances should be recommended. This SEZ seems to have a considerable amount of lands off limits to development: KSLA, sand and gravel areas, Danby Lake (25,000 acres), Colorado River Aqueduct, Homer Wash, dunes, unique habitats (e.g. dry wash), and historical sites. Surveys and tribal consultation would be required for potential burial sites. USFWS consultation and surveys would also be needed for specified wildlife and plants.

No.	Topic	Chapter	Page	Line	Comment
60	SEZ Design Features	Appendix A	A- 119 to 128	Riverside East SEZ	Similar comment to above, Design features would be improved if more specific information is provided about the specific areas that should be avoided, including quantified and mapped locations, and specific buffer distances should be recommended.
61	SEZ Design Features	Appendix A	general		The PEIS should present a comprehensive Map that shows all areas that should be avoided or are precluded from development within each SEZ.
62	California Transmission Planning Activities	Appendix D	Section D.3, Page D-21 to D-30		Section D.3.2 describes the California Renewable Energy Transmission Initiative (RETI) and Section D.3.3 describes the California Transmission Planning Group (CTPG). The RETI has concluded its work, and PG&E will continue to follow up and participate in the CTPG and other joint planning processes to shape and influence the new renewable transmission lines that would bring power out from the four California SEZs.
63	Transmission	Appendix G	G-1	26-28	"This transmission analysis only considered the locations of existing transmission lines and designated corridors and did not look at the available capacity on existing lines (i.e., the analysis assumed lines could be upgraded, if needed)." – This assumption is inadequate and should be reevaluated because upgrades to transmission lines are not easily accomplished and may not be feasible.
64	Transmission	Appendix G	G-3	41	The document states "approximately 35 lines planned for California..." The PEIS should provide a table of the planned lines.
65	Transmission	Appendix G	G-8	Figure G-3	The map resolution in the figure showing transmission lines and corridors is too vague and the proposed lines cannot be seen clearly. It would be great if the report provided a map per state and provide greater resolution.

Thank you for your comment, Raymond Hiemstra.

The comment tracking number that has been assigned to your comment is SEDDsupp20140.

Comment Date: January 27, 2012 16:38:15PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20140

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Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

I support the use of zoning for for the permitting of solar facilities. There is plenty of land available for solar facilities using only the zones proposed for solar use in the draft plan. Solar facilites should not be built in areas that are outside of the proposed zones except on private property.

Thank you for your comment, Ian Black.

The comment tracking number that has been assigned to your comment is SEDDsupp20141.

Comment Date: January 27, 2012 16:48:03PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20141

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Attachment: enXco SDPEIS Comment Letter 27 Jan 2012 Final.pdf

Comment Submitted:

27 January 2012

U.S. MAIL & INTERNET FORM

Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue, EVS/240
Argonne, IL 60439

Re: Comments of enXco, Inc. on the Supplement to the Draft Solar Programmatic Environmental Impact Statement

To whom it may concern:

Thank you for the opportunity to comment on the Supplement (SDPEIS) to the Solar Energy Development Draft Programmatic Environmental Impact Statement (PEIS) prepared by the U.S. Department of Energy, Energy Efficiency and Renewable Energy Program (DOE) and the U.S. Department of the Interior, Bureau of Land Management (BLM) pursuant to the National Environmental Policy Act (NEPA).

enXco, Inc. is one of the oldest and largest full service renewable energy companies in the United States, with more than two decades of experience. enXco undertakes three core activities: development, operations and maintenance, and asset management services. Since 2002, enXco has been an affiliate of EDF Energies Nouvelles, a French company that specializes in renewable energy with a gross installed capacity of over 3,805 megawatts (MW) worldwide.

enXco's development team has successfully developed projects for clients such as Xcel, MidAmerican, PG&E and SDG&E. To date, enXco has developed nearly 2,000 MW of wind projects and has 89 MW of solar photovoltaic (PV) capacity in operation or under construction in the United States and Canada. enXco has multiple solar PV projects under application on BLM-administered lands.

enXco headquarters are located in San Diego, California, with regional development offices in Minneapolis, Minnesota; San Ramon, California; Portland, Oregon; and Denver, Colorado. enXco also operates a state-of-the-art Operations Control Center in Chandler, Minnesota, monitoring nearly 3,000 turbines across the nation. The company has over 800 employees located in 17 states.

1. Introduction and Summary of Comments

In this letter, enXco has chosen to focus its comments on areas which are of particular relevance to its own projects, namely, the pending projects exemption and certain new restrictions

proposed within the Riverside East and Dry Lake SEZs. Those comments are detailed in the pages below.

However, there are a series of other concerns enXco shares with most if not all of its industry peers regarding other aspects of the SDPEIS, which are separately addressed by the comments of the solar trade organizations to which we belong. Specifically, enXco favors the BLM-preferred Modified Solar Energy Development Program Alternative of the SDPEIS over its Modified SEZ Program Alternative. enXco shares industry concerns over the proposed variance determination process as well, which in our opinion should be driven by consideration of BLM's existing "conflict" criteria of Instruction Memorandum 2011-061, rather than by the criteria proposed in the SDPEIS, which would greatly reduce the likelihood of ever obtaining a variance approval. We also favor addressing desert tortoise impacts on a case-by-case basis instead of by prescriptive quantitative criteria and connectivity maps that appear to have little foundation in existing studies and that, in any event, are likely to change far too frequently to be hard-wired into such a high-level program. Finally, we believe the creation of new SEZs should occur more often than every five years, with a clear right for developers to propose new SEZs outside of regional efforts such as the Desert Renewable Energy Conservation Plan.

2. Pending Applications

The SDPEIS states that pending applications will be subject to "continued processing under existing policies,"[1] including the February 2011 Instruction Memoranda (Nos. 2011-059 to 2011-061). enXco supports the exclusion of pending applications from the terms of the PEIS and its Record of Decision (ROD). However, the SDPEIS does not clearly state the pending projects exemption and some provisions actually contradict it. enXco therefore respectfully requests the following clarifications.

a. Clarify ambiguous language

The SDPEIS states that pending projects will continue to be processed under "existing regulations and policies." However, the PEIS will itself become "existing policy" upon issuance of its ROD. enXco therefore recommends:

- clearly defining "existing regulations and policy" to mean regulations and policies in effect prior to adoption of the PEIS ROD; and

[1] Table 1.7-1, page 1-9.

- adding language to the PEIS and its ROD expressly stating that pending projects are not subject to the PEIS before or after issuance of its ROD, and will instead be processed as though the "no action" alternative had been adopted.

To avoid similar confusion, enXco also recommends qualifying the following provision, "The ROD for the Solar PEIS will recognize all previously approved solar projects"[2] by adding the following clause: "and will expressly exclude pending projects from its terms."

b. Delete express contradictions and modify implicit contradictions

Some language in the SDPEIS contradicts the pending projects exemption and should be deleted. For example, the following provision assumes the PEIS ROD would apply to pending projects:

> Pending applications on lands proposed as exclusion areas for utility-scale solar energy development in the Final Solar PEIS are likely candidates for denial. Upon issuance of the Solar PEIS ROD, the BLM may deny pending applications to the extent such applications overlap with exclusion areas identified in the ROD for the protection of ecological, cultural, visual, or other specified resource values.[3]

enXco recommends deletion of this language because it undermines the pending projects exemption. FLPMA, the 43 C.F.R. Part 2800 regulations, and BLM's February 2011 Instruction Memoranda already provide BLM with the tools it needs to reject pending applications.

Other provisions of the SDPEIS contradict the pending projects exemption by implication. For example, by stating that the BLM may deny pending applications *before* adoption of the PEIS, the following statement creates a presumption that the PEIS will apply to pending projects *after* its adoption: "The BLM may decide to deny pending solar applications before completion of the Solar PEIS ROD if the BLM has a supportable, rational basis."[4] enXco therefore requests replacement of this sentence with the following: "Although BLM will not apply the Solar PEIS to pending solar applications, the BLM still may decide to deny pending solar applications if the BLM has a supportable, rational basis on other grounds."

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[2] Page 1-12, line 18.
[3] Page 1-11, lines 14-18.
[4] Page 1-10, lines 24-25.

c. Specify how to implement the pending projects exemption

Although the pending projects exemption is a clear concept, its application is less clear, particularly with regard to substantive resource matters. Because the PEIS is a prospective document intended to regulate and facilitate solar development applications submitted after 30 June 2009, enXco recommends the following additions to the SDPEIS to ensure proper implementation:

- language stating that the PEIS maps do not apply to approved or pending project sites unless the approved project is cancelled or the pending project application is withdrawn or rejected. We recommend overlaying approved and pending project boundaries on each of the PEIS maps with a legend item summarizing this concept.

- language stating that neither the maps nor the resource determinations of the PEIS are to inform pending project NEPA analyses, which shall instead independently assess project-specific resource issues on a case-by-case basis.

3. New SEZ Restrictions and Boundary Changes

a. New Riverside East SEZ restrictions and designations

enXco respectfully requests reconsideration of several new restrictions and designations within the Riverside East SEZ.

i. Height restrictions

enXco's 2 May 2011 comment letter on the Draft PEIS discussed at length why the proposed Visual Resource Management (VRM) designations for the Riverside East SEZ are too stringent. The new VRM design features proposed in the SDPEIS also go too far.

Limiting all development within VRM Class II lands, and all solar development within VRM Class III lands, to 10 feet or less[5] would result in unintended adverse consequences without appreciably reducing visual impacts. The design feature would prohibit more efficient tracking PV technologies (which can reach heights of 7.5 meters (25 feet)), resulting in larger project footprints and a corresponding increase in environmental impacts. Moreover, the roughly 15-foot height difference between fixed and tracking PV technologies does not appreciably alter

[5] Page C-58, lines 13-19.

visual resource impacts, particularly when they are viewed from a distance or from above, as in the case of Joshua Tree National Park. Such issues should be addressed on a case-by-case basis instead.

The same holds for another newly proposed design feature requiring the undergrounding of transmission lines in all VRM Class II lands.[6] Undergrounding of transmission lines is often suggested as a form of visual mitigation. But the practice is frequently rendered infeasible by the greater biological, cultural, air quality and noise impacts of construction, the difficulty of access for maintenance, and the roughly 8- to 9-fold additional expense, as the BLM has itself concluded with regard to the Desert Sunlight project. Please refer to the Desert Sunlight ROD, attached hereto as Exhibit A, for a full explication of the infeasibility of undergrounding transmission lines within the Riverside East SEZ. Instead, a programmatic design feature requiring the co-location of transmission lines on the same poles where feasible would be a better solution, as proposed in enXco's 2 May 2011 comment letter on the Draft PEIS.

Finally, limiting all vertical structures to 100 feet or less within VRM Class II and III lands presents significant engineering challenges when conducting voltages as high as those generated by utility-scale solar projects. In many cases a 100-foot limit would be infeasible. Because such limitations vary by project, enXco recommends replacing the 100-foot limitation with a case-by-case standard based on minimum high-voltage engineering standards.

ii. Undevelopable streambeds

Figure C.2.2-2 of the SDPEIS depicts a streambed within the pending Desert Harvest project and the McCoy Wash as "undevelopable," without any justification. However, the wash on the Desert Harvest project site has already been stemmed by a berm constructed along the southern boundary of the approved Desert Sunlight project and no longer flows through the Desert Harvest project site. The designation therefore should be removed.

Categorically prohibiting development over the McCoy wash is overly restrictive. The McCoy Wash is subject to the jurisdiction of the California Department of Game and the U.S. Army Corps of Engineers, agencies that have well-developed regulatory programs for the comprehensive management of jurisdictional streams. Whether development should be allowed to occur across a portion of the McCoy Wash and how it should be mitigated should instead depend on the specific resources associated with the stream as they relate to a given project's site

[6] Page C-344, lines 6-10.

plan, as determined by that project's NEPA review and by the CDFG and the U.S. Army Corps of Engineers.

iii. Wilderness Characteristics

Figure C.2.2-3 of the SDPEIS depicts approximately 11,925 acres of the eastern side of the Riverside East SEZ as having wilderness characteristics based on a 2011 wilderness inventory that is not included in the SDPEIS. enXco questions this designation in light of its apparent departure from the 2010 VRI Class III designation of the same lands and the DPEIS' corresponding proposal not to manage the lands under VRM Class II or III. We also question whether the lands really can be deemed to embody the "naturalness[] and outstanding opportunities for either solitude or primitive and unconfined recreation"[7] required of wilderness when the lands lie in such close proximity to the approved Blythe Solar project, the Blythe Airport and the Town of Blythe.

If the designation remains, however, we recommend that the wilderness characteristics lands identified within the Riverside East SEZ be managed to allow solar development without further restrictions beyond those already identified in the Draft PEIS. A wilderness characteristics designation is an inventory decision, not a management decision. As BLM's own guidance recognizes, a land use plan may "emphasiz[e] other multiple uses as a priority over protecting wilderness characteristics."[8]

Page C-76 the SDPEIS states that, as a result of the new wilderness characteristics designation, "additional analysis of the visual values of these areas may be needed to determine if adjustments to the SEZ-specific mitigation identified in the Draft Solar PEIS are warranted." If the additional visual analysis results in a conclusion that the areas should be designated as "VRM Class II or III consistent," stringent and prohibitively costly visual resource mitigation requirements would apply to this area. Solar energy resource values and uses would be forgone or adversely affected as a consequence, which speaks directly to one of four important factors to consider when deciding whether to prioritize other uses as a priority over wilderness characteristics.[9]

The solar energy resource value of the SEZ lands in question is clear. The Riverside SEZ identifies BLM-administered lands best suited for solar development, based on both energy and

[7] IM No. 2011-154, (25 July 2011); Attachment 1, pp. 4-8.
[8] IM No. 2011-154, (25 July 2011); Attachment 2, p. 1.
[9] IM No. 2011-153 (25 July 2011); Attachment 2, p. 2.

environmental considerations, and refined through public comment after publication in the Federal Register.[10] As such, it is a concrete manifestation of the national energy priorities expressed in the Energy Policy Act of 2005, Executive Order 13212, and Secretarial Order 3285A1. Since its identification, the Riverside East SEZ has already been reduced by 23 percent, with a substantial portion of the remainder subject to exceedingly stringent visual VRM Class II and Class III resource management design standards, even though there is a general consensus among both industry and conservationist groups that it is an appropriate area for solar development. Further reductions or restrictions within arguably the most important of all the SEZs (and perhaps the only remaining SEZ large enough to accommodate multiple projects) run the real risk of undermining the national energy priorities the SEZ embodies. We therefore recommend against further restricting development in the Riverside East SEZ on the basis of the 2011 wilderness characteristics inventory. This approach is consistent with BLM's wilderness characteristics guidance. Moreover, BLM could offset the management decision by prohibiting development in the adjacent wilderness characteristics lands lying outside the SEZ, as identified by the same inventory.

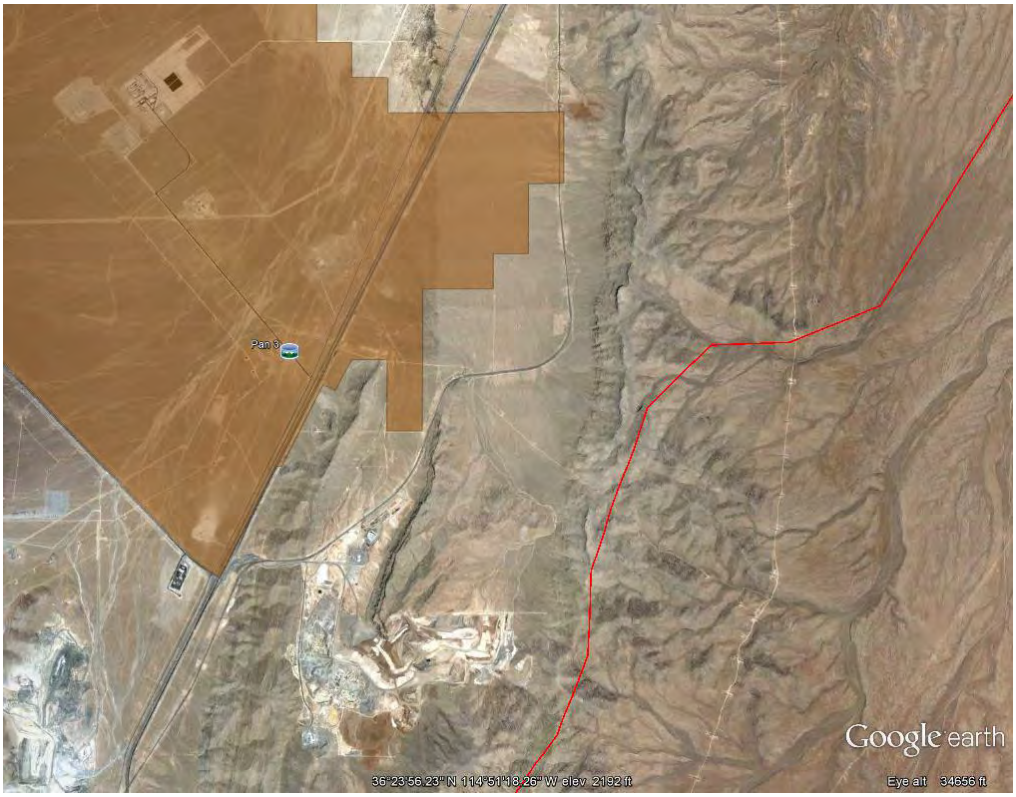
b. Dry Lake SEZ Boundary Change

The SDPEIS proposes removing the portion of the Dry Lake SEZ lying southeast of I-15 due to concerns regarding potential impacts to the Old Spanish National Historical Trail.[11] However, as the KMZ files for the Draft PEIS attest, this portion of the originally proposed Dry Lake SEZ is almost entirely screened from the Old Spanish National Historical Trail by an intervening ridge of the Dry Lake Range (See Figure 1, below). In addition, the trail turns east and away from the SEZ at approximately the same point it reaches the portion of the original SEZ lying southeast of I-15. Moreover, if a viewer follows the trail at ground level on Google Earth, the few mountain-top locations along the trail where the SEZ can be viewed reveal the SEZ lands *west* of the I-15; lands to the east of the I-15 for the most part remain obscured from view due to their close proximity to the base of the intervening ridge. Figures 2 and 3 below illustrate this effect by showing where the trail is visible (in red) from the I-15 (Figure 2) and from the eastern edge of the original SEZ (Figure 3). Because the lands east of I-15 for the most part cannot be seen from the Old Spanish National Historical Trail (and in fact appear to be less visible than the rest of the SEZ), enXco requests their reincorporation into the Dry Lake SEZ.

[10] 74 FR 31307.
[11] C-169, lines 24-27.

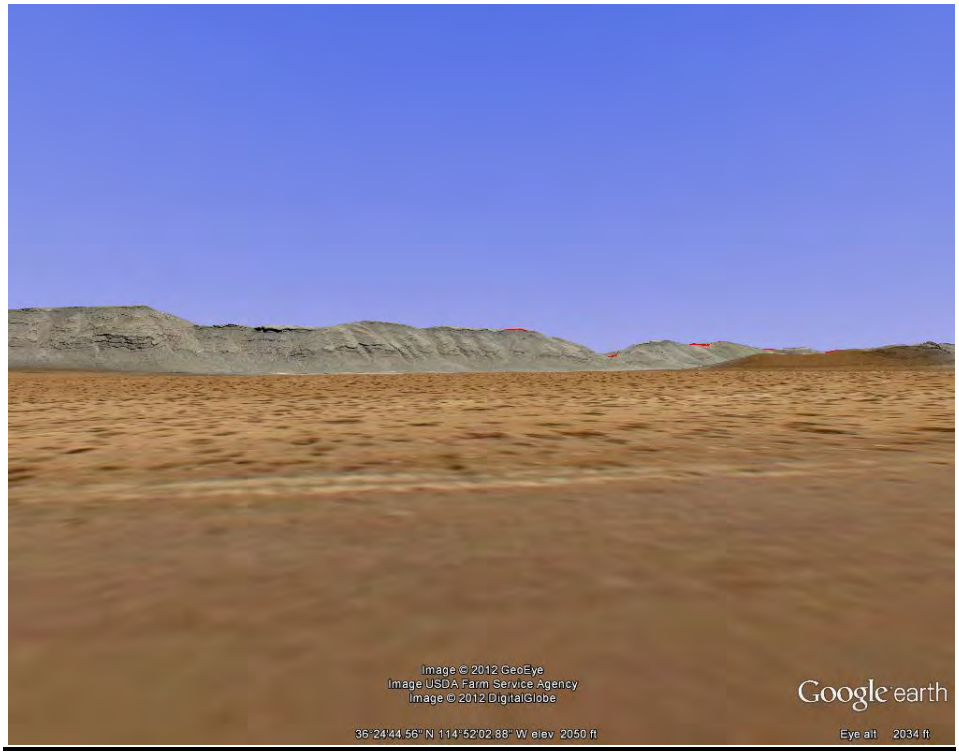
Figure 1

Originally Proposed Dry Lake SEZ and Old Spanish National Trail



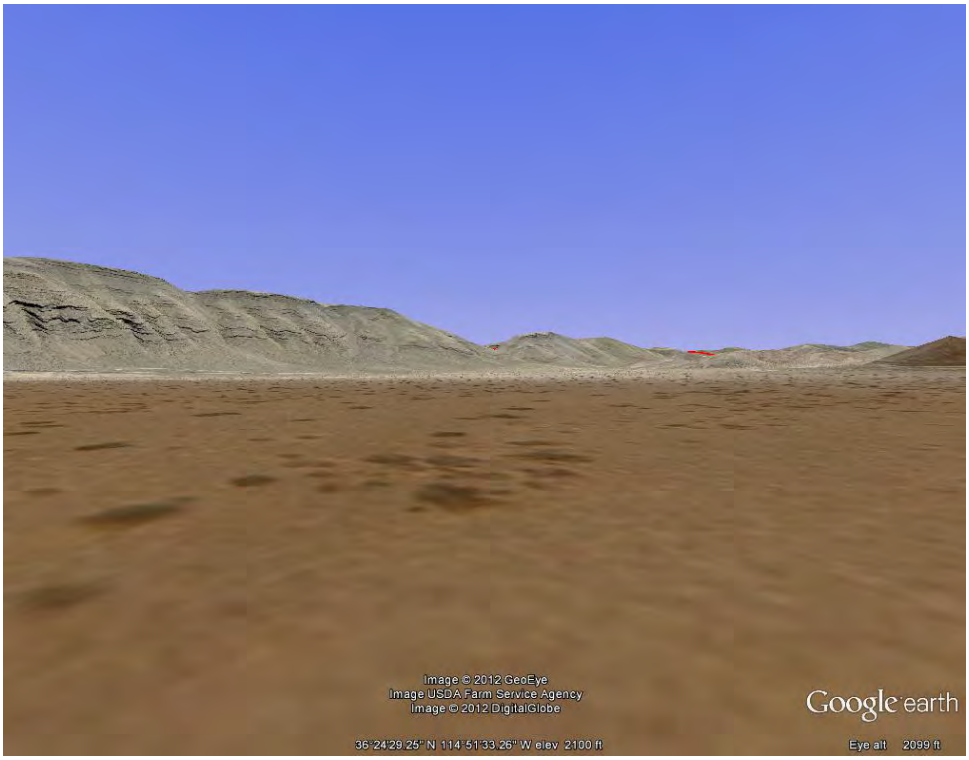
Source: Draft PEIS KMZ Files.

Figure 2
Example of Old Spanish National Trail Segments Visible from I-15



Source: Draft PEIS KMZ Files.

Figure 3
Example of Old Spanish National Trail Segments Visible from
Eastern Edge of Original Dry Lake SEZ



Source: Draft PEIS KMZ Files.

4. Conclusion

enXco sincerely appreciates the efforts of BLM and DOE to promote environmentally responsible solar energy development of BLM-administered lands through the PEIS process. The important modifications we have discussed above will ensure that the PEIS meets the mandates of the Energy Policy Act of 2005, Executive Order 13212, and Secretarial Order 3285A1 by expediting and prioritizing solar development without compromising environmental values, a balance which the multiple use mandate of FLPMA is ideally suited to strike.

Thank you for your time and consideration.

Sincerely,

Ian Black // acb

Ian Black
Solar Development
enXco - an EDF Energies Nouvelles Company

Enclosures

Exhibit A: Feasibility of Undergrounding Transmission Lines

Exhibit A

Feasibility of Undergrounding Transmission Lines

33 percent RPS deadline in 2020. There would have to be a significant acceleration of installation of both distributed and non-distributed generation to meet the goals defined in California's RPS. Large-scale projects play an important role in meeting these goals.

Conclusion. A distributed solar alternative was eliminated from detailed discussion because it does not respond to the BLM's purpose and need for the Proposed Action, which is to respond to Desert Sunlight's application for a ROW grant to construct, operate, and decommission a sPV facility on public lands in compliance with FLPMA, BLM ROW regulations, and other federal applicable laws. Additionally, the Energy Policy Act of 2005 established a goal for the Secretary of the Interior to approve 10,000 MW of non-hydropower renewable energy projects located on public lands. The Act reflects Congress's conclusion that installation of renewable energy technologies on public lands capable of producing at least 10,000 MW is appropriate. Given the current state of the technology, only utility-scale renewable energy generation projects are reasonable alternatives to achieve this level of renewable energy generation on public lands. Furthermore, the BLM has no authority or influence over the installation of distributed generation systems, other than on its own lands.

4.2.9 Underground Installation of Gen-Tie Lines

Underground transmission lines at 230 kV have been installed or are planned to be installed in California by Pacific Gas & Electric Company (its Northeast San Jose, Tri-Valley, and Jefferson-Martin Projects) and by San Diego Gas & Electric Company (its approved Otay Mesa and Sunrise Powerlink Projects). These lines, or portions of them, have been installed underground either due to congested urban areas where there is inadequate space for overhead high voltage lines, or (in the case of Tri-Valley and Jefferson-Martin) to reduce visual impacts in scenic areas.

While underground lines would reduce the visual effects of the transmission lines, they have several disadvantages with respect to their environmental impacts. The impacts are driven mostly by construction disturbance. The construction of underground transmission lines requires substantial ground disturbance to install the trench and cables. The least amount of disturbance would occur when installing the gen-tie line within a paved roadway. However, when adding the lengths of all three gen-tie line alternatives, there are only approximately 6 miles out of a total of approximately 30 miles that would fall within a paved roadway. The remaining 24 miles would be within a dirt road or undisturbed desert.

The trench for a 230-kV line could vary from about 3 feet to 6 feet wide depending on the configuration of the cables within the trench. A construction work area from 25 to 50 feet wide is required parallel to the trench for construction equipment, resulting in temporary disturbance to habitat. In unpaved areas, the area above the trench (generally a 20 or 25-foot-wide road) would have to remain clear and accessible for the life of the project, a permanent loss of habitat.

In addition, First Solar provided a report entitled "Gen-Tie Undergrounding Report; Desert Sunlight Solar Farm Project" (First Solar, 2011), which summarized underground installations in the U.S. and presented potential design for the underground gen-tie. The report also listed additional concerns, including the potential for third-party construction damage to the buried facilities, concerns about additional time required to repair the line in the event of an outage, and

limitations on expansion for future additional lines. Cost is also a major concern to the developer, since construction of underground transmission lines costs up to 8.5 times more than overhead lines. These increased costs negatively affect the Project's financial viability, especially when coupled with the considerable technical and environmental risks involved with underground transmission line design.

The First Solar report presents a concern about underground lines: that expansion of the capacity of a transmission line, or addition of future circuits, would be more difficult. The report also explains that the addition of future circuits could be accommodated by increasing cable spacing or constructing a larger duct bank (leaving empty spaces for future cables), or by construction of a parallel duct bank separated by an adequate distance to allow heat dissipation. These approaches would also increase construction cost.

Underground transmission lines are less accessible than overhead lines, so line maintenance is more challenging. It is more difficult to know where an outage has occurred, so outages of an underground line can be more time-consuming both to find the problem and to repair it.

Conclusion. BLM and the CPUC have evaluated the information included in First Solar's report and have determined that, based on the Agencies' own experience, expertise and research, undergrounding DSSF's Gen-Tie Lines would be infeasible. Although the technology for underground transmission lines is available and has been used to reduce visual impacts and to avoid overhead construction through congested areas by major utilities in California, the increased environmental impacts that would result in other resource areas does not justify the use of undergrounding in this case. Specifically, the lack of adequate paved roadways for installation of the Gen-Tie Lines serving the DSSF would result in substantially greater impacts in biological resources, cultural resources, air quality, and noise than for the overhead gen-ties. The additional costs and technical risks associated with undergrounding also make it undesirable under these conditions. As a result, the underground gen-tie alternative has been eliminated from detailed consideration.

~~4.3 Environmentally Preferred Alternative~~

~~The environmentally preferred alternative would be the No Project Alternative with Plan Amendment to Identify the Area as Unsuitable for Solar Development (Alternative 5). This alternative would not allow development of the proposed project or other solar energy generating projects and would have no impacts on the ground within the Project Study Area. However, this alternative would not allow the development of renewable energy, which is a national priority. As such, this alternative was not chosen in full by the BLM, rather, a portion of the alternative was approved which made the remainder of the Project Study Area unavailable to solar development due to resource conflict.~~

~~4.4 Agency Preferred Alternative / Selected Alternative~~

~~The BLM's preferred alternative is the Proposed Action Alternative with Land Use Plan Amendment (Alternative 1) – SF-B, GT-A-1, and Substation A with Access Road 2; or~~

Thank you for your comment, Elizabeth Cross.

The comment tracking number that has been assigned to your comment is SEDDsupp20142.

Comment Date: January 27, 2012 16:56:11PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20142

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Last Name: Cross
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Country:
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Please PLEASE do NOT open up ANY public lands to PRIVATE for profit corporations for solar development. There are other ways to make the needed switch to sustainable energy resources.

Thank you!

Thank you for your comment, Steve Saway.

The comment tracking number that has been assigned to your comment is SEDDsupp20143.

Comment Date: January 27, 2012 17:12:56PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20143

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Attachment: Solar PEIS January 27 comment letter.docx

Comment Submitted:

January 27, 2012

533 Suffolk Drive
Sierra Vista, AZ 85635

Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue
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Argonne, IL 60439

Dear Sir:

I have reviewed the Supplement to the Draft Solar Programmatic Environmental Impact Statement (PEIS) and offer the following comments.

1. Since the Solar PEIS process began, I have participated in each opportunity for public comment. I wish to refer back to my previous comments submitted on July 14, 2008; July 8, 2009; September 14, 2009; and May 2, 2011. I stand by the concerns and suggestions included in those documents and believe they are still largely relevant to this stage of the process. In this letter, I will highlight some specific concerns and bring forward some new information for your consideration.

2. The Supplement identifies the preferred alternative as the Modified Solar Energy Development Program Alternative. This alternative provides flexibility to identify additional solar energy zones (SEZs) and allows for utility scale solar development in variance areas outside of SEZs. I concur with the proposed protocol for identifying new SEZs (section 2.2.2.2.5) and the intent to use the Arizona RDEP process for identifying new or expanded SEZs. It should be noted that the RDEP's emphasis on use of previously disturbed lands has been well received and should result in less controversy and conflict with other public land values. Regarding the selection of variance areas outside of SEZs, I believe this is best done at the state and field office level, not at the national Solar PEIS level. For example, in Figure 2.3-1, the Supplement identifies about 3.4 million acres of Arizona BLM lands available for solar application outside of SEZs for the Modified Solar Development Program. However, of these lands, a large portion (west and southwest of the Gillespie SEZ) has been identified in the Lower Sonoran Draft Resource Management Plan (RMP) as avoidance areas for utility scale renewable energy development, i.e., these are high and moderate sensitivity areas (please refer to Map 2-7e, Alternative E, Utility Scale Renewable Energy Conflict Areas, in the Draft RMP). See also Appendix N, Analysis for Renewable Energy Sensitivity, in the Draft RMP. Info on the Draft RMP is available at this link: http://www.blm.gov/az/st/en/fo/lower_sonoran_field.html. Thus, I recommend the BLM rely on the Arizona RDEP to identify appropriate variance areas outside of SEZs. The Arizona RDEP process not only looks at

previously disturbed lands, but also looks across multiple jurisdictions and could result in a broader range of suitable lands for solar energy development. Conceivably, it could facilitate joint agreements between the BLM and Arizona State Land Department for solar development on BLM and State Trust Lands that are adjacent to each other.

3. Regarding the Supplement, Table 2.2-1 (Revised Areas for Exclusion under the BLM's Modified Solar Energy Development Program), I believe additional exclusion areas should be identified as follows: (a) High Value Recreation Settings; (b) Transportation and Public Access Routes; (c) Areas of Known Mineral Deposits, and (d) High Value Conservation Lands. This is particularly important since BLM will use incentives to steer developers to use the SEZs, thus making it critical that exclusion areas are properly identified to avoid conflicts with other public land uses and values. Also, item 29 in Table 2.2-1 could be revised as follows to allow greater flexibility to identify exclusion areas: Individual additional areas identified by BLM State or field offices as requiring exclusion due to ecological, conservation, cultural, mineral, recreational, or public access concerns. In my view, a good example of Arizona BLM lands that should qualify for exclusion are those identified at this link: http://www.sonoranheritage.org/.

4. In my previous comments, I identified concerns with the location and impacts of the Gillespie SEZ. The recent release of the Lower Sonoran Draft RMP offers additional reasons to reconsider the Gillespie SEZ. They are: (1) the location of this SEZ is within lands identified as avoidance areas for utility scale renewable energy development (see Map 2-7e cited in para 2 above); (2) the SEZ is located within a proposed Special Recreation Management Area (see Map 2-12e, Alternative E, Recreation Management); and (3) the SEZ is located on and adjacent to the proposed Agua Caliente Back Country Byway, (see Map 2-16e, Alternative E, Special Designations). (Please see also Appendix N, Analysis for Renewable Energy Sensitivity, in the Draft RMP.) In the Supplement, Table 2.2-1 (Revised Areas for Exclusion under the BLM's Modified Solar Energy Development Program) indicates that SEZs would be excluded from Special Recreation Management Areas and National Back Country Byways. It should also be noted that Appendix C (section C.2.1 Gillespie) in the Supplement identifies a significant number of adverse impacts of the Gillespie SEZ, including the following: "Inventoried off-highway vehicle routes in the SEZ would be closed to recreational use; there could be a loss of recreational use in the nearby WAs and SRMA." The potential closure of Agua Caliente Road and other inventoried routes is a major concern of mine. I belong to a hiking club that enjoys hiking and camping in the BLM lands south and west of the Gillespie SEZ, including the Woolsey Peak and Signal Peak Wilderness Areas (which are components of the National Landscape Conservation System). It is critical that public access is retained along Agua Caliente Road and along these inventoried routes, as they are the primary access routes to these wilderness areas. These routes are also important for the grazing permittee to access lands within grazing allotments that lie south of Agua Caliente Road. The Appendix C does not specifically address mitigation measures for potential loss of these access routes,

but it should. Agua Caliente Road is an improved county road that provides critical access to BLM lands and private property along its 49 miles. Please see my comment letters of May 2, 2011 and September 14, 2009, which identified key access routes that must remain open for public access. Appendix C is silent on any mitigation measures to ensure continued public access along these routes, and frankly, this appears to trivialize the public's need for access and recreational use in this area.

5. In summary, I would like to offer the following suggestions regarding the Gillespie SEZ:

a. Delete the Gillespie SEZ from further consideration based on its inconsistency and incompatibility with the Lower Sonoran Draft RMP (including its inconsistency with stated exclusion areas identified by the Supplement) and based on the numerous concerns and adverse impacts identified by public comments. Development of infrastructure in this area will affect the integrity and scenic values of the landscape, degrade the view shed of nearby wilderness areas and the Sonoran Desert National Monument, fragment open space and wildlife corridors, create more risk of invasive weeds and PM-10 dust issues, and could close public access routes that are critical for public land users who visit and recreate along Agua Caliente Road. The fact that the Gillespie SEZ lies in the Phoenix Active Management Area (AMA) will constrain the permitting process for groundwater use and would seem to argue that suitable locations for SEZs should exclude AMAs.

b. Another option is to delete the Gillespie SEZ from the Solar PEIS and defer further study to the Arizona RDEP process. Possibly, the RDEP process could find a more suitable location north of the Agua Caliente Road using a combination of BLM and State Trust Lands.

c. If the ultimate decision is made to retain the Gillespie SEZ in the Solar PEIS, then please consider adjusting the boundaries of the Gillespie SEZ so that its footprint excludes Agua Caliente Road and inventoried routes that go south from it. It should be noted that moving the Gillespie SEZ further north of Agua Caliente Road would reduce the distance needed to connect the SEZ to its transmission line.

Thank you for the opportunity to submit these comments. Please keep my name on your mailing list for future updates and notices of public comment periods.

Sincerely,

//signed//

Steve Saway

Thank you for your comment, Ann McPherson.

The comment tracking number that has been assigned to your comment is SEDDsupp20144.

Comment Date: January 27, 2012 17:26:16PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20144

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Comment Submitted:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

JAN 27 2012

Department of the Interior
Bureau of Land Management
Attn: Ms. Linda Resseguie
BLM Solar PEIS Project Manager
1849 C Street, N.W., Room 2134LM
Washington DC, 20240

Subject: Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States [CEQ# 20110361]

Dear Ms. Resseguie:

The U.S. Environmental Protection Agency (EPA) has reviewed the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States, including Arizona, California, Colorado, Nevada, New Mexico, and Utah. Our review was conducted pursuant to Section 309 of the Clean Air Act, the National Environmental Policy Act, and the Council on Environmental Quality NEPA implementing regulations (40 CFR Parts 1500-1508).

EPA recognizes the challenges associated with the development of the new Solar Energy Program and we strongly support the Bureau of Land Management (BLM) and Department of Energy (DOE) in this endeavor. In light of this undertaking and the large number of solar and other renewable energy projects that have been proposed in the Pacific Southwest, we were very pleased to enter into a Memorandum of Understanding with BLM last month to coordinate and cooperate on the NEPA process for renewable energy projects on federal lands administered by BLM in California, Arizona, and Nevada. Accelerating the pace of solar energy development on public lands in America will help meet the nation's energy demand, while reducing the amount of greenhouse gas emissions necessary to do so. To minimize adverse consequences and streamline project deployment, such projects should be directed away from areas of high conflict and sensitive resources, and towards areas of low conflict, including previously disturbed, degraded, or contaminated lands, sites adjacent to such lands, and locations that minimize the need for construction of new roads and transmission lines. This is consistent with the goals of recent Presidential directives designed to expedite the processing of renewable energy and infrastructure development projects through more efficient and effective permitting and environmental reviews. BLM's programmatic approach provides an excellent venue for thoughtful planning to avoid and minimize unnecessary environmental trade-offs at the project level.

We are pleased to see that the Supplement addresses several of the issues raised in our previous comments. Most importantly, BLM has made substantial progress in characterizing critical components of the new Solar Energy Program and in better identifying those areas within the Solar Energy Zones (SEZs) that are best suited for utility-scale solar energy development. Of significance, BLM has modified its preferred alternative to ensure that SEZs are not located in high conflict areas, reducing the number of zones from 24 to 17 and the corresponding acreage from 677,384 to 285,417 acres. The Supplement also establishes a protocol for identifying new SEZs in the future and discusses incentives designed to make development inside SEZs more attractive to industry.

However, we do have some concerns, and look forward to working with you on these issues. These concerns are addressed further in the enclosed detailed comments. For example, EPA recommends that BLM focus on identifying and incorporating disturbed, degraded or contaminated lands into the new Solar Energy Program. According to the Supplement, the identification of disturbed or previously disturbed sites is listed as a factor that will be considered in both the proposed identification protocol for new SEZs, as well as the proposed variance application process (pg. 2-29; 2-35). We recommend that more emphasis be placed on identifying and on siting future projects on disturbed, degraded, and contaminated lands, and that BLM and DOE offer additional incentives for development on such sites. We also recommend that BLM and DOE work with the Bureau of Indian Affairs to engage tribal governments to determine if there is interest in developing future SEZs on tribal land in light of recent proposed regulations for surface leases of trust land for energy and other uses.

Based on our review, we have rated the document as *Environmental Concerns - Insufficient Information* (EC-2). We appreciate the opportunity to provide comments on the Supplement to the Draft PEIS, and look forward to working closely with BLM and DOE to address the issues that we have identified. If you have any questions, please contact me at 415-972-3843, or contact Ann McPherson, the lead reviewer for this project. Ann can be reached at 415-972-3545 or mcpherson.ann@epa.gov.

Sincerely,

Enrique Manzanilla, Director
Communities and Ecosystem Division

Enclosures: Summary of EPA Rating Definitions
Detailed Comments

Cc: Jim Kenna, State Director, Bureau of Land Management, California State Office
Amy Lueders, State Director, Bureau of Land Management, Nevada State Office
Ray Suazo, State Director, Bureau of Land Management, Arizona State Office
Jesse Juen, State Director, Bureau of Land Management, New Mexico State Office
Juan Palma, State Director, Bureau of Land Management, Utah State Office
Helen Hankins, State Director, Bureau of Land Management, Colorado State Office
Tracey A. LeBeau, Director, U.S. Department of Energy, Office of Indian Energy Policy and Programs
Steve Black, Counselor to Secretary of the Interior, U.S. Department of the Interior
Janea Scott, Special Assistant to the Counselor, U.S. Department of the Interior
Michael Picker, Senior Advisor on Renewable Energy Facilities, State of California Governor's Office
Karen J. Atkinson, Director, Indian Affairs, U.S. Department of the Interior

SUMMARY OF EPA RATING DEFINITIONS*

This rating system was developed as a means to summarize the U.S. Environmental Protection Agency's (EPA) level of concern with a proposed action. The ratings are a combination of alphabetical categories for evaluation of the environmental impacts of the proposal and numerical categories for evaluation of the adequacy of the Environmental Impact Statement (EIS).

ENVIRONMENTAL IMPACT OF THE ACTION

"LO" (Lack of Objections)

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

"EC" (Environmental Concerns)

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

"EO" (Environmental Objections)

The EPA review has identified significant environmental impacts that should be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

"EU" (Environmentally Unsatisfactory)

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of public health or welfare or environmental quality. EPA intends to work with the lead agency to reduce these impacts. If the potentially unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

ADEQUACY OF THE IMPACT STATEMENT

"Category 1" (Adequate)

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

"Category 2" (Insufficient Information)

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analysed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

"Category 3" (Inadequate)

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analysed in the draft EIS, which should be analysed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From EPA Manual 1640, Policy and Procedures for the Review of Federal Actions Impacting the Environment

U.S. EPA DETAILED COMMENTS ON THE SUPPLEMENT TO THE DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR SOLAR ENERGY DEVELOPMENT IN SIX SOUTHWESTERN STATES, JANUARY 27, 2012

Variance Process

EPA supports BLM's proposal to reevaluate the need for additional SEZs in the variance areas at least every five years. Focusing solar development within SEZs offers many benefits, including reducing environmental impacts and streamlining the environmental review and permitting process. The establishment of new SEZs should better enable BLM's field offices to guide projects to more suitable locations. According to the Supplement, the variance process for projects proposed to be sited outside of SEZs includes two pre-application meetings, submission of a ROW application, submission of a Plan of Development, and various BLM coordination activities (pgs. 2-33 to 34). We are unclear, however, how the variance process specifically differs from BLM's current procedures for processing ROW applications.

Recommendations:
Clarify in the Final PEIS how the variance process will differ from the methods that BLM currently uses to process ROW applications. For example, the Final PEIS should describe whether future applications for projects located in SEZs would receive priority attention over applications in variance lands. If a proposed project does not utilize disturbed, degraded or contaminated variance land, BLM should consider requiring the developer to evaluate project alternatives within an SEZ in the applicant's Plan of Development and, if appropriate, in the project level NEPA analysis.

Greater Focus on Disturbed, Degraded, and Contaminated Lands

In our previous comments on the Draft PEIS, EPA committed to provide a list of contaminated sites tracked in our databases that are located in or near BLM-administered lands considered in the Solar PEIS. We have identified 25 sites, including two sites within the boundaries of the Solar Energy Development Alternative, using the boundaries presented in the Draft PEIS. Ten of the 25 sites are located within two miles of the Solar Energy Development Alternative area and one site is located within one mile of the Dry Lake SEZ. These sites are included in a table at the end of these Detailed Comments. Other federal, state, tribal, and local agencies, as well as the public, may be able to identify additional sites that should be considered for solar development.

Recommendations:
Expand the search for disturbed, degraded, and contaminated lands to include public, private, and tribal lands.

Work with the Nevada Department of Environmental Protection and other state agencies to examine recently active, but currently closed, mine sites on BLM land suitable for solar energy development and publish these sites in the Final PEIS.

Consider creating an Internet-based portal to allow for continuous input from other federal, state, tribal, and local agencies and the public, aimed at identifying lands that are disturbed, degraded or contaminated. Use this portal to begin to create a comprehensive inventory of such sites so that developers can be directed to these sites in the future.

Extend the same incentives designed to steer development to SEZs to disturbed, degraded or contaminated sites.

Include the list of contaminated sites identified by EPA in the Final PEIS, along with additional information about the sites and a preliminary determination as to their suitability for solar development.

Consider whether the boundaries of the Dry Lake SEZ should be adjusted to incorporate the site on EPA's list of contaminated sites that is located 0.65 miles from that SEZ.

Add the following sentence as a footnote to the RE-Powering America's Land Initiative on page 2-35: "EPA and other parties have or will continue to characterize and cleanup these sites to ensure they are protective for people."

Processing of Existing Solar ROW Applications

As of August 15, 2011, there were 79 pending solar applications. According to the Supplement, BLM intends to continue to process all pending applications that meet due diligence and siting requirements under BLM's current policies, and that pending applications on lands proposed as exclusion areas are likely candidates for denial.

We believe that future efforts should be focused on the designation of new SEZs and the identification of disturbed, degraded, and contaminated lands. Not allowing projects in exclusion areas will allow state and federal agencies to be more selective about lands to be utilized for development and should provide BLM with a better opportunity to evaluate the effectiveness of the Solar Energy Program.

Recommendations:
Disclose in the Final PEIS the numbers of pending applications that are located within the SEZs, variance lands, and exclusion areas, and include maps to illustrate the locations of the active ROW applications.

Provide clear and strong preference to project applications in SEZs with few resource constraints and on disturbed, degraded, and contaminated lands.

Competitive Bidding

The Supplement states that BLM may, through rulemaking, establish a competitive process that results in the immediate issuance of a ROW lease authorization to the successful bidder (pg. 2-23).

Recommendation:
Describe the competitive process in the Final PEIS more fully and clarify when the appropriate environmental analysis would be completed.

SEZ-Specific Action Plans – Appendices C.1 to C.6

EPA appreciates the inclusion of action plans for each of the SEZs, describing the changes that have been made to the SEZs, as well as outlining the additional information that will be collected (Appendix C.1 to C.6). According to the Supplement, some of the items identified in the action plans will be completed by BLM and presented in the Final PEIS. Data collection efforts not completed by BLM, however, would likely be required of developers as part of site-specific tiered analysis for future projects.

Recommendation:
Clarify in the Final PEIS when data will be collected in conjunction with the SEZ-specific action plans and how that data will be integrated into the decision-making process and/or presented if it is collected subsequent to the publication of the Final PEIS. For example, explain how stakeholders will be informed of newly designated 'non-development' areas in the SEZs.

The first section of each SEZ-specific action plan includes a summary of potential impacts identified in the Draft PEIS, followed by recommendations for additional data collection. Some recommendations on additional data collection are applicable to most, if not all, of the SEZs. EPA recommends one addition to the Water Resources section of each SEZ-specific action plan, as noted below.

Recommendation:
Include a functional assessment of waters of the U.S. to evaluate and disclose the existing condition of such waters and any potential adverse effects from solar development.

We are pleased to see that 'non-development' areas have been specified in many SEZs to avoid surface water features. Due to the scale of the maps, however, it is difficult to tell the size of these areas relative to the water resources they are protecting, or whether a buffer has been included in the area specified as 'non-development.'

Recommendations:
Provide more detailed information in the Final PEIS on the avoidance of surface water features, particularly as it relates to 'non-development' areas within SEZs, including whether or not a buffer has been included in such areas.

Establish 100-foot buffer zones[1] to avoid adverse impacts to water quality or hydrology of streams, wetlands and riparian areas. Larger buffers may be necessary depending on resources, landscape position, and surrounding land use.

[1] A 100-foot buffer for waters was proposed in the West Chocolate Mountains Renewable Energy Evaluation Area DEIS (June 2011).

Revised Transmission Analysis – Appendix C.7.1

We are pleased to see that BLM proposes to complete additional analyses of transmission needs for the SEZs being carried forward in the Final PEIS. According to the Supplement, this analysis will address transmission access issues associated with the SEZs and the extent of new transmission development that might be needed to support solar energy generation within the SEZs (pg. C-321). While the Supplement contains a commitment that the Final PEIS will include a more detailed evaluation of the transmission needs and impacts for anticipated solar development within the SEZs (pg. 2-25), it does not commit to addressing impacts associated with anticipated transmission line development (Section C.7.1).

Recommendation:
Include in the Final PEIS a general description of the types of impacts associated with upgrading transmission infrastructure or building new lines, along with a commitment that future project-specific NEPA analyses will address such impacts during the review of the proposed solar energy facilities.

Water Resources Action Plan – Appendix C.7.2

We appreciate the inclusion of the Water Resources Action Plan (Appendix C.7.2), which outlines seven main action plan items relating to water resources that apply to all SEZs going forward. We are pleased to see that the WRAP states that a planning-level inventory of water resources will be presented in the Final PEIS, as we recommended previously. The WRAP lists products that will be developed and sources of information that will be utilized for this inventory, such as Google Earth links to specific datasets.

Recommendations:
EPA recommends that BLM also utilize Google Earth to assist in mapping waters by including aerial photo interpretation at an appropriate scale.

Specify in the Final PEIS when the Floodplain Determinations, Jurisdictional Waters Determinations, and Significant Ephemeral Waters Determinations will be completed and how this information will be integrated into the decision-making process for the SEZs, particularly if these items are completed after the publication of the Final PEIS.

The WRAP states that the following seven SEZs will benefit from a more quantitative analysis of groundwater impacts including: Afton, Amargosa Valley, Brenda, Dry Lake, Dry Lake Valley North, Imperial East, and Riverside East. We support BLM's commitment to perform quantitative analyses of the potential drawdown impacts in certain SEZs; however, it is not clear how the seven SEZs listed in Section C.7.2 were selected for analysis. Our Draft PEIS comments expressed concern regarding groundwater impacts in the Escalante Valley and Milford Flats South SEZs, where subsidence has already been observed in association with excessive groundwater withdrawal. Development of a numerical groundwater model is listed in the SEZ-specific WRAP for Escalante Valley and Milford

Flats South, and we suggest clarification as to whether this is a different level of modeling than that described in Section C.7.2, or whether the two SEZs were inadvertently left off the list.

Recommendations:
Clarify in the Final PEIS whether additional groundwater modeling will be conducted in the Escalante Valley and Milford Flats South SEZs and if this is part of the general WRAP, or SEZ-specific action plans.

Perform additional quantitative analyses for the Escalante Valley and Milford Flats South SEZs.

Identify in the Final PEIS the criteria used to determine when a quantitative analysis is appropriate for an SEZ, and consider including situations where water availability is already limited to the point that wet-cooling options would not be feasible as one criterion.

Groundwater Impacts

EPA believes that there is the potential for adverse impacts to the long-term availability of groundwater in many SEZs, considering the quantities needed for maximum build-out and the potential impacts associated with pumping groundwater in these basins.

Recommendations:
Clearly identify in the Final PEIS the quantity of groundwater withdrawal allowable in each SEZ, and describe impacts associated with lowering of the water table.

Consider further restrictions on solar technology within SEZs in exceptionally arid regions, such as Afton, by limiting development to low water-use technologies such as photovoltaic systems.

EPA is particularly interested in the groundwater withdrawal in the Amargosa Valley SEZ. Groundwater withdrawals for construction and operation at full build-out capacity far exceed the available groundwater supply in this SEZ. Moreover, the basin is currently over-allocated and groundwater withdrawals have been curtailed due to restrictions protecting water rights at Devils Hole. In addition, it is currently not possible to model the extent that continued groundwater pumping will impact water levels at Devils Hole and Ash Meadows National Wildlife Refuge.[2] Regional groundwater models indicate that groundwater levels at Devils Hole are steadily declining and may reach critical levels in the near future. Small declines in spring discharge or changes in water temperature or water chemistry resulting from groundwater withdrawals in the basin may affect threatened and endangered species at Ash Meadows NWR. Consequently, it is likely that full build-out would have significant impacts to groundwater resources and groundwater-dependent species.

[2] Draft Environmental Impact Statement for the Amargosa Farm Road Solar Energy Project. See internet address: http://www.blm.gov/pgdata/etc/medialib/blm/nv/field_offices/las_vegas_field_office/energy/amargosa_farm_road3.Par.28872.File.dat/Chapter%204%20-%20Environmental%20Effects.pdf

Recommendation:
Given the over-appropriation of groundwater resources and the presence of special-status species, particularly in Ash Meadows NWR, EPA recommends that BLM eliminate the Amaragosa Valley SEZ and exclude this land from further development.

Air Quality

Our comments on the Draft PEIS recommended that additional information on Dust Abatement Plans and soil stabilization techniques be included in the Final PEIS to address potential adverse air quality impacts predicted by air quality modeling. The action plans presented in Appendix C, however, do not address the data gaps that we have referenced. In fact, the Supplement states that no additional air quality information is needed for any of the SEZs. EPA is concerned about cumulative impacts of fugitive dust, and we reiterate our recommendation to document the potential for cumulative air quality impacts of solar energy development, particularly on Class I areas. Fugitive dust mitigation techniques may fall within the scope of the design features, which will be updated in the Final PEIS. If this is the case, we look forward to seeing this additional information at that time.

Recommendations:
Present further information in the Final PEIS on Dust Abatement plans and soil stabilization techniques.

Document in the Final PEIS the potential for cumulative air quality impacts related to solar energy development, particularly on Class I areas.

Wind erosion is a major issue in the planning area. Construction of large solar energy projects could result in an increase in wind-borne particulate matter, which can lead to dust storms. Dust particles in the air can lead to a number of respiratory problems, asthma especially. Children, in particular, have greater sensitivities to various environmental contaminants, including air pollutants. Construction emissions could exacerbate existing conditions, such as asthma, for children, the elderly, and those with existing respiratory or cardiac disease. EPA suggests that BLM consult with the U.S. Department of Agriculture to identify soils that may be vulnerable to wind erosion. Any areas or regions that are determined to be particularly susceptible to wind erosion should be excluded from development, and this exclusion criterion should be added to Table 2.2-1. We suggest utilizing the New Mexico Wind Erosion Prediction Guide[3] to gain an understanding of the wind erosion process and how to identify areas that are susceptible to wind erosion.

Recommendations:
Consult with the USDA to identify soils that may be vulnerable to wind erosion and exclude from development areas that are determined to be particularly susceptible from development.

Consider including 'lands with vulnerability to wind erosion' as an exclusion criterion in Table 2.2-1.

[3] See Internet address: http://www.nm.nrcs.usda.gov/technical/fotg/section-1/references/weq-prediction-guide.html

Environmental Justice

In our comments on the Draft PEIS, EPA raised concerns over the methodology used to identify potential low-income and minority communities located near proposed SEZs, and we made several recommendations to improve the analysis. We recommended that BLM remove the state-wide analysis and utilize a lower threshold for the SEZ-specific analysis to define low-income and minority populations that are meaningfully greater than the state average. The SEZ-specific action plans, however, state that no additional information is needed regarding environmental justice issues.

Recommendations:
Revise and update the EJ analysis to provide more accurate analysis of impacted areas and comparisons with state demographics, both for minority percentages and low-income rates.

Include additional design features that address EJ concerns in the Final PEIS.

Cumulative Impacts

The Supplement discusses cumulative impacts briefly in Section 2.3.5, incorporating by reference the cumulative impact analysis presented in the Draft PEIS. The Supplement states that the cumulative impacts analyses for individual SEZs will be updated in the Final PEIS. Overall, BLM expects direct and indirect impacts, and therefore cumulative impacts, to be of lesser magnitude than was contemplated in the Draft PEIS. The Supplement also states that cumulative impacts may be more concentrated and/or severe within individual SEZs than was described in the Draft PEIS. In most cases, little or no information was presented in the Draft PEIS in support of these conclusions, nor were thresholds identified to determine significance.

Recommendations:
Address EPA's comments on the Draft PEIS concerning the cumulative impacts analysis, as presented in our comments on the Draft PEIS.

Describe the condition of the resource(s) and the time required for the resource(s) to recover from the impact of the proposed action, in conjunction with other past, present, and reasonably foreseeable future actions, in the Final PEIS.

Provide data to support the Supplement's assumption that direct, indirect, and cumulative impacts would be small to minor based on mitigation, as well as the Supplement's conclusion that cumulative impacts are likely to be of lesser magnitude than was contemplated in the Draft PEIS.

DOE's Proposed Programmatic Environmental Guidance

DOE's Proposed Programmatic Environmental Guidance is also presented in the Supplement. Using the guidance, DOE will select where to make technology and resource investments to minimize the environmental impacts of solar technologies. A second element of the guidance allows DOE to establish

environmental mitigation recommendations for project proponents who are seeking financial assistance from DOE. EPA is pleased to have the opportunity to review DOE's Proposed Programmatic Environmental Guidance and offers the following recommendations regarding Section 3.2.4, Water Resources and Erosion Control, as detailed below. We suggest replacing the word 'consider' and revising the language as follows:

- Bullet #1: **Give precedence to** technologies that minimize water use.
- Bullet #2: **Promote** sustainable use of water resources through appropriate technology selection **and implementation of** conservation practices that **protect and preserve the function, acreage, and quality** of the existing natural water bodies (including streams, wetlands, ephemeral washes, **microyphyll woodlands,** and floodplains, as well as groundwater aquifers).
- Bullet #4: Avoid locations that would involve impacts on surface water bodies, ephemeral washes, playas, **microphyll woodlands,** and natural drainage areas (including groundwater recharge areas).
- Bullet #11: **Contact the U.S. Army Corps of Engineers to discuss the reach and extent of waters of the U.S. on the proposed project site. Present a reasonable range of onsite and offsite alternatives and an analysis that evaluates alternatives to avoid impacts to waters in compliance with Section 404 of the Clean Water Act.**
- Bullet #12 (new): **Avoid impacts to waters of the U.S., including indirect impacts to waters of the U.S. located off the project site.**

EPA Tracked Sites located in the No-Action Alternative, as defined by the Draft PEIS.

Program	EPA_ID/ BF ACRES Property ID	Site ID/ BF Grant IDs	Site Name	Latitude	Longitude
Federal Superfund	NMD980750020	600911	LEE ACRES LANDFILL (USDOI)	36.711100	-108.092100
Abandoned Mine Land	NMD986684231	604718	STEPHENSON - BENNETT MINE	32.403000	-105.402000
Abandoned Mine Land	NM0001408608	605033	HORIZON POTASH MINE	32.425000	-103.760000
Abandoned Mine Land	UTN000802138	802138	OPERATION MINE SHAFT	37.772000	-113.171000
Abandoned Mine Land	CO0008969974	801727	CORKSCREW AND GRAY COPPER GULCHES	37.921000	-106.343000
Abandoned Mine Land	UTN010161078	801847	PIONEER 3-STAMP MILL	37.134000	-113.222000
Landfill	1554	0	Garfield County/John's Valley LF	37.821390	-112.383612
Abandoned Mine Land	UTD980667208	800679	MONTICELLO RADIOACTIVELY CONTAMINATED PROPERTIES	37.863880	-109.333610
Abandoned Mine Land	COD983801069	801336	GREAT WEST GOLD AND SILVER	38.382000	-107.043000
Abandoned Mine Land	UT0012605880	801913	BULLION CANYON MILLS	38.427000	-112.286000
Abandoned Mine Land	CO0000286203	801536	LONDON MINE	39.273000	-105.862000
Landfill	1534	0	Millard County LF	39.308334	-112.472779
Abandoned Mine Land	CO0001411347	801566	UPPER ANIMAS MINING DISTRICT	37.844000	-107.571000
Abandoned Mine Land	UT0001910793	801607	TINTIC STANDARD REDUCTION MILL	39.958000	-110.146000
Abandoned Mine Land	UT0010221516	801869	OPHIR MILLS AND SMELTER	40.221000	-112.153000
Landfill	930	0	Apex Regional LF	36.401670	-114.865180
Abandoned Mine Land	CA4141190567	903786	BLACKROCK MINE	37.362000	-117.605000
Landfill	192	0	Landers Disposal Site	34.240480	-116.381520
Abandoned Mine Land	AZ0000307959	905040	AMERICAN LEGION MINE	35.192000	-113.938000

Landfill	187	0	Kern Valley LF	35.750000	-118.433334
Abandoned Mine Land	NVD981989627	903042	UNITED MINING CORP.	39.313000	-118.353000
Landfill	1794	0	Sunrise Landfill	36.141201	-114.999080
Abandoned Mine Land	NVD000626531	903992	BARRICK GOLD STRIKE MINE - BLM	39.513000	-114.038000
Abandoned Mine Land	CAD980496863	901736	ATLAS ASBESTOS MINE	36.321660	-120.586700
Abandoned Mine Land	CA0000878058	905138	SISKON MINE	41.581000	-122.359000

EPA Tracked Sites located in the Solar Energy Development Program Alternative, as defined by the Draft PEIS.

Program	EPA_ID/ BF ACRES Property ID	Site ID/ BF Grant IDs	Site Name	Latitude	Longitude
Landfill	930	0	Apex Regional LF	36.401670	-114.865180
Landfill	192	0	Landers Disposal Site	34.240480	-116.381520

EPA Tracked Sites located near (2 miles or less) Solar Energy Zones, as defined by the Draft PEIS.

Program	EPA_ID/ BF ACRES Property ID	Site ID/ BF Grant IDs	Site Name	Latitude	Longitude
Landfill	930	0	Apex Regional LF	36.401670	-114.865180

EPA Tracked Sites located near (15 miles or less) the Solar Energy Development Program Alternative, as defined by the Draft PEIS

Program	EPA_ID/ BF ACRES Property ID	Site ID/ BF Grant IDs	Site Name	Latitude	Longitude
Federal Superfund	NMD980750020	600911	LEE ACRES LANDFILL (USDOI)	36.711100	-108.092100
Abandoned Mine Land	NMD986684231	604718	STEPHENSON - BENNETT MINE	32.403000	-105.402000
Abandoned Mine Land	NM0001408608	605033	HORIZON POTASH MINE	32.425000	-103.760000
Abandoned Mine Land	UTN000802138	802138	OPERATION MINE SHAFT	37.772000	-113.171000
Abandoned Mine Land	CO0008969974	801727	CORKSCREW AND GRAY COPPER GULCHES	37.921000	-106.343000
Abandoned Mine Land	UTN010161078	801847	PIONEER 3-STAMP MILL	37.134000	-113.222000
Landfill	1554	0	Garfield County/John's Valley LF	37.821390	-112.383612
Abandoned Mine Land	UTD980667208	800679	MONTICELLO RADIOACTIVELY CONTAMINATED PROPERTIES	37.863880	-109.333610
Abandoned Mine Land	COD983801069	801336	GREAT WEST GOLD AND SILVER	38.382000	-107.043000
Abandoned Mine Land	UT0012605880	801913	BULLION CANYON MILLS	38.427000	-112.286000
Abandoned Mine Land	CO0000286203	801536	LONDON MINE	39.273000	-105.862000
Abandoned Mine Land	CA4141190567	903786	BLACKROCK MINE	37.362000	-117.605000
Abandoned Mine Land	AZ0000307959	905040	AMERICAN LEGION MINE	35.192000	-113.938000
Landfill	187	0	Kern Valley LF	35.750000	-118.433334
Abandoned Mine Land	NVD981989627	903042	UNITED MINING CORP.	39.313000	-118.353000
Abandoned Mine Land	NVD000626531	903992	BARRICK GOLD STRIKE MINE - BLM	39.513	-114.038
Landfill	1794	0	Sunrise Landfill	36.141201	-114.999080

Thank you for your comment, Nick Hont.

The comment tracking number that has been assigned to your comment is SEDDsupp20145.

Comment Date: January 27, 2012 17:28:29PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20145

First Name: Nick
Middle Initial:
Last Name: Hont
Organization: Mohave County, Arizona
Address: P.O. Box 7000
Address 2:
Address 3:
City: Kingman
State: AZ
Zip: 86401
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Solar Energy Draft PEIS 1.27.12_1.pdf

Comment Submitted:

Please see attached.

MOHAVE COUNTY
DEVELOPMENT SERVICES

P. O. Box 7000 Kingman, Arizona 86402-7000 3250 E. Kino Ave, Kingman www.co.mohave.az.us Telephone (928) 757-0903 FAX (928) 757-3577

Nicholas S. Hont, P. E.
Department Director

Michael P. Hendrix, P. E.
Deputy County Manager

January 27, 2012

Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue – EVS/240
Argonne IL 60439

Dear Sir:

Mohave County appreciates the opportunity to comment on the Supplement to the Solar Programmatic Environmental Impact Statement. Our comments are below; please call me if you have any questions.

The Draft Solar PEIS as originally published proposed that 4,485,944 acres of BLM administered land would be available for application under the Solar Development Program. In the Supplement to the Draft Solar PEIS this number has been reduced to 3,397,007 acres, a reduction of 1,088,907 acres or approximately 24 percent. This is a significant reduction. Figure 2.3-1 demonstrates that a significant portion of the lands in the state of Arizona that are affected by the PEIS are located in Mohave County.

It appears that Mohave County may be affected by this reduction more significantly than any other county in the state. Private land in Mohave County accounts for only approximately 18 percent of its area, with BLM and Forest Service land accounting for approximately 61 per cent. This reduction in the lands that would be available for application may make it more difficult for Mohave County to attract renewable energy projects, and thereby conflict with the county's development plans and economic development policies.

Mohave County requests that the lands within its boundaries that were proposed in the original Draft Solar PEIS be retained and not reduced as proposed in the Supplement.

Thank you again for this opportunity

Sincerely,

Nicholas S. Hont

Nicholas S. Hont, P.E.
Director

bh

cc: Mike Hendrix, P.E., Deputy County Manager, Public Works & Development Services
Ron Walker, County Manager

Thank you for your comment, Donald Burnette.

The comment tracking number that has been assigned to your comment is SEDDsupp20146.

Comment Date: January 27, 2012 17:28:38PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20146

First Name: Donald
Middle Initial: G
Last Name: Burnette
Organization: Clark County
Address: Manager's Office
Address 2: 500 S. Grand Central Parkway, 6th floor
Address 3:
City: Las Vegas
State: NV
Zip: 89155
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: ClarkCounty-supplement to Draft Prog EIS-Solar Energy.pdf

Comment Submitted:

To whom it may concern:

Clark County would like to take this opportunity to provide comments on the Supplement to the Draft Programmatic Environmental Impact Statement (PEIS).

In April of 2011, Clark County commented on the initial draft of the PEIS. As was stated then, Clark County supports the goals of the PEIS to facilitate utility scale solar development on federal lands while minimizing environmental, social, and economic impacts. Being located in Southern Nevada, the County has one of the premier solar resources in the world, and solar development has the potential to provide clean renewable electricity to the region and much needed economic benefit to the County.

In reviewing the Supplement to the PEIS, Clark County would like to express appreciation for the efforts of the Bureau of Land Management and the Department of Energy in modifying this document to address Clark County's previous concerns. The County believes that the BLM Preferred Alternative (Modified Program Alternative) offers the most flexibility while still ensuring the protection of sensitive lands.

Consistent with the goals of the PEIS, the document should facilitate responsible development of solar energy. Clark County will continue to work with BLM to ensure that future solar development is not in conflict with the use of public lands for wildlife and resource protection, recreation, tourism, and community enjoyment as well as being consistent with the goals and principals of our land use plan.

Office of the County Manager

500 S Grand Central Pky 6th Fl • Box 551111 • Las Vegas NV 89155-1111
(702) 455-3530 • Fax (702) 455-3558

Donald G. Burnette, County Manager
Jeffrey M. Wells, Assistant County Manager • Randall J. Tarr, Assistant County Manager • Edward M. Finger, Assistant County Manager

January 27, 2012

Bureau of Land Management
Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue, EVS/240
Argonne, IL 60439

Re: Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

To Whom It May Concern:

Clark County would like to take this opportunity to provide comments on the Supplement to the Draft Programmatic Environmental Impact Statement (PEIS).

In April of 2011, Clark County commented on the initial draft of the PEIS. As was stated then, Clark County supports the goals of the PEIS to facilitate utility scale solar development on federal lands while minimizing environmental, social, and economic impacts. Being located in Southern Nevada, the County has one of the premier solar resources in the world, and solar development has the potential to provide clean renewable electricity to the region and much needed economic benefit to the County.

In reviewing the Supplement to the PEIS, Clark County would like to express appreciation for the efforts of the Bureau of Land Management and the Department of Energy in modifying this document to address Clark County's previous concerns. The County believes that the BLM Preferred Alternative (Modified Program Alternative) offers the most flexibility while still ensuring the protection of sensitive lands.

Consistent with the goals of the PEIS, the document should facilitate responsible development of solar energy. Clark County will continue to work with BLM to ensure that future solar development is not in conflict with the use of public lands for wildlife and resource protection, recreation, tourism, and community enjoyment as well as being consistent with the goals and principals of our land use plan.

Sincerely,

Donald G. Burnette
Clark County Manager

/NAL:rmt

Thank you for your comment, Robert Weisenmiller.

The comment tracking number that has been assigned to your comment is SEDDsupp20147.

Comment Date: January 27, 2012 17:40:04PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20147

First Name: Robert
Middle Initial: B
Last Name: Weisenmiller
Organization: California Energy Commission
Address: 1516 9th St., MS 31
Address 2:
Address 3:
City: Sacramento
State: CA
Zip: 95814
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: CEC DFG Solar PEIS COMMENTS 01-27-12.doc

Comment Submitted:

CALIFORNIA ENERGY COMMISSION
1516 Ninth Street Sacramento, California 95814
Main website: www.energy.ca.gov

DEPARTMENT OF FISH AND GAME
1416 Ninth Street Sacramento, California 95814
Main website: www.dfg.ca.gov

January 26, 2012

Shannon Stewart, Bureau of Land Management
Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue – EVS/240
Argonne, Illinois 60439

Dear Ms. Stewart:

The California Energy Commission (Energy Commission) and the California Department of Fish and Game (Fish and Game) (or collectively, "the Agencies") appreciate this opportunity to comment on the Supplement to the Draft DOE-BLM Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (Solar DPEIS or DPEIS) released in October 2011. The Energy Commission and Fish and Game are cooperating agencies in the development of the PEIS and have provided ongoing input, most recently as comments on the DPEIS on April 29, 2011. Our joint comments here are once again limited to the areas in California addressed by the Solar DPEIS.

The Renewable Energy Action Team (REAT) Agencies, which include the United States Fish and Wildlife Service, the United States Bureau of Land Management (BLM), the Energy Commission, and Fish and Game, initiated development of the Desert Renewable Energy Conservation Plan (DRECP or Plan) to accelerate the permitting and development of new renewable energy projects, while conserving natural communities, and associated species and their habitats. The synergies of this effort were most recently reinforced through the Memorandum of Understanding (MOU) Between the Department of the Interior and the State of California on Renewable Energy, signed by Department of Interior Secretary Salazar and Governor Brown on January 13, 2012. MOU Objectives 4 through 10 explicitly address the DPEIS and DRECP, by requiring the REAT agencies to integrate and coordinate the development of both processes.

We offer these general observations in response to the Supplement in order to continue our role in the promotion and enhancement of the state and federal efforts in the arena of environmentally sensitive development of renewable energy.

Recent Revisions to Proposed Solar Energy Zones and Potential SEZ Expansions

The adjustments of the DPEIS and the Solar Energy Zones (SEZs) that have been made in the Supplement largely comport with what is under consideration for the DRECP. The REAT will integrate the final boundaries of the Imperial East (unchanged in the Supplement) and newly delineated Riverside East SEZ as we adjust the Renewable Energy Study Areas (RESAs) of the DRECP, which were presented to stakeholders in October 2011. These RESAs are currently being further refined, after which portions of them will become Development Focus Areas (DFAs) to be presented in the Development Alternatives of the joint DEIS/EIR scheduled for public environmental review by the third quarter of 2012. The analysis and recommendations by BLM for further studies of resources on BLM lands, identified on the basis of response comments to the DPEIS and listed in Appendix C of the Supplement, will be incorporated in our reviews. We look forward to the continued use of emergent PEIS information to augment the DRECP process.

The DRECP Preliminary Conservation Strategy identified five RESAs. These RESAs include polygons nearly identical to the Imperial East and Riverside East SEZs, and also include a RESA near Owens Lake in Inyo County and two RESAs (West Mojave and Barstow) in the Western Mojave Desert. These latter RESAs have been delineated in concordance with both representatives of renewable energy industry and other stakeholders to focus development in suitable portions of the Western Mojave. In general terms, the identification of this level of acreage within DFAs (current RESAs exceed 3,500,000 acres) is expected to accommodate anticipated demand for some time. The REAT recognizes the need to build in mechanisms to allow further expansions if needed and likely will be addressing this during the further development of the DRECP. Consideration of additional SEZs beyond those in the Supplement should occur as part of the DRECP process. Consequently, the Agencies believe the Solar PEIS should not facilitate development outside of DRECP DFAs through any type of a variance process that has not been adopted by the DRECP.

Proposed PEIS Variance Process

The Supplement reduces the acreages available for development in the Modified Program Alternative in California from more than 1,700,000 acres to less than 1,400,000 acres, and provides an initial outline of a process through which

applicants may still apply for variances that would allow development in these areas that are outside of the two current SEZ boundaries.

The DRECP is an integrative process that places due consideration of the long-term conservation of species, their habitats and the natural communities of which they are part. The Plan will have a reserve design component within which areas most suited for mitigation and enhancement will be identified. In addition, the Plan will designate the DFAs as primarily responsive to energy development needs. This integrative design by necessity evaluates the relative ecological values of lands outside of DFAs that nevertheless may be eligible for energy development, and creates scaled mitigation "costs" to offset impacts to environmental resources. The success of ecologically sound conservation planning for the 22,587,000-acre Plan Area, which will include the entirety of the PEIS lands, other federal lands that are outside of BLM's jurisdiction, and non-federal lands, is dependent on a consistent method for evaluating and mitigating impacts on all Plan Area lands, including those outside of SEZs and DFAs. Consequently, integrated planning will best be served if the methods for siting outside of SEZs or DFAs in California continue to be developed through the DRECP. The concepts in the draft variance process proposed in Section 2.2.2.3 of the Supplement will be useful in the establishment of review protocols for these areas.

Integration of the Solar PEIS and the DRECP in California

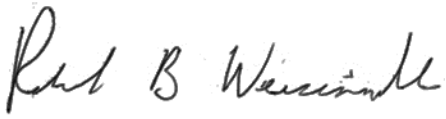
The DRECP Planning effort is scheduled to be complete in 2013 and continues to move forward with the hard work and collaboration among the State, BLM and USFWS.

The BLM California Office (BLM-CA) has committed to and has initiated scoping for a California Desert Conservation Area (CDCA) amendment that would allow BLM to consider plan amendments for recommending additional conservation and development that align with the DRECP and the DRECP Conservation Strategy. This plan amendment is being incorporated into the joint EIS/EIR process that will advance in the second quarter of this year.

The Supplement acknowledges the DRECP as the foundation for possible amendments to the CDCA Plan and three Resource Management Plans, and for identification of additional SEZs by BLM-CA. This formal acknowledgment of the DRECP's role in the implementation of the PEIS is important, but further formalization of this linkage in the form of a standardized protocol will be necessary in order to ensure that the PEIS and DRECP are truly integrated. For the proposed BLM variance process, the Supplement acknowledges the DRECP only in a context for general coordination, in a statement that "….[C]onsideration should be given to … coordination with California REAT agencies" (pg. 2-39). At a minimum, a more definitive protocol should be established that would prevent any possible disconnect between applicant initiation of any BLM PEIS variance

application and draft DRECP designations for conservation of specific areas. In any period of time between start of the Solar Energy Development in Six Southwestern States project and the DRECP, any significant siting actions or processes should be closely coordinated with the REAT. We also continue to recommend that when the final iteration of the PEIS is adopted, its implementation is closely coordinated with DRECP development and implementation, through the direct participation of the BLM California Office in the REAT.

In closing, the Agencies thank you for the opportunity to comment on the Supplement to the DPEIS. The State of California values the evolving partnership with the federal agencies and individuals who participate with the REAT, and with the Department of the Interior. The Agencies remain committed to work with BLM and the BLM California Office, to coordinate our joint planning processes and efforts to responsibly and efficiently site and permit renewable energy facilities in California.



ROBERT B. WEISENMILLER
Chair
California Energy Commission

KEVIN W. HUNTING
Chief Deputy Director
California Department of Fish and Game

Thank you for your comment, Sean Gallagher.

The comment tracking number that has been assigned to your comment is SEDDsupp20148.

Comment Date: January 27, 2012 17:41:00PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20148

First Name: Sean
Middle Initial:
Last Name: Gallagher
Organization: K Road Power
Address: 1 Embarcadero Center
Address 2: Suite 360
Address 3:
City: San Francisco
State: CA
Zip: 94111
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: K Road comments on Supp Draft SPEIS.doc.docx

Comment Submitted:

kRoad Calico

January 27, 2012 **VIA INTERNET**

Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue, EVS/900
Argonne, IL 60439

Re: Comments of K Road Power on the Supplemental Draft Solar PEIS

K Road Calico Solar (K Road) is pleased to submit these comments on the Supplemental Draft Solar PEIS.

K Road supports the comments filed jointly today by the Solar Energy Industries Association ("SEIA"), the Large-scale Solar Association ("LSA"), and the Center for Energy Efficiency and Renewable Technologies ("CEERT")(collectively, the "Solar Industry Comments").

K Road also supports the comments filed jointly today by a group of conservation, utility and solar developer stakeholders ("Joint Comments"). However, K Road provides additional comment, in the nature of clarification, on one point. To the extent that there is any ambiguity in the Joint Comments, K Road clarifies that the existing and any future amendments to the Calico Solar Project's approved Right of Way Grant should be treated in the same manner as pending applications, i.e. under existing processes, rather than subject to those applicable to "new" applications under the SPEIS. For instance, the proposed prohibition on "new" applications in the Pisgah area after the SPEIS Record of Decision is issued does not apply to existing or future amendments to Calico's previously approved Right of Way Grant. See fn. 6 in the Joint Comments and fn. 7 in the Solar Industry Comments. Nothing in the Joint Comments should be read to the contrary. This is certainly the way that BLM has treated amendments to previously approved Right of Way Grants to date,[1] and should continue to be the case for such amendments. BLM should provide clarity on this point in the Final SPEIS.

Best Regards,

Sean Gallagher
K Road Calico Solar

[1] BLM issued a Notice of Intent to Prepare a Supplemental Draft EIS for the Calico project in October 2011, and has placed the amendments to the Calico ROW Grant on its 2012 Renewable Energy Priority List, http://www.blm.gov/wo/st/en/prog/energy/renewable_energy/2012_priority_projects.html.

Thank you for your comment

The comment tracking number that has been assigned to your comment is SEDDsupp20149.

Comment Date: January 27, 2012 17:41:16PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20149

First Name: [Withheld by requestor]
Middle Initial:
Last Name: [Withheld by requestor]
Organization:
Address: [Withheld by requestor]
Address 2:
Address 3: [Withheld by requestor]
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold name and address from public record
Attachment:

Comment Submitted:

As a citizen, taxpayer and one very much involved in my state's (Maryland) and my country's public lands, I would like to comment on your agency's solar plan for the next 20 years.

Last year, I was aware that BLM drafted a Solar Energy Development Programmatic Environmental Impact Study. It is my understanding that your agency did make some important changes last fall (October). However, the areas identified were few.
My understanding was that projects located in solar energy zones will be prioritized for development.

Basically, your agency has left open the possibility that solar development might still occur on more than 20 million acres of BLM lands through the "variance process".
Variances should be the exception, not the rule, for future solar development. Development should not occur in an area unless conflicts with wildlife and other important natural resources can be avoided or offset by purchasing other conservation lands and restoring other important habitat.

Your website states one of its missions is to "protect the health, diversity, productivity of our public lands for future generations."
If we are going to allow solar and other new forms of green energy to be developed let us do it right.
We have so messed up with our fossil fuels and destroyed so much of our environment. Let's do this right……

Solar projects in appropriate zones will require less environmental analysis reduce the cost to developers for offsetting unavoidable impacts and will encourage development of transmission lines to get solar power to our businesses and homes. Basically, development in proper solar zones will be more efficient, less costly, provide more certainty for developers and conservationists, and the power produced will be wildlife friendly.

Why not make better use of this country's degraded lands such as brownfields and old mining sites. By recycling degraded areas rather than using more sensitive and ecologically rich can preserve important wildlife habitats and protect valuable natural resources.

So, We should minimize wildlife and other important natural resources. Limit variances for projects outside the zones (make them an exception; not norm.)
And, we should require developers to avoid, minimize and mitigate any unavoidable effects on wildlife by promoting wildlife friendly solar development.

Thanks you for reading my views and I would appreciate be apprised of future developments in this matter.

Sincerely,

Thank you for your comment

The comment tracking number that has been assigned to your comment is SEDDsupp20150.

Comment Date: January 27, 2012 17:41:40PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20150

First Name: [Withheld by requestor]
Middle Initial:
Last Name: [Withheld by requestor]
Organization:
Address: [Withheld by requestor]
Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold name and address from public record
Attachment:

Comment Submitted:

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We have so messed up with our fossil fuels and destroyed so much of our environment. Let's do this right……

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And, we should require developers to avoid, minimize and mitigate any unavoidable effects on wildlife by promoting wildlife friendly solar development.

Thanks you for reading my views and I would appreciate be apprised of future developments in this matter.

Sincerely,

Thank you for your comment, Michael Powelson.

The comment tracking number that has been assigned to your comment is SEDDsupp20151.

Comment Date: January 27, 2012 17:43:08PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20151

First Name: Michael
Middle Initial:
Last Name: Powelson
Organization: The Nature Conservancy
Address: 821se 14th Avenue
Address 2:
Address 3:
City: Portland
State: OR
Zip: 97214
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: SOLAR PEIS MITIGATION LETTER 120127.pdf

Comment Submitted:

See attachment

January 27, 2012

Mr. Bob Abbey
Director
Bureau of Land Management
Solar Energy PEIS
Argonne National Laboratory
9700 South Cass Avenue
Argonne, IL 60439

Dear Mr. Abbey:

Thank you for the opportunity to comment on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development (SDPEIS). Our organizations greatly appreciate the tremendous effort BLM has undertaken in the development of the draft PEIS and the subsequent Supplement, to create a solar development program. However, a critical aspect of a comprehensive solar development program is essentially absent, that of mitigation.

Mitigation, and specifically compensatory mitigation, provides an essential opportunity to protect the health of the nation's land, waters, and wildlife, while facilitating cost-effective, efficient and timely development of our nation's energy resources. To best meet the nation's conservation and energy development goals requires creating a mitigation program that is transparent, systematic, based on sound science, and addresses clear conservation priorities. Many (if not all) of the elements of a comprehensive mitigation program BLM is already using, developing or exist. The BLM/DOE Solar PEIS provides an opportunity to mesh these elements together under a consistent policy framework. The goal is clear policies establishing how compensatory mitigation is integrated into project NEPA documents and BLM decisions for all projects, leading to increased effectiveness and accountability of offsite mitigation while providing project developers, agency staff, and stakeholders with greater certainty regarding mitigation objectives and methods for implementing offsite mitigation. BLM appears to rely on the project proponent to design and develop mitigation proposals with little advance guidance, leading project developers to spend significant time and money developing a plan with very little idea of what will ultimately be required. And for a variety of reasons, project developers are not appropriate entities to design and implement compensatory mitigation.

The PEIS should define a mitigation *framework* that captures the mitigation hierarchy and drives siting and mitigation. The undersigned recommend that the mitigation hierarchy, i.e. avoid, minimize and offset, should be the guiding principle in establishing a mitigation framework and a subsequent compensatory mitigation program. These recommendations are principally focused on "offsets," i.e. compensatory offsite mitigation, however it is important that the entire mitigation hierarchy by addressed in the PEIS.

The primary and most important basis of a mitigation framework, and the basis for a compensatory mitigation program, is an understanding of the ecological attributes of the lands under consideration. We r**ecommend** the PEIS commit to using landscape-scale and finer scale ecological assessments that articulate the ecological health, status and/or condition of the species, habitats, migration corridors, and related values, e.g. recreation, across the landscape of potential development and any subsequent mitigation, i.e. the geographic scope of the PEIS. The PEIS should specifically commit, at a minimum, to incorporating and using existing and ongoing ecological analysis, especially those of its own creation and those of the affected States. Much of this information is currently available or under development by the BLM (and sister DOI agencies and contractors), States, and organizations like The Nature Conservancy and Natureserve. This includes BLM's Rapid Ecological Assessments (REAs), products created for the PEIS by Argonne and others, products produced by BLM's Assessment, Monitoring and Inventory (AIM) efforts, the California Desert Renewable Energy Conservation Plan (DRECP), BLM's Restoration Design Energy Project in Arizona, State Wildlife Plans, State Decision Support Systems (DSS), The Nature Conservancy's Mojave eco-regional assessment and West Mojave least conflict analysis.

A mitigation framework within the PEIS should seek to avoid ecological impacts to the greatest extent possible, especially to resources that cannot be mitigated or are declining – avoiding impacts by proper siting based on ecological analyses is the surest, easiest and best way to avoid subsequent mitigation demands. Significant impacts to habitat that supports special functions and values may simply not be replaceable through mitigation and therefore the best course may be to avoid those areas altogether. We recommend the PEIS identify specific lands where development should not occur. This list should be expanded to exclude development where there are ecological or other resources that are not mitigatable, declining, limited or rare, and should take into account the cumulative effects of development in determining these attributes.

After avoidance, a mitigation framework within the PEIS should seek to minimize ecological impacts through project design, and require Best Management Practices (BMPs) that specifically seek to minimize impacts during construction, operation, maintenance, and decommissioning, including implementing appropriate conservation measures related to timing and conduct of project activities. While the PEIS has extensive discussion of project siting, construction and operational BMPs, it provides little ecological and subsequent monitoring criteria to ensure that impacts are minimized to the greatest extent possible, especially to groundwater. The PEIS should establish clear ecological benchmarks that developers are to address in project development and operation.

The last facet of a mitigation framework is compensation for residual impacts (direct and indirect effects that are not avoided or minimized on-site) by providing replacement habitats, restoration of habitats, or other benefits, e.g. management actions that provide conservation benefits. The mitigation hierarchy recognizes that offsite mitigation is an inherently uncertain undertaking, which means that compensatory mitigation is sought only after efforts to avoid and minimize the impacts have been addressed. Inclusion of a compensatory mitigation program in the PEIS is the most efficient, cost-effective way to ensure the mitigation hierarchy is fully addressed within the mitigation framework.

A robust compensatory mitigation program consists of six elements:

1. An ecological baseline upon which unavoidable impacts are assessed.
2. A transparent mechanism or methodology to assess & quantify unavoidable impacts over the life of the impacts.
3. A consistent methodology to translate the impacts into dollars, i.e. mitigation investments.
4. A structure to hold, prioritize and apply mitigation investments. At a minimum the structure should include BLM, the USFWS, and State Fish and Game agencies – we recommend that key stakeholders be represented as well, including counties and conservation, sportsmen and recreation organizations.
5. A prioritization, e.g. conservation plan, as to where and how mitigation investments should be made to address impacts while seeking the highest return on investment.
6. Monitoring to ensure mitigation investments are adequate relative to impacts over the life of the impacts, with a feedback loop to ensure the mechanism to assess and quantify the impacts and the methodology to translate the impacts into mitigation investments adequately reflect sufficient mitigation.

We recommend the PEIS, at a minimum, include the establishment of a compensatory mitigation program that encompasses the six elements listed above, including at a minimum, attributes for each element that inform how they would be structured and implemented.

Thank you for your consideration of our comments. We look forward to working with BLM on creating a mitigation framework and specifically regional mitigation plans that ensure protection of our countries critical natural resources while allowing the robust development of solar energy.

Sincerely,

Robert Bendick
Director, U.S. Government Relations
The Nature Conservancy

Gary Taylor
Legislative Director
Association of Fish and Wildlife Agencies

Steve Williams
President
Wildlife Management Institute

Boone & Crockett Club

Miles Moretti
President/CEO
Mule Deer Foundation

Pamela Pride Eaton
Deputy Vice President for Public Lands
The Wilderness Society

Thank you for your comment, Virgil Moose.

The comment tracking number that has been assigned to your comment is SEDDsupp20152.

Comment Date: January 27, 2012 17:57:09PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20152

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Attachment: Big Pine Paiute Tribe comments on Supplement Solar PEIS----1-27-12.pdf

Comment Submitted:

BIG PINE PAIUTE TRIBE OF THE OWENS VALLEY
Big Pine Paiute Indian Reservation

January 27, 2012

Shannon Stewart
Bureau of Land Management
Washington Office
Washington, D.C.

RE: Comments on the *Supplement to the Draft Programmatic Environmental Impact Statement (EIS) for Solar Energy Development in Six Southwestern States (Supplement) (BLM/DES 11–49, DOE/EIS–0403D–S),* and related draft *Programmatic Agreement (PA)*

Dear Ms. Stewart:

Please accept the following comments from the Big Pine Paiute Tribe of the Owens Valley (Tribe). By letter dated June 9, 2011, the Tribe also submitted comments on the *Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States, December 2010 (PEIS)*, and related draft Programmatic Agreement (PA). The Tribe received a PA for this project in February 2011, but no subsequent versions of the PA for Tribal comment were ever received.

Unfortunately, the Supplement did not address most of the Tribe's comments. Most importantly, the Supplement did not add a "distributed generation" alternative to the PEIS, even though this was requested by the Tribe and many other commenters, including the EPA. Without this viable alternative for solar energy development, only a narrow field of false choices is presented by the BLM. The Supplement was an opportunity to address this major failing of the draft PEIS, but this NEPA document remains inadequate in its range of alternatives. The Tribe's draft PEIS comments on this issue (on page 2 of the Tribe's June 9, 2011 letter) still stand for the Supplement:

> "BLM's Solar Energy Development Program Alternative (the Preferred Alternative), Solar Energy Zone Program Alternative, and the No Action Alternative do not provide a true range of alternatives for solar energy development in the United States. The PEIS rejects distributed generation and widespread development of rooftop solar as an alternative even though this would be a true alternative to utility-scale solar development on BLM lands. The justification was the non-mandate from the Energy Policy Act of 2005 and DOI Secretarial Order 3285A1. However, the DOI Secretarial Order requires the study of the best locations of utility-scale renewable energy projects; it doesn't mandate that these projects must be built on BLM lands. Distributed generation and widespread rooftop solar development needs to be an alternative in this PEIS."

Big Pine Tribal Office
P.O. Box 700 • 825 South Main Street • Big Pine, CA 93513
Phone: 760-938-2003 • Fax: 760-938-2942

General Comments:
Large-scale solar projects should not be built on desert lands that are not disturbed, degraded, or contaminated, i.e., brownfields

The deserts of southwestern United States are places where life has successfully evolved despite harsh conditions and where Native Americans learned to adapt and live in harmony. For a variety of reasons, many people value these open and generally intact landscapes. There is much to be learned from these unique places, which could be forever destroyed by short-sighted human disruption.

California's minimally disturbed desert landscapes are inappropriate for solar development because, in part, of the biological resources they contain and the ease with which the resources may be destroyed. The scientific literature is replete with articles discussing the fragility of desert landscapes, including in California. Many habitats in California's deserts evolved slowly, responding to gradual climate changes occurring since the end of the last ice age. Ancient biological resources such as the desert tortoise, pupfishes, creosote bush clones, and relatively undisturbed cryptogamic surfaces persist in places. It is well documented in the scientific literature that recovery from disturbances is slow (see for examples: Webb, R. H. and H. G. Wilshire (eds.) 1983. Environmental effects of off-road vehicles: Impacts and management in arid regions. Springer-Verlag. New York., and Belnap, J., S. L. Phillips, J. E. Herrick, and J. R. Johansen. 2007. Wind erodibility of soils at Fort Irwin, California (Mojave Desert), USA, before and after trampling disturbance: Implications for land management. Earth Surface Processes and Landforms 32(1):75-84). Furthermore, following major disturbances, full recovery to prior conditions is unlikely: what's lost is lost forever, at least from the human timeframe.

There is still a lot to learn about life and ecosystems on earth, and California deserts harbor organisms and undergo processes as yet unknown to science. A principal tenet of conservation biology is keeping all the parts. For example, botanists who study California's desert flora acknowledge "that the Mojave Desert remains a floristic frontier and that we still have an incomplete understanding of its flora in general" (Elvin, M., A. Sanders, and J. Andre. 2012. *Monardella* in the Mojave – A status update on our knowledge of the genus. Abstract, California Native Plant Society Conservation conference, January 2012, http://www.cnps.org/cnps/conservation/conference/2012/pdf/cnps2012-presentation_abstracts.pdf). In addition to botanical resources, the desert contains animals, including arthropods (a group likely to have innumerable taxa as yet undescribed) and cryptogams, which are known to be vitally important to ecosystem health, water dynamics, and nutrient cycling.

Modified Solar Energy Development Program Alternative (BLM Preferred Alternative)

This alternative is inadequate because it leaves over 20 million acres of non-disturbed, non-brownfield desert lands open to industrial-scale solar development. The **Revised Areas for Exclusion** under this Alternative should also include all areas which *are not* brownfields. However, this is was not included in the Areas for Exclusion, thus threatening millions of acres of land better preserved for its cultural and environmental resources.

As the Tribe stated in its June 9, 2011 letter for the draft PEIS:

> "Recommendations of Independent Science Advisors for The California Desert Renewable Energy Conservation Plan (DRECP):
>
> **Principles for Siting and Designing Renewable Energy Developments**
>
> **Maximize Use of Already Disturbed Lands**—To the greatest degree possible, site all renewable energy developments on previously disturbed land (areas where grading, grubbing, agriculture, or other actions have substantially altered vegetation or broken the soil surface), and site all linear facilities within or alongside existing linear rights-of-way, paved roads, canals, or other existing linear disturbances, so long as this does not create complete barriers to wildlife movements or ecological flows. Habitat fragmentation and impediments to wildlife movements are among the greatest threats to desert communities and species, and maximizing habitat connectivity is essential to climate change adaptation. The combined effects of both new and existing linear features on wildlife movement should be mitigated with appropriate crossing structures or corridors to facilitate wildlife movement (p.vi)."

The variance areas near the Big Pine Indian Reservation, located east of the Reservation, near the base of the Inyo Mountains, and in the lava flow blackrock country south of the Reservation, are exactly the same as the designations for solar development presented in the draft PEIS (see Attachment 1). These lands are regarded as traditional Tribal territory. The Owens Valley Paiute cultural landscape would be permanently harmed if large-scale solar development were to occur in the designated variance areas. The Modified Solar Energy Development Program Alternative (BLM Preferred Alternative) should be rejected, and the Tribe is opposed to all variance areas in all six southwestern states of the project.

Modified SEZ Program Alternative

The Tribe also does not recommend the Modified SEZ Program Alternative because these areas are not brownfields and will severely impact environmental and cultural resources. In California, the Pisgah and Iron Mountain SEZs were removed from consideration, but the Imperial East and Riverside SEZs were retained with slight modifications. The modifications did not negate the Tribe's opposition to these two SEZs for environmental and cultural reasons as stated in the Tribe's letter of June 9, 2011, on the draft PEIS.

The Amargosa Valley, Dalmar, Dry Lake, East Mormon Mountain, Escalante Valley, Gold Point, Milford Flats, Millers, and Wah Wah Valley SEZs should also be eliminated because of Native American concerns as expressed in the ethnographic analyses posted on the Solar Energy Development PEIS webpage: http://solareis.anl.gov/documents/ethnographic/index.cfm .

In order to comply with NEPA regulations (40 CFR 1502.14: (a) "Rigorously explore and objectively evaluate all reasonable alternatives)," the BLM needs to include a Distributed Generation Alternative, which would be a reasonable and least environmentally destructive alternative.

Conclusion

The Supplement did not correct the problems of the draft PEIS, and did not address the Tribe's comments on including the reasonable alternative of Distributed Generation in its analysis. The Supplement also did not exclude all areas which are not brownfields according to the Environmental Protection Agency's *RE-Powering America's Land: Siting Renewable Energy on Potentially Contaminated Land and Mine Sites*.

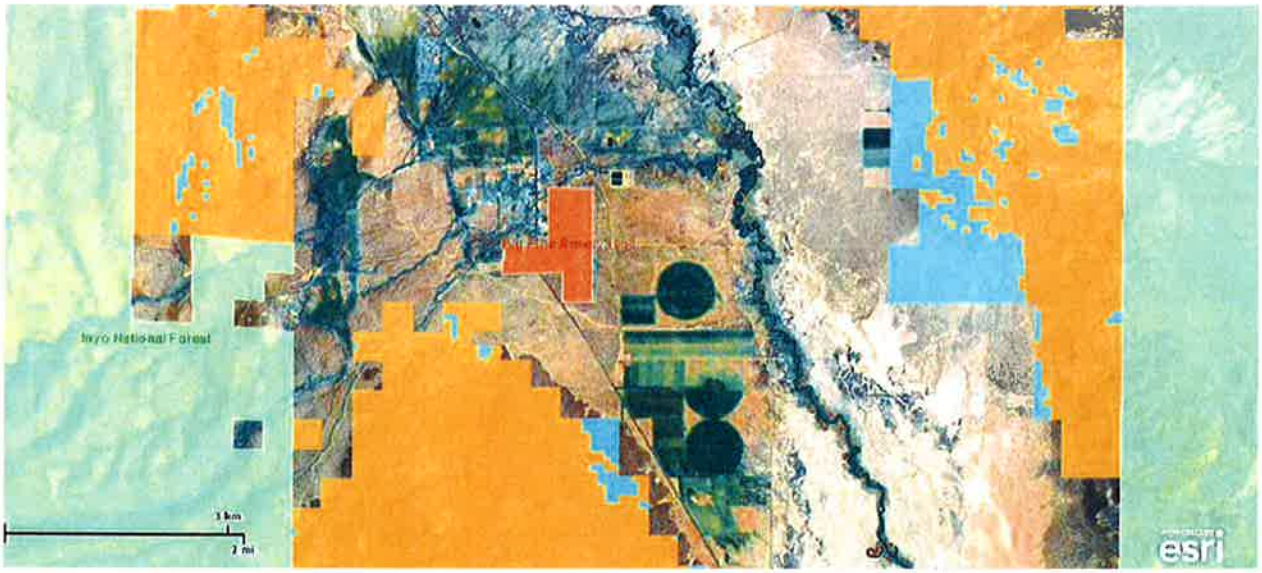
As stated in the Tribe's June 9, 2011, letter on the draft PEIS:

> "The Big Pine Paiute Tribe strongly favors well-planned solar energy development over the continued reliance on fossil fuels and nuclear power. The Tribe believes distributed generation and a massive effort to build and subsidize rooftop solar installations should be at the forefront of United States energy policy in cooperation with tribes."

Sincerely,

Virgil Moose
Tribal Chairperson

ATTACHMENT 1



Variance Areas (in blue) near the Big Pine Paiute Reservation proposed for large scale solar development under the *Modified Solar Energy Development Program Alternative (BLM Preferred Alternative)*.

Thank you for your comment, Harvey Sherback.

The comment tracking number that has been assigned to your comment is SEDDsupp20153.

Comment Date: January 27, 2012 18:03:23PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20153

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Attachment:

Comment Submitted:

January 27, 2012

California's Solar Powered Aqueduct System Featuring The Central Valley's Delta-Mendota Canal

America's coal fired, oil fired, natural gas and nuclear power plants use more than 185 billion gallons of fresh water daily in the generation of greenhouse gas producing electricity. Only agriculture uses more water.

As you know, photovoltaics consumes no water and produces no greenhouse gasses over their 20-t0-40 year life-cycle. This is very important as we reluctantly face the unsettling prospect of worldwide climate destabilization.

In 2010 the Department of Water Resources partnered with the University of California to explore the feasibility of putting solar panels "along or over" California's Aqueduct System.

Solar panels can cover, run alongside or be floated along the canals on flat pontunes. Why ruin pristine desert lands, especially in the Mojave Desert, when there are hundreds of miles of these canals are already in place.

For example, there is California's Delta-Mendota Canal. Its purpose is to replenish the San Joaquin River with Delta water.

Construction period: 1946-1951
Length: 117 miles

Typical section:
Bottom width: 100 feet
Side slope: 3:01
Water depth: 14.3 feet

The Delta-Mendota Canal is mostly concrete-lined and is operated by the United States Bureau of Reclamation and the Delta-Mendota Water Authority.

Aerial Photo: Delta-Mendota Canal

http://www.flickr.com/photos/amenfoto/3285100067/

Aerial Photo: Delta Mendota Canal with windmills in the Diablo Foothills.

http://www.flickr.com/photos/amenfoto/3285469699/

The 117 mile Delta-Mendota Canal is ideally situated in a sunny desert-like environment.

Because of its proximity to the existing power grid, little or no new land would be required to connect the Canal's photovoltaic canopy to the Path 15 transmission line corridor. Close proximity to the grid means that less electricity is lost during transmission.

Water is life!

The Delta-Mendota photovoltaic canopy project can be seen as a pilot concept for other out of state applications. It would also act as a "stimulus" to California's scientific and engineering community, providing an opportunity to develop new, cost-effective green technologies.

This project is unique among alternative energy projects because it is designed to protect California's water resources, while delivering clean, renewable electricity.

Harvey Sherback
Berkeley, California

Thank you for your comment, Joni Bosh.

The comment tracking number that has been assigned to your comment is SEDDsupp20154.

Comment Date: January 27, 2012 18:09:23PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20154

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Comment Submitted:

The revised PEIS is an improvement over the original. Removing some lands from approved zones, such as the Pisgah in California and Bullard Wash in Arizona, makes great sense. I would have removed even more areas. So, too, does establishing a clear process for identifying lands outside of the zones

However, degraded lands such as mining sites, brownfield sites and abandoned/exhausted farming lands should be available for development BEFORE pristine wildlands.ANY solar development, inside or outside of a zone, must be consistent with BLM wildlife policy with tough and protective mitigation measures that get enforced.

There is more than enough land included in the current list of zones to satisfy years of solar energy development. There is really no reason to look at other lands, less suitable, through a variance process.

The agency should focus on those sites with the best chance of widespread support, develope a clear plan for mitigation and have no or little impact on our nation's waters, wildlife and unique scenic treasures.

Thank you for your comment, Laurie Hietter.

The comment tracking number that has been assigned to your comment is SEDDsupp20155.

Comment Date: January 27, 2012 18:12:46PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20155

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Attachment: Soda Mountain PEIS Comment Letter 27January 2012.pdf

Comment Submitted:

Please see attached comment letter. The letter will also be sent by certified mail.
Laurie Hietter

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27 January 2012

U.S. MAIL & INTERNET FORM
Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue, EVS/240
Argonne, IL 60439

Re: Comments on the Supplement to the Solar Energy Development Draft Programmatic Environmental Impact Statement

To whom it may concern:

Thank you for the opportunity to comment on the Supplement (SDPEIS) to the Solar Energy Development Draft Programmatic Environmental Impact Statement (PEIS) prepared by the U.S. Department of Energy, Energy Efficiency and Renewable Energy Program (DOE) and the U.S. Department of the Interior, Bureau of Land Management (BLM) pursuant to the National Environmental Policy Act (NEPA).

Panorama Environmental, Inc. submits this comment letter on behalf of the applicant for the proposed 350 MW Soda Mountain Solar Project located approximately 5 miles southwest of Baker, California on both sides of Interstate Highway 15 (I-15) in San Bernardino County, California (CACA-049584).

While the programmatic comments of the solar trade organizations will address most concerns regarding the PEIS as it relates to the Soda Mountain Solar Project, there are two matters of particular importance to the project that we would like to address in detail, namely, the pending projects exemption and the desert tortoise connectivity areas map.

Pending Applications

The SDPEIS states that pending applications filed prior to 30 June 2009 will be subject to "continued processing under existing policies," including the February 2011 Instruction Memoranda (Nos. 2011-059 to 2011-061) (SDPEIS Table 1.7-1, page 1-9). We support the exclusion of pending applications from the terms of the PEIS and its Record of Decision (ROD). However, the SDPEIS does not clearly state the pending projects exemption, and some provisions actually contradict it. We therefore respectfully request the following clarifications.

Clarify Ambiguous Language

The SDPEIS states that pending projects will continue to be processed under "existing regulations and policies". However, the PEIS will itself become "existing policy" upon issuance of its ROD. We therefore recommend:

- clearly defining "existing regulations and policy" to mean regulations and policies in effect prior to adoption of the PEIS ROD; and

- adding language to the PEIS and its ROD expressly stating that pending projects are not subject to the PEIS before or after issuance of its ROD, and will instead be processed as though the "no action" alternative had been adopted.

Delete Express Contradictions and Modify Implicit Contradictions

Some language in the SDPEIS contradicts the pending projects exemption and should be deleted. For example, the following provision assumes the PEIS ROD would apply to pending projects:

> Pending applications on lands proposed as exclusion areas for utility-scale solar energy development in the Final Solar PEIS are likely candidates for denial. Upon issuance of the Solar PEIS ROD, the BLM may deny pending applications to the extent such applications overlap with exclusion areas identified in the ROD for the protection of ecological, cultural, visual, or other specified resource values (SDPEIS Page 1-11, lines 14-18).

We recommend deletion of this language because it undermines the pending projects exemption. The Federal Land Policy and Management Act of 1976, the 43 C.F.R. Part 2800 regulations, and BLM's February 2011 Instruction Memoranda already provide BLM with the tools it needs to reject pending applications.

Other provisions of the SDPEIS contradict the pending projects exemption by implication. For example, by stating that the BLM may deny pending applications before adoption of the PEIS, the following statement creates a presumption that the PEIS will apply to pending projects after its adoption: "The BLM may decide to deny pending solar applications before completion of the Solar PEIS ROD if the BLM has a supportable, rational basis" (SDPEIS Page 1-10, lines 24-25). We therefore request replacing this sentence with the following: "Although BLM will not apply the Solar PEIS to pending solar applications, the BLM still may decide to deny pending solar applications if the BLM has a supportable, rational basis on other grounds."

To avoid similar confusion, we also recommend qualifying the following provision, "The ROD for the Solar PEIS will recognize all previously approved solar projects" by adding the following clause: "and will expressly exclude pending projects from its terms." (SDPEIS Page 1-12, line 18).

Specify How to Implement the Pending Projects Exemption

Although the pending projects exemption is a clear concept, its application is less clear, particularly with regard to substantive resource issues. Because the PEIS is a prospective document intended to regulate and facilitate solar development applications submitted after 30 June 2009, we recommend the following additions to the SDPEIS to ensure proper implementation:

- an express statement that PEIS maps do not apply to approved or pending project sites unless the approved project is cancelled or the pending project application is withdrawn or rejected. We recommend overlaying approved and pending project boundaries on each of the PEIS maps with a legend item summarizing this concept.

- an express statement that neither the maps nor the resource determinations of the PEIS are to inform pending project NEPA analyses, which shall instead independently assess project-specific resource issues on a case-by-case basis.

Desert Tortoise Conservation Areas and Proposed Connectivity Areas

The SDPEIS includes a map depicting "Desert Tortoise Conservation Areas and Proposed Connectivity Areas." (SDPEIS Figure 2.3-1, page 2-44). We request that the proposed connectivity area overlaying the Soda Mountain Solar Project in the valley between the Soda Mountains south of Baker, west of the Mojave National Preserve (MNP), be removed for the following reasons:

1. No tortoise were found in the proposed connectivity area after recent protocol surveys;
2. The proposed connectivity area is surrounded by regional barriers to tortoise movement;
3. There is little, if any, opportunity for migration through the proposed connectivity area; and
4. The Soda Mountain Solar Project would not preclude migration through the valley.

No Tortoises

No tortoises were found on the site after conducting protocol-level surveys (RMT and URS 2010) (see discussion of field surveys below). Separate from the surveys, the closest historical tortoise

observations documented in database queries, input from local resource specialists (including BLM biologists), are approximately 16 miles to the north, 14 miles to the east, and 28 miles to the southwest of the study area (RMT and URS 2010). The results of the surveys and database queries are on file with the California Desert District Office under CACA-049584.

Recent Field Surveys

The lands in and around the proposed connectivity area west of the Mojave National Preserve (MNP) were extensively inventoried for the presence of sensitive vegetation and wildlife species for the Soda Mountain Solar Project. A protocol-level desert tortoise field survey consisted of 100% coverage belt transects spaced at 33 ft within a 6,770-acre study area. In addition to 100% coverage of the study area, Zones of Influence (ZOI) transects were also performed, which are defined as the areas where tortoise on adjacent lands may be indirectly affected by the Project. ZOI transect locations were developed and approved in consultation with biologists from the Barstow BLM Field Office and were in areas containing suitable tortoise habitat based on Geographic Information System (GIS) aerial mapping, Digital Elevation Model (DEM) mapping, and field observations of suitable habitat within the study area. The ZOI were surveyed with transects spaced at 100 ft, 300 ft, 600 ft, 1,200 ft, and 2,400 ft intervals, where applicable.

To validate the accuracy of the protocol surveys, biologists conducted an additional intensive Quality Assurance/Quality Control (QA/QC) survey on 5% of the study area. This intensive survey effort was composed of 100% coverage using belt transects with spacing reduced to 10 ft width and was conducted in randomly-chosen, representative habitats within the study area. QA/QC transects were conducted perpendicular to the initial transect survey direction in order to maximize tortoise detection. A comparison was then made between data recorded from transects during the 100% survey effort (33 ft belt transects) with data obtained during the intensive QA/QC survey effort (10 ft belt transects)(RMT and URS 2010).

Regional Barriers to Tortoise Movement

The proposed connectivity area in the Soda Mountains area is surrounded by barriers to tortoise movement. Figure 1 shows the topography of and around the proposed connectivity area. The south and east portion of the connectivity area is bounded by I-15, which serves as an effective barrier to tortoise movement to the south and east, as does the Rasor Road Off Highway Vehicle Area (Figure 2). The Soda Mountains surround the proposed connectivity area and serve as a barrier to tortoise movement from the connectivity area to the north, east and west. Moreover, Baker Sink, part of a north-south low topography feature and desert wash complex located to the east of the connectivity area, and Soda Lake, the dry playa Baker Sink drains into, have also been identified as areas of low potential for tortoise occurrence (Hagerty et al. 2010). In

combination, I-15, the Soda Mountains, Baker Sink and Soda Lake all serve as formidable barriers to tortoises migrating into or out of the MNP, with the perimeter of the proposed connectivity area surrounded by one or another barrier to migration.

A recent National Park Service article (Hagerty and Tracy 2011) corroborates this conclusion with a genetic study determining that the Soda Mountains and Baker Sink serve as effective barriers to desert tortoise migration and indicating that the area around the Soda Mountain Solar Project site has a low probability of tortoise occurrence, with likely connectivity pathways located well north, east, south and west of the Soda Mountain Solar Project site (Figure 3).

No Connection

But for the barriers mentioned above, the proposed connectivity area might seem to be a logical corridor to the MNP because of its proximity, and it is on this basis that the proposed connectivity area appears to be drawn: to provide connectivity northwards from the Cronese Basin Area of Critical Environmental Concern, through the portion of the Soda Mountain Solar Project site lying to the northwest of I-15, and then eastwards under I-15 and into the MNP (Figure 2).

Given the barriers mentioned above, however, it is highly unlikely that desert tortoises would traverse the narrow bottlenecks at the southern and northern extremes of the proposed connectivity area to make use of it as a migration corridor. The southern extreme is approximately 200 feet wide at its narrowest point, bounded by the I-15 to the southeast and mountainous terrain to the northwest. The northern extreme is even more limited, apparently relying on a 100-foot wide culvert under I-15 to allow movement eastwards into the MNP, as stated above. And even if such narrow entrance/exits to the proposed connectivity area were feasible migration routes, they lead directly into the Baker Sink and its substantial desert wash complex, which act as a barrier to migration (Hagerty et al. 2010; Hagerty and Tracy 2011).

Project Not a Barrier to Migration

Finally, even if the proposed connectivity area were viable, the proposed Soda Mountain Project would only occupy a small portion, leaving substantial habitat for migration, if it occurs.

Conclusion

We sincerely appreciate the efforts of BLM and DOE to promote environmentally responsible solar energy development of BLM-administered lands through the PEIS process. Our comments above seek to further those efforts by clarifying the pending projects exemption and requesting

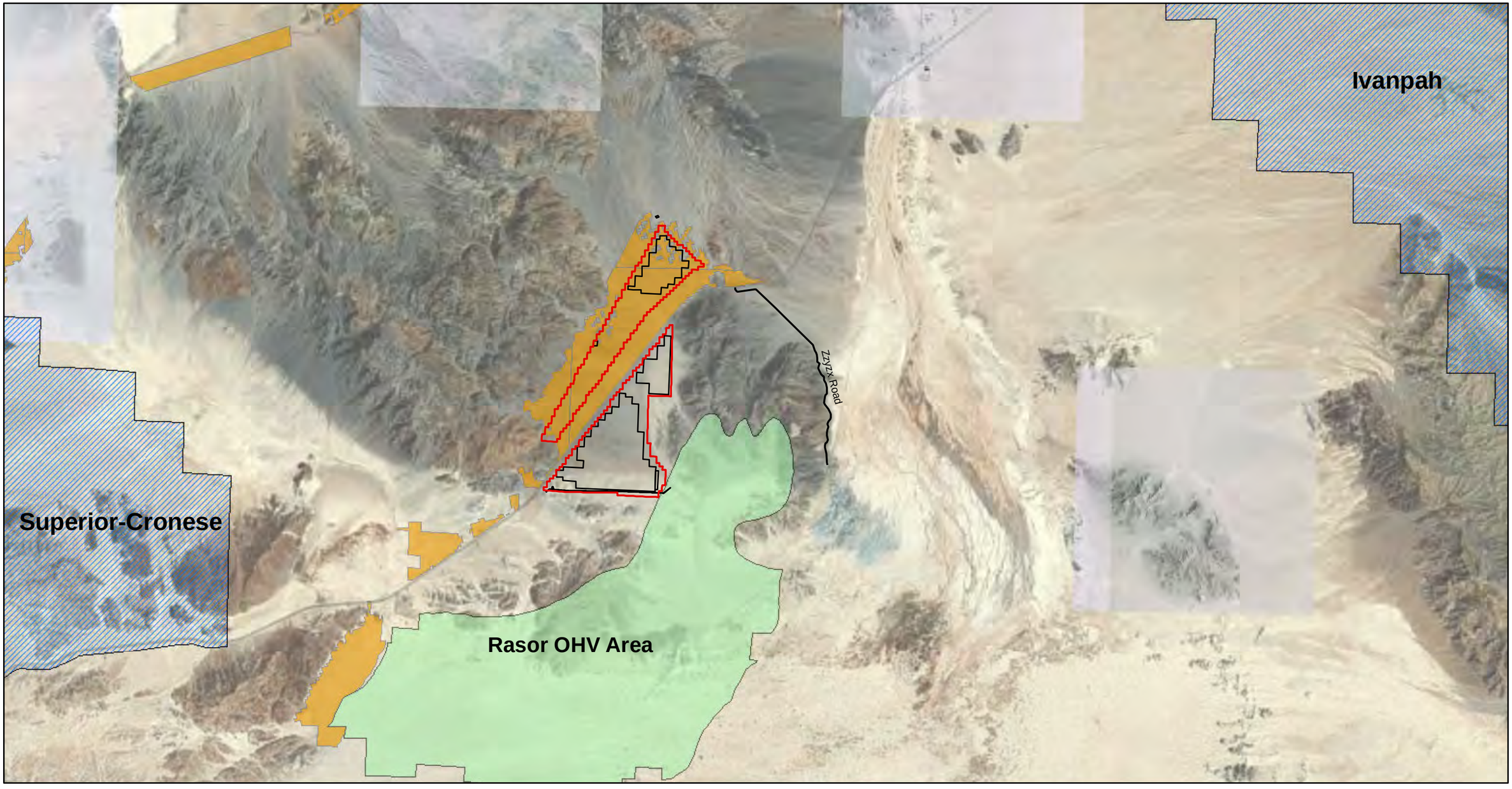
removal of a desert tortoise connectivity designation that lacks factual support. Thank you for your time and consideration.

Sincerely,

Laurie Hietter
Principal
Panorama Environmental, Inc.

Enclosures

Figure 1: Relief Map
Figure 2: Desert Tortoise Connectivity and Land Use
Figure 3: Desert Tortoise Occurrence
Exhibit A: References



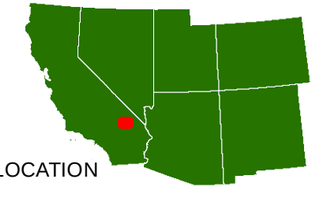
LEGEND

- PROPOSED PROJECT AREA BOUNDARY
- PROJECT FACILITY FOOTPRINTS
- DESERT TORTOISE CONNECTIVITY AREA
- DESERT TORTOISE CRITICAL HABITAT
- RASOR OHV AREA

0 0.5 1 2 3 4 Miles

N

SHEET LOCATION



PROJECT: SODA MOUNTAIN SOLAR PROJECT

SHEET TITLE: DESERT TORTOISE CONNECTIVITY AND LAND USE

DRAWN BY: fongc

DATE PRINTED: 1/27/2012

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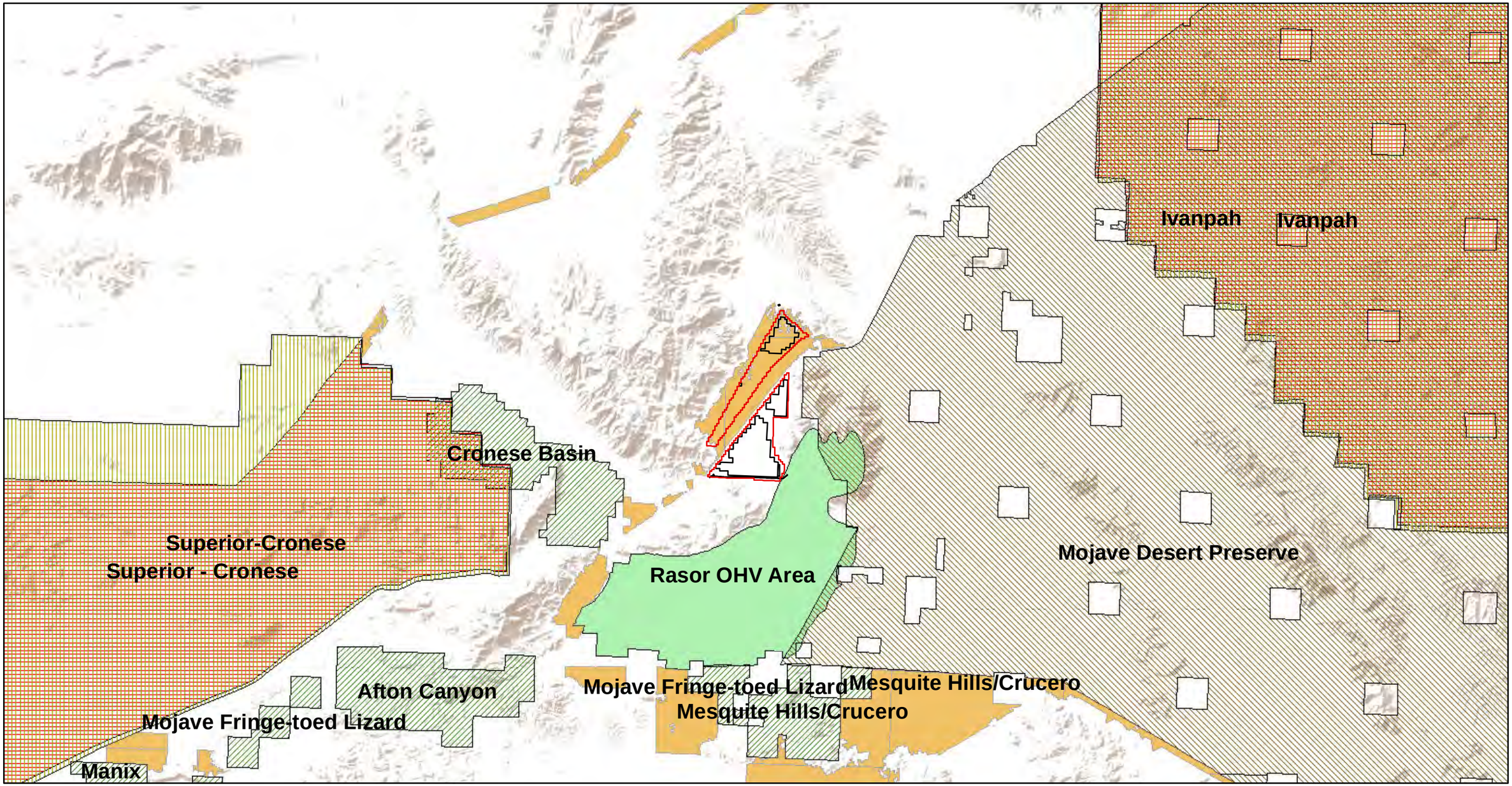
Figure 2: Land Use



LEGEND

- PROPOSED PROJECT AREA BOUNDARY
- PROJECT FACILITY FOOTPRINTS
- DESERT TORTOISE CONNECTIVITY AREA
- ACEC
- CHU
- DWMA
- National Park
- RASOR OHV AREA

0 1.25 2.5 5 7.5 10 Miles

N

SHEET LOCATION

PROJECT:	SODA MOUNTAIN SOLAR
SHEET TITLE:	DESERT TORTOISE CONNECTIVITY AND LAND USE
DRAWN BY: fongc	DATE PRINTED: 1/20/2012

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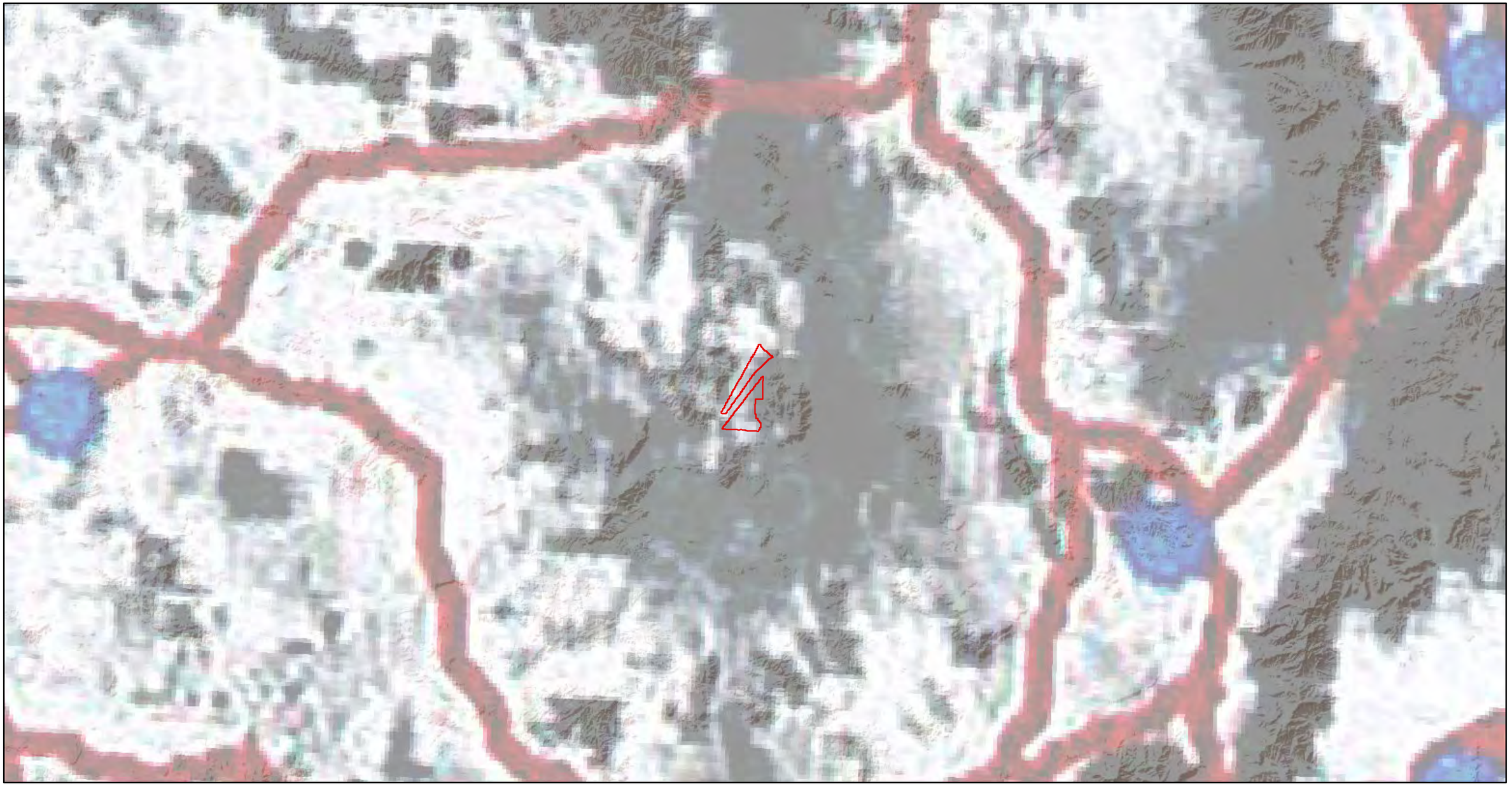
Figure 3: Probability of Tortoise Occurrence near Soda Mountain Solar Project Area



LEGEND

Source: Hagerty et al. 2010

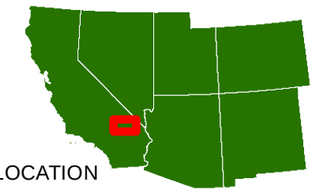
Project_Area5

Gradient of grey (floating values) indicate probability of desert tortoise occurrence. Black indicates lowest probability (0) while white indicates highest probability (1). Red lines indicate least cost paths between pairs of sampling locations. Blue dots represent the 25 population centroids

0 2 4 8 12 16 Miles

N

SHEET LOCATION



PROJECT:	SODA MOUNTAIN SOLAR
SHEET TITLE:	DESERT TORTOISE CORRIDORS
DRAWN BY: fongc	DATE PRINTED: 1/20/2012

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Exhibit A

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Thank you for your comment, Bryan Faehner.

The comment tracking number that has been assigned to your comment is SEDDsupp20156.

Comment Date: January 27, 2012 18:35:44PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20156

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Privacy Preference: Don't withhold name or address from public record
Attachment: Final NPCA et al. Supplemental Draft Solar PEIS Comments 1.27.12.pdf

Comment Submitted:

National Parks Conservation Association • Mojave Desert Land Trust • Morongo Basin Conservation Association

January 27, 2012

Secretary Ken Salazar
Department of the Interior
1849 C Street, NW
Washington DC 20240

Secretary Stephen Chu
U.S. Department of Energy
1000 Independence Ave., SW
Washington, DC 20585

Re: Supplement to the Solar Energy Development Draft Programmatic Environmental Impact Statement

Dear Secretaries Salazar and Chu:

The National Parks Conservation Association (NPCA), Mojave Desert Land Trust (MDLT) and Morongo Basin Conservation Association (MBCA) appreciate the opportunity to submit comments on the Supplement to the Solar Energy Development Draft Programmatic Environmental Impact Statement (PEIS).

NPCA, the leading private voice for the parks, is a national non-profit well-represented in the Southwest with offices in Arizona, Colorado, California, Nevada and Utah. We represent 600,000 supporters who care deeply about America's shared natural and cultural heritage preserved by the National Park System. Tens of thousands of our supporters have already contacted you requesting that agencies be "smart from the start" by working to ensure that new solar energy infrastructure is appropriately located away from National Park Service (NPS) units and critical conservation lands.

The Mojave Desert Land Trust conserves land with important biological, cultural and scenic values. MDLT's work helps to secure the biodiversity, beauty and integrity of healthy desert ecosystems for future generations to enjoy. MDLT has over 1300 members and has protected over 32,000 acres of desert land through acquisition, land stewardship and strategic partnerships.

The Morongo Basin Conservation Association is a 501(c) 4, community-based, California Nonprofit Corporation, incorporated in 1969 and dedicated to preserving the economic and environmental welfare of the Morongo Basin. MBCA has a vision that many residents of California's Morongo Basin share: healthy environment, rural character, prosperous communities and cultural wealth. MBCA has over 1000 members throughout California's High Desert Region.

Our three organizations continue to support the Modified Solar Energy Zone (SEZ) Alternative that would focus development within discrete low-conflict lands. We believe that it best balances the need to make lands available for new solar energy infrastructure, while ensuring that national park units, other protected lands and sensitive desert landscapes are conserved. If the agencies select the Modified Preferred Alternative, which would allow for new development on approximately 20 million acres of Bureau of Land Management (BLM) lands outside SEZs and around parklands, then strong protective measures must be put in place.

Accordingly, we believe the "precautionary principle" should be applied to help ensure that park resources and lands surrounding landscapes that may impact them are conserved. NPCA believes that this do no harm until you know more approach, which is reflected in the Administration's goal of being "smart from the start" should mean that inherently high-conflict public lands within 15-miles of units of the National Park System should be excluded from consideration unless the NPS determines they are in fact appropriate for consideration under the proposed "variance" process.

This policy would help deter controversial projects in the future, so that mistakes made in the past relating to the permitting of poorly sited solar facilities near parks, do not occur again. We strongly believe that this is an entirely reasonable and sensible precaution to help ensure that America's national parks and their sensitive resources are preserved unimpaired for future generations to enjoy.

To be clear, our groups strongly applaud the Department of Interior (DOI) and Department of Energy (DOE) for their efforts to bolster solar energy generation in the United States and improve planning and evaluation of utility-scale solar energy development facilities on BLM lands. Solar energy is one of our countries most promising renewable energy sources in transitioning away from America's current reliance on coal-fired power plants that contribute to unhealthy air quality in many of our nation's national parks. Establishing smart environmental policies and mitigation strategies for solar energy projects will contribute to bringing clean, renewable solar energy to market more quickly.

We believe that bringing more solar energy on-line and protecting park resources and critical desert landscapes is not mutually exclusive. However, it's critical that close coordination between the NPS, stakeholders and local gateway communities, takes place. Our groups have worked with community leaders, local elected officials and stakeholders to educate and inform affected parties about this process and implications, and we have encouraged their participation. Still, some residents and stakeholders, especially from the California Desert, may not have the financial means to participate in this important national level discussion, have felt disassociated from this process and are concerned about impacts to national park units and resources their communities depend on. We thank DOI and DOE for their recent effort to better engage and listen to the concerns of local stakeholders who live in park gateway communities, so that conflict is reduced and concerns are addressed.

We appreciate the hard work the departments and agencies have put into preparing the Solar Energy PEIS and hope that our concerns and suggestions, which are more broadly presented below, are carefully considered.

I. Improvements Have Been Made to Proposed SEZs, But More SEZs Are Needed

The Modified Solar Energy Zone (SEZ) Alternative poses the least potential harm to parks because it would focus solar development within identified SEZs (or "zones") that would help avoid needless conflicts with the 37 park units located in proximity to BLM lands identified in the PEIS. It would also bring solar energy facilities on-line faster, while better preserving broader ecological landscapes anchored by our national parks. Furthermore, it would also allow for the creation of new SEZs as necessary after an additional environmental review and public comment.

We thank DOI and DOE for removing and reconfiguring earlier proposed SEZ's away from national park units, wildlife corridors and pristine desert lands. The removal and/or reconfiguration of the Iron Mountain SEZ, the Pisgah SEZ, the Riverside East SEZ, the Amargosa Valley SEZ and the Red Sands SEZ are major improvements that we greatly appreciate.

Our groups recognize that the 285,000 acres identified within the currently proposed zones may not be sufficient and that the creation of new zones in well-studied, appropriate locations is needed. At this time, we recommend that the BLM prioritize work to identify appropriate lands within known locations such as the Chocolate Mountains, West Mojave and the Daggett Triangle in California. Additionally, we believe that California's Desert Renewable Energy Conservation Plan (DRECP) process should be used to identify future California SEZs and modify current SEZs because this process has had extensive stakeholder input, is habitat focused and has a great deal of information about rare and sensitive species.

We also recommend that DOI and DOE partner with the Department of Defense (DOD) to identify military lands that may be suitable for solar development and for becoming new SEZs. The DOD recently announced that it had examined lands in southern California and found that approximately 50,000 acres are suitable for solar development, but other military lands in southwestern states should also be considered. We believe that the creation of DOD/DOI zones and the addition of other appropriate zones should help reduce the need for public lands outside of zones by providing known, incentivized lands with high insolation and minimum conflict. DOI and DOE should work in partnership with other federal departments and agencies to inventory lands in order to identify disturbed properties that may be more appropriate for new zones. Finally, consideration should be given for consolidating state lands and exchanging them for disturbed lands closer to load centers.

II. The Preferred Alternative and Variance Process Need Major Improvement to Ensure the Preservation of Units of the National Park System

Our three organizations oppose the Modified Solar Energy Development Program Alternative, which is the preferred alternative, because it would allow for 20 million acres of BLM lands

outside of SEZs to be made available (via the "variance" process) for applicants to pursue construction of solar energy facilities. We continue to believe that making lands available outside of the SEZs is unnecessary and, more importantly, contrary to the Administration's underlying goal of instituting a proactive planning framework to expedite solar energy development. Moreover, due to the increased potential for resource conflicts, there would likely be additional (and avoidable) administrative costs for DOI, as well as extra costs, time, and uncertainty for companies attempting to acquire permits. In sum, we believe allowing for solar development within the 20 million acres of BLM lands identified for variance is quite simply a distraction and would shift focus and resources away from instituting an effective and common-sense process laid out under the Modified Solar Energy Zone (SEZ) Alternative that holds so much potential.

If the preferred alternative were to be selected in the final Record of Decision (ROD), we insist that a number safeguards are put in place to help ensure that park resources, including park scenery, wildlife and wildlife corridors, night skies and water, are protected for future park visitors to enjoy. Because the development of solar infrastructure near national park units is inherently high-conflict, we believe that public lands within 15-miles of units of the National Park System should be excluded from consideration unless the NPS determines they are appropriate for consideration under the proposed "variance" process. Our groups recognize that the proposed variance process was developed to allow for greater flexibility to identify and develop low-conflict locations for solar development, but lands near NPS units will likely rarely meet these criteria.

As currently proposed, hundreds of thousands of acres of variance lands lay directly adjacent or near national park units, and could be available for application. The development of these variance lands could present multiple negative impacts including, but not limited to, disrupting wildlife corridors, negatively impacting tourism, degrading the visitor experience, harming ecologically core lands, impacting park water sources, impairing scenic vistas, and inducing inappropriate development on private in-holdings within park boundaries.

In its current form, variance would allow project applications adjacent to National Parks, on pristine desert habitat, and would re-introduce many of the conflicts associated with the no action alternative. Those include a scattered approach to developing renewable energy which could fragment landscapes, encourage de-facto zones along right-of-way corridors, and negatively impact communities and wildlife. We believe that developing a robust system of incentivized zones represents the best alternative to reduce conflict by providing consensus-based locations to direct industry towards.

Importantly, we think that DOI and DOE insufficiently stress that variance is a lesser priority for siting new solar development and that applicants should be directed towards utilizing low-conflict, consensus-based SEZs. Variance should be the rare exception to SEZs and strong incentives and disincentives should be in place to focus utilities away from the proposed 20 million acres of variance lands.

We also believe that variance should be strengthened to include all stakeholders, including the public at large, at pre-application meetings to assess proposals. If an applicant seeks to build a

solar project, it makes sense to introduce the proposal to neighboring communities whose livelihoods could be impacted, before the BLM accepts a full application.

III. Proposed Variance Lands Put Numerous NPS Units at Risk

Our three organizations have identified locations currently proposed for variance that present high resource conflict to National Parks, park gateway communities, and/or natural or cultural resources and should be made exclusion areas and off-limits to new solar development. This list indicates foreseeable conflicts that would likely occur within proposed variance lands if solar projects were proposed. Threatened parks include:

Mojave National Preserve in CA

- Variance lands proposed in Ivanpah Valley on both sides of the California/Nevada state line provide significant conflict due to the potential taking of desert tortoise for Ivanpah Solar and the multiple development projects proposed including solar projects, an international airport, a gas pipeline, an agricultural inspection station, and a recently approved high speed rail. The cumulative impacts of these foreseeable projects, the dense population of tortoises, and the significant take of desert tortoises associated with Ivanpah Solar should preclude this area from variance applications.
- Lands north, east, and west of Clark Mountain should be excluded. This exclave of Mojave National Preserve protects Joshua Tree woodland, Pinyon-Juniper woodland, and diverse barrel cactus-Yucca transition zone. The lands directly north of this unit are proposed for variance and for a designated energy corridor connected to the Ivanpah Valley to the east. The Joshua tree, yucca covered lands proposed for variance are surrounded on three sides by wilderness, and adjoin the boundary of Mojave National Preserve. These lands provide habitat for desert tortoise and may be a significant refuge for the California population of the Gila monster. We oppose variance lands in this area and the proposed energy corridor directly adjacent to the Preserve's boundary. We recommend energy transmission lines be routed along the nearby energy corridor to the south along the Interstate 15 right-of-way.
- Nearly 9,000 acres of variance is proposed directly adjoining Mojave National Preserve south and west of Baker. The Preserve forms the Southern boundary of the variance while the northern boundary is close to the proposed Soda Mountain Wilderness Area. This area is home to desert tortoise and kit fox and is an important habitat for dune dwelling species such as the Mojave fringe-toed lizard. This area is unique for its spring wildflower blooms of purple verbena and its hanging dune systems, which are sand dunes that form on mountain sides creating unique micro-habitats. Desert tortoise is present in this area.
- Variance lands located east of Nipton in Nevada along the SR 164 corridor cover dense, old growth Joshua tree, yucca, and black brush forest. Scientists believe expansive black brush cover may take 15,000 years to develop. This area is one of the most significant black brush stands in the Mojave. This site provides uninterrupted views of Mojave National Preserve's New York Mountains to the south and west.

Joshua Tree National Park in CA

- Lands surrounding Joshua Tree National Park to the east of the city of Twenty-nine Palms and to the south and east of the Marine Corps Air/Ground Combat Center have been identified as variance lands for future solar development under the Solar PEIS Supplement's

preferred alternative. Solar development on these lands would interrupt some of Joshua Tree National Park's critical wildlife corridors as identified by the SC Wildlands report, "A Linkage Design for the Joshua Tree/Twenty-nine Palms Connection." This development could also ultimately undermine local and regional tourism by denigrating the park's natural resources which are closely linked to gateway communities' tourist economies. In fact, in 2010, the 1.4 million visits to Joshua Tree National Park contributed almost 60 million dollars into local gateway communities. In a 2010 University of Idaho Visitor Use Study, visitor groups stated that protecting Joshua Tree National Park's views without development (90%) and wildlife (81%) were either important or extremely important to them. Solar development on these variance lands could disrupt wildlife corridors and mar scenic vistas that, in turn, would interfere with the key reasons tourists visit the Joshua Tree National Park and the High Desert Region of California. A map showing these wildlife linkages is attached to these comments and further illustrates how solar development in this area could harm regional planning efforts to protect critical connectivity corridors, as well as visitor experience at Joshua Tree National Park.

Another concern related to the designation of variance lands is the considerable financial investment that has been undertaken by local, regional and national land trust organizations. In the California desert, the Mojave Desert Land Trust is a landscape scale conservation partner to the NPS, BLM, DOD and the California Department of Fish & Game. To date, MDLT has invested more than $18.6 million to acquire 36,400 acres of land within desert national parks and designated wilderness areas managed by the BLM. MDLT has conveyed to the United States approximately 13,800 acres of public land valued at $6.2 million. Approximately $14 million of these acquisitions were completed with private donations. The consideration of variance lands may well impact MDLT's conservation investments to date and the wildlife linkages that keep them connected. This will have a significant and negative impact on both their existing investments and their ability to secure future funding.

<u>Death Valley National Park in CA and NV</u>

- Variance proposed on Death Valley National Park's eastern boundary, surrounding Devil's Hole and Ash Meadows National Wildlife Refuge, and along the Amargosa River corridor should be excluded. This region includes hundreds of thousands of acres along Death Valley's boundary and encircling Ash Meadows. The Amargosa Valley SEZ was reduced by 80% due to resource conflicts, and is recommended for complete removal. It is home to an overdrawn aquifer, the largest wetland in the Mojave, and the second highest concentration of endemic species in North America.

<u>Grand Canyon National Park in AZ</u>

- The remote lands north of the park all the way to the southern Utah border are a diverse and spectacular landscape, and seem unlikely to be a great place to locate a solar energy facility. The people who visit these lands for recreation enjoy the vast, primitive and undeveloped open space that has become rare, even in the West. The lands that the Secretary of Interior recently withdrew from new uranium claims, especially, are not where we would like to see industrial development of any kind. The Grand Canyon watershed is fragile, and not completely understood, and we ask that the uranium mining withdrawal areas, at least, have any variance lands removed. The setback from the National Park, as well as from Grand Canyon-Parashont National Monument, should be a good long distance.

- There is one variance area parcel south and very near to the Grand Canyon – this should be removed. It is just outside the south parcel of the uranium withdrawal, and within 10 miles of the park.

Wupatki National Monument in AZ

- There are variance land designations on BLM land adjacent to the east boundary of the monument, some south, and one north. Industrial development within the beautiful long-vista views of visitors to the monument would degrade the visitor experience at this monument.

Fort Bowie National Historic Site in AZ

- There are small parcels of variance lands immediately north of Ft. Bowie National Historic Site that could cause problems if solar plants were developed there. They are also pretty close to a BLM designated wilderness and are part of an important wildlife corridor between the Chiricahua and Dos Cabezas Mountains. Especially because of this wildlife corridor, we ask that all variance lands south of the Dos Cabezas Mountains Wilderness Area near the border of the Coronado National Forest be removed.

Saguaro National Park in AZ

- Variance lands adjacent to the northwest corner of the park's Rincon unit are in a horse-property residential area – a solar plant situated between a high-price neighborhood and a part of the park popular with horse riders and hikers would face insurmountable opposition. Between this park unit south to the BLM's Las Cienegas National Conservation Area is an important wildlife corridor that has been the focus of a multi-agency and private partner effort to protect; likewise an inappropriate place for variance lands.
- Southwest of the Tucson Mountain unit of the park are variance lands where solar plants would be clearly visible from both the park and from the Arizona-Sonoran Desert Museum – transmission line proposals in this area have faced stiff opposition from local residents, local governments and conservationists. Nearby variance lands, just south of these, are likewise ill-suited for development as they are adjacent or close to Tucson Mountain Park, a county-owned natural resource park.

Glen Canyon National Recreation Area in AZ and NV

- There are many variance lands around this vast recreation area – they should be removed, at least using a 15-mile from the border rule, and more properly farther than that because of the remote and beautiful landscape.

Lake Mead National Recreation Area in NV and AZ

- Likewise, there are way too many variance lands around this large recreation area, and because of its proximity to Las Vegas they will lure speculators into thinking they are appropriate for development. Most are not, and will be controversial, so it is best that they are eliminated from solar development consideration upfront and as a part of this process.

Great Basin National Park in NV

- The scattered variance parcels around the park, with a large amount near the town of Baker, are inappropriate for solar development. The ecologically important and scenic Spring

Valley, which is viewable just west of the 13,063-foot Wheeler Peak within the park, should be made off-limits to new solar.

Carlsbad Caverns National Park in NM

- The many scattered variance lands to the north of the park, at least to Highway 408 and perhaps father, should be removed.

White Sands National Monument in NM

- To the east of the monument, between highways 82/70 and 54, there should be no variance lands.

El Malpais National Monument in NM

- The variance lands to the monument's northwest, and immediate south, should be removed.

Chaco Canyon Culture National Historic Park in NM

- Variance lands to the park's north, and along the access road, Chaco Canyon Road (Highway 57), if developed, would seriously harm this special culturally important landscape, as well as the visitor's experience of this remote and magnificent remnant of an amazing ancient civilization.

Mesa Verde National Park in CO

- Solar development on variance lands to the north (on both sides of Highway 160) would impact everyone who visits this popular tourist attraction.

Great Sand Dunes National Park in CO

- Variance lands to the south of the park, across Highway 150, should be removed so as to avoid development that would impact the park and its visitors.

Hovenweep National Monument in CO and UT

- To the southeast and to the west, variance lands should be removed from the monument unit located in Utah.

Natural Bridges National Monument in UT

- Variance lands in all directions around this monument should be removed, especially those lands between the monument and Manti-La Sal National Forest.

Capitol Reef National Park in UT

- The many variance lands in the remote and rugged locations east of this park should not be promoted for industrial solar development and so should be removed.

National Historic Trails

- The routes of the Old Spanish National Historic Trail and the Juan Bautista de Anza National Historic Trail, both managed by programs of the National Park Service, should be protected from new solar development. Accordingly, we believe that variance lands of at least 5 miles on either side of the center line should be excluded from consideration. This is to both

protect viewsheds from the trails (and it could logically be a farther distance based on viewshed analysis) and because these trails have active constituencies that are concerned by industrial energy development along these routes.

- Other historic trails, stage roads, and stage routes, both those so designated by NPS or identified by state agencies or other competent authorities, could also cause conflict with proposed solar development. It seems prudent to remove a similar corridor protecting these trails from the variance lands. For instance, trails that have been mapped by Arizona State Parks include: El Camino del Diablo, Zuni-Hopi Trail, Mormon Honeymoon Trail, Palatkwapi Trail, Beale Wagon Road, Coronado's Route, General Crook Road, Chavez Trail, Overland Road, Hardyville Road, Ehrenberg Road, Phoenix Stage Roads, Black Canyon Stage Road, Kearny's Route, Butterfield Stage Route (which is currently under study for potential designation as a National Historic Trail), Cooke's Wagon Road (Mormon Battalion) and Santa Cruz Route.

IV. Proposed Variance Lands Put Threatened and Endangered Species and Other Sensitive Lands at Risk

Our three organizations share the concerns represented in the comment letter submitted by The Wilderness Society, NRDC, Sierra Club and other organizations that argue

> "the list of exclusion areas (Table 2.2-1) should be modified to include additional sensitive resources, especially citizen-proposed wilderness and all BLM-identified lands with wilderness characteristics, including those that the BLM is not currently managing to protect those characteristics."

We also agree with them that desert tortoise connectivity areas should be altogether excluded from variance. Additionally, we support their comments regarding permanent protections for non-development lands in Riverside East SEZ and the exclusion of variance lands in the former Pisgah Zone, on Catellus lands donated to BLM for conservation unless granted permission from The Wildlands Conservancy, and in areas identified as "Ecologically Core" by The Nature Conservancy.

We support and urge the further removal of roadless areas, areas without existing transmission, and those demonstrating wilderness characteristics in and outside of zones. Finally, our groups support BLM's no development areas within Riverside East and Amargosa Valley SEZ. These areas represent unique assemblages of desert forest known as microphyll woodlands, important desert tortoise populations and migration corridors, and regionally important water resources; consequently they each present high conflict for development.

V. More Effort Should Be Made to Engage Affected NPS Gateway Communities

National Parks are crucial economic drivers in rural gateway communities and present widely supported and well-branded locations to enact the Administration objectives such as America's Great Outdoors, Landscape Connectivity and Let's Move. Throughout the Southwest, small communities partner with and benefit from their association with National Parks. Parks bring tourists to these communities, creating job opportunities associated with serving visitors and with

supporting park operations. National Park employees live and reinvest in these communities, creating a positive economic and social feedback loop.

Our three groups have worked closely with many rural gateway communities, and many residents have publicly commented that projects proposed on these lands will create conflicts for water resources, diminish their quality of life, and impair scenic vistas that encourage destination tourism. Small communities throughout the Southwest have been beset with applications for renewable energy projects. While some may be supportive, relatively few applications for wind and solar occur in close proximity to larger desert communities. This places disproportionate responsibility and burden for small communities to shoulder the impacts of these projects. Examples of small communities surrounded by variance include Baker, Shoshone, Tecopa, Amargosa Valley, Wonder Valley, Landers and Twenty-nine Palms. We recommend that BLM exclude variance lands surrounding communities that consider variance to be economically harmful or in conflict with their vision for community well-being.

Shoshone and Tecopa have become the Southern Gateway to Death Valley and are supported by tourism to Death Valley National Park, the Amargosa River and Canyon and several adjacent wilderness areas. The Wild and Scenic Amargosa River flows through these communities and provides water for homes, recreation, and creates a riparian corridor home to resident and migrant bird species, rare, endangered, and endemic fish, frogs and mammals.

The Morongo Basin (Morongo Basin, Yucca Valley, Joshua Tree and Twenty-nine Palms) has a regional planning process called the Morongo Basin Open Spaces Group. This group has identified key wildlife connectivity corridors on proposed variance lands east of Twenty-nine Palms between Joshua Tree National Park and the Sheephole Wilderness Area (attached is the map). The Morongo Basin and the surrounding regional economy benefit greatly from the 1.4 million annual visits to Joshua Tree National Park. Recent data suggests that the park annually contributes 58.8 million dollars to the regional economy and creates 800 jobs.

Desert Center is surrounded by the Riverside East SEZ, and is home to residents who have consistently opposed industrial development in their backyards. Multiple projects have been approved in this area and other projects, including the country's largest landfill and a groundwater pump storage project, are pending.

In sum, we believe that the BLM should consider the impact that proposed projects will have on human and natural communities within an affected radius. Similarly, they should consider the cumulative impact multiple foreseeable projects in an identified area and time horizon have on resources and adjacent communities.

VI. Scientific Uncertainty Supports Need for Strong Mitigation and a Cautious Approach

To protect the long-term ecological integrity of national park units, DOI and DOE should closely consider both direct and cumulative impacts from potential new solar infrastructure. This is especially important due to the lack of information relating to desert species, vegetation, the cycling of nutrients and water and other areas of biological science where great uncertainty

exists. As such, we strongly urge the DOI and DOE to embrace the precautionary principle for those sensitive lands surrounding park units and potentially used as habitat by the Desert Tortoise, Amargosa Vole, Amargosa Toad, Mojave Ground Squirrel and other state and federally listed endangered species. We believe any mitigation plan included with the proposed construction of a solar project should address the full range of potential impacts, including light pollution and other impacts that could degrade the experience of park visitors, on desert resources and be made available for review and public comment early in the review process.

VII. Conclusion

We believe that the DOI and DOE should give further consideration to the Modified Solar Energy Zone (SEZ) Alternative that would focus development within discrete low-conflict lands. We believe that it best balances the need to make lands available for new solar energy infrastructure, while ensuring that national park units, other protected lands and sensitive desert landscapes are conserved. If the agencies select the Modified Preferred Alternative, we insist that public lands within 15-miles of units of the National Park System should be excluded from consideration unless the NPS determines they are appropriate for consideration under the proposed variance process. As we've already stated, this policy would help deter controversial projects in the future, so that mistakes made in the past relating to the permitting of poorly sited solar facilities near parks, do not occur again.

The Solar Energy Development PEIS will set the stage for guiding where new solar development takes place on public lands for decades to come. A thoughtful and long-term planning approach is essential to avoid needless conflict and harm to our priceless national park treasures. While some progress has been made, we continue to have serious concerns. It is essential that DOI and DOE not lose focus on being "smart from the start" as this process moves closer towards a ROD.

Units of America's National Park System were set aside for preservation so that future generations can enjoy what park visitors do today. Historian Wallace Stegner wrote that America's "National parks are the best idea we ever had. Absolutely American, absolutely democratic, they reflect us at our best rather than our worst." It is both DOI's and DOE's duty to ensure that America's greatest idea is not needlessly harmed by an important energy resource our nation desperately needs and that we so strongly support. It is not an either/or dilemma, and we remain committed to working with you to make this effort successful.

Thank you for considering our comments.

Respectfully,

David Lamfrom
California Desert Senior Program Manager

Kevin Dahl
Program Manager, Arizona Field Representative

Seth Shteir
California Desert Field Representative

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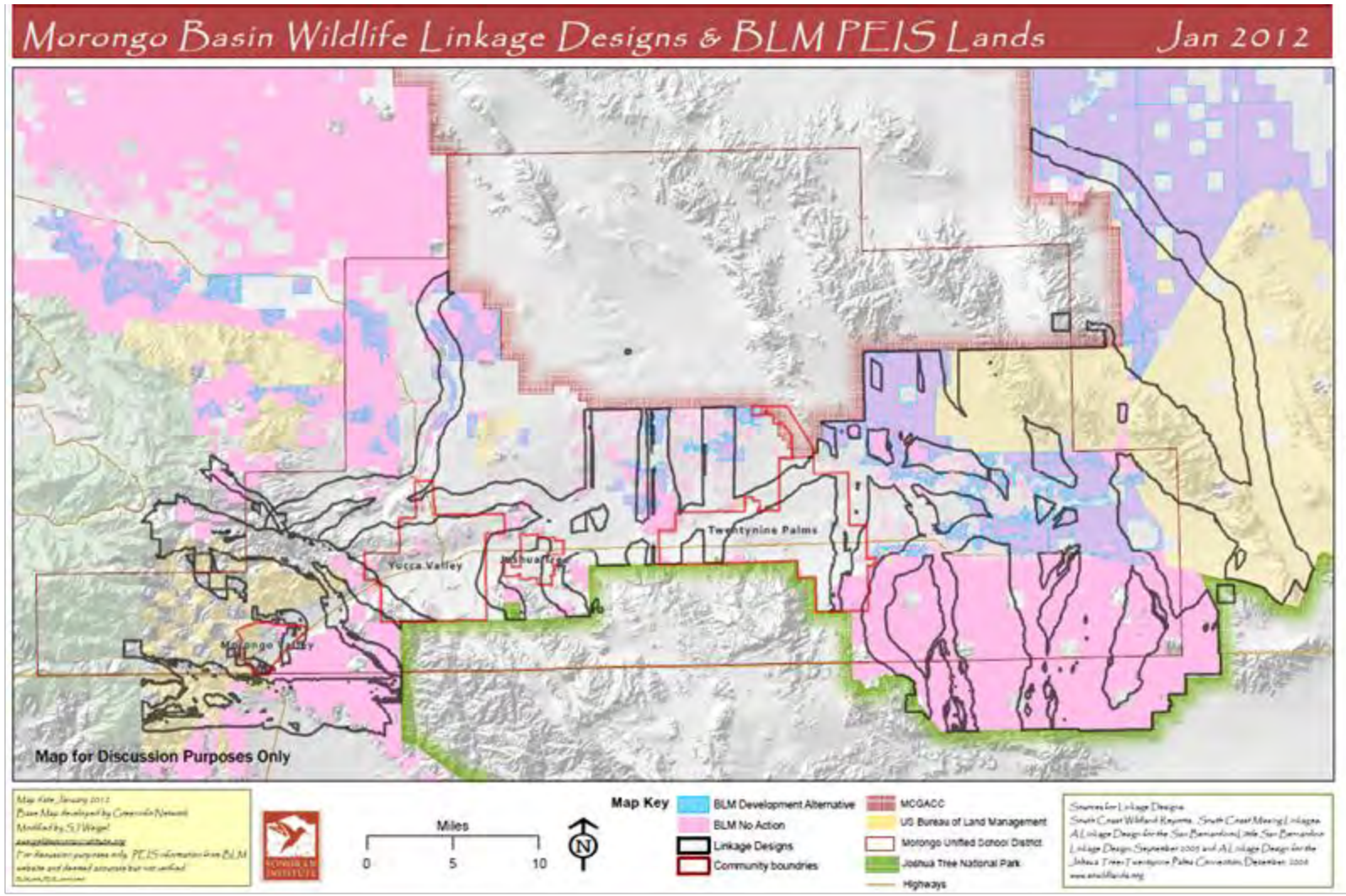
Morongo Basin Wildlife Linkage Designs & BLM PEIS Lands
Jan 2012
Yucca Valley
Twentynine Palms
Map for Discussion Purposes Only
Miles
0
5
10
Map Key
BLM Development Alternative
BLM No Action
Linkage Designs
Community boundries
MCGACC
US Bureau of Land Management
Morongo Unified School District
Joshua Tree National Park
Highways

Thank you for your comment, Erin Lieberman.

The comment tracking number that has been assigned to your comment is SEDDsupp20157.

Comment Date: January 27, 2012 18:40:46PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20157

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Attachment: Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Western States DoW Comment Letter 1 27 12 FINAL.pdf

Comment Submitted:

January 27, 2012

The Honorable Ken Salazar
Secretary of the Interior
U.S. Department of the Interior
1849 C Street, S.W.
Washington, D.C. 20240

RE: Comments on the Notice of Availability of the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States. 76 Fed. Reg. 66958 (Oct. 28, 2011)

Dear Secretary Salazar:

Thank you for the opportunity to comment on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Western States ("PEIS"). These comments supplement and amplify issues raised in a separate comment letter that Defenders of Wildlife ("Defenders") and the Sierra Club jointly submitted with NRDC, The Wilderness Society, and a number of other conservation organizations.

As we transition toward a clean energy future, it is imperative for our future and the future of our wild places and wildlife that we strike the proper balance between addressing the near-term impact of large scale solar development with the long-term impacts of climate change on our biological diversity, fish and wildlife habitat, and natural landscapes. To ensure that the correct balance is achieved, we need smart planning for renewable power that avoids and minimizes adverse impacts on wildlife and wild lands and effectively compensates for remaining, unavoidable impacts. We believe the Bureau of Land Management ("BLM") has taken an important, and impressive, step toward developing a framework for solar development on public lands that provides certainty for developers and necessary assurances for the conservation community. We are particularly pleased to see BLM's commitment to the concept of Solar Energy Zones; avoidance of high conflict areas; and incorporation of ongoing planning processes including the Desert Renewable Energy Conservation Plan and Restoration Design Energy Project.

Defenders and the Sierra Club highlighted our concerns on the Draft PEIS in comments submitted, along with 23 other conservation organizations, on May 2, 2011. In particular, we focused on the insufficient analysis of impacts on wildlife and made recommendations for improving upon that analysis and developing a comprehensive mitigation framework. Consistent with our recommendations, we are pleased to see BLM is addressing zone specific resource impacts and conducting additional analysis, including development of zone specific action plans for each of the zones that BLM carried forward. Given the scale and scope of development being contemplated under a solar program and the significant risk posed to wildlife, habitat and ecosystems by that development, however, BLM must incorporate

additional analysis and develop a successful mitigation structure and adaptive management framework to ensure the continued viability of wildlife on BLM lands.

Critical to the success of the Solar Energy Program is the need to gather data and conduct rigorous environmental reviews of wildlife impacts at the appropriate spatial and biological scales. Therefore, these comments focus on BLM's authority to manage public lands under the Solar Energy Program consistent with existing BLM wildlife policy. Baseline ecological information should be analyzed and landscape-level (e.g., ecoregional or watershed level) solar energy development and conservation strategies should be developed and integrated to achieve specific wildlife management objectives consistent with BLM policy. These objectives can be accomplished through proper siting of projects to avoid and minimize project impacts and through the development and implementation of effective compensatory mitigation plans for unavoidable impacts to species, their habitats, and important natural resources within that landscape. BLM must also adopt a robust and science based adaptive management and monitoring plan to ensure that implemented mitigation measures are effective.

Consistent with sound decision making is timely consultation with the U.S. Fish and Wildlife Service ("FWS") under Section 7 of the Endangered Species Act ("ESA"). Unfortunately, the Supplement provides limited information on the timing or mechanics of project-level Section 7(a)(2) consultations. We offer our comments and recommendations for how BLM should address this issue below.

Lastly, BLM must pay particular attention to the cumulative impacts solar development across 20 million acres will have on Desert Tortoise, a federally listed threatened species. We offer comments specifically tailored to the proposed Desert Tortoise Variance Requirements Option 1 and Option 2, and the proposed Desert tortoise connectivity habitats as shown on Figure 2.2-2. Following the comment period, Defenders intends to work with BLM and FWS on developing adequate protection requirements for projects developed outside of solar energy zones.

I. BLM Should Manage Special Status Species Consistent with Existing BLM Wildlife Policy

As noted in our comments on the Draft PEIS, the Solar Energy Program should be consistent with BLM wildlife policy, the purpose of which is to provide guidance to the agency in the conservation of the species, habitat and ecosystems found on BLM lands. In order to be consistent with agency policy, the Solar Energy Program should conserve habitat and wildlife and result in net conservation benefits to BLM Special Status Species.[1] Establishing measurable wildlife and habitat standards will increase public support for the program and enable the agency to evaluate the effectiveness of conservation and mitigation measures. BLM wildlife policies should be applied to this PEIS and the program it ultimately implements, which the agency has acknowledged is a land use planning process.

[1] These are species which are proposed for listing, officially listed as threatened or endangered, or are candidates for listing as threatened or endangered under the provisions of the Endangered Species Act (ESA); those listed by a State in a category such as threatened or endangered implying potential endangerment or extinction; and those designated by each State Director as sensitive. BLM Manual 6840.01

BLM Special Status Species policy, found in Manual 6480, has two broad objectives: to conserve and recover ESA-listed species and their ecosystems; and to proactively reduce or eliminate threats to Bureau sensitive species in order to minimize the likelihood and need of listing these species under the ESA. To achieve net benefits for Special Status Species, the agency should be able to demonstrate, through programmatic, zone and project analysis and monitoring, that the Solar Energy Program contributes to the recovery of listed species and improves the conservation status of Bureau sensitive species. Risks to Special Status Species must be evaluated and quantified at appropriate spatial, biological, and temporal scales.[2]

Manual 6500 establishes BLM wildlife policy "to manage habitat with emphasis on ecosystems to ensure self-sustaining populations and a natural abundance and diversity of wildlife, fish and plant resources on the public lands." Policy objectives call for the agency to "restore, maintain, and *improve* wildlife habitat conditions" on BLM lands, and to "*increase the amount and quality of habitat available.*" (emphasis added). Wildlife policy is also found within the BLM's Rangeland Health Standards. Agency regulations at 43 CFR, Subpart 4180 state that "[h]abitats are, or are making significant progress towards being, restored or maintained for Federal threatened and endangered species, Federal Proposed, Category 1 and 2 Federal candidate and other special status species."

In addition to BLM policy, under section 7(a)(1) of the ESA, BLM is explicitly obligated to utilize its existing authorities to affirmatively conserve ESA listed species. Section 7(a)(1) is designed to ensure that federal agencies "conserve" listed species, which means to improve the status of a species to the point where it no longer requires the ESA's protection. BLM policy requires developers to implement mitigation measures for impacted species.

We believe the aforementioned BLM wildlife policy and ESA obligations provide clear guidance for the BLM's solar program conservation objectives. Agency wildlife policy should be used to analyze and develop a solar program which will:

- Conserve and help recover ESA-proposed and listed species as well as candidate and other Special Status Species;
- Reduce or eliminate threats to BLM sensitive species and minimize the likelihood of listing these species under the ESA; and
- Ensure viable (i.e., self-sustaining) populations and a natural abundance and diversity of wildlife, fish, and plant resources on the public lands

These goals are achievable through smart planning and design without slowing the development of a growing solar industry or other energy development on BLM lands. In fact, careful planning that directs development away from the most important and sensitive places for wildlife and clarifies mitigation

[2] Analysis at the population level is consistent with BLM policy. For example, the 6840 manual calls for determining the "population condition" of sensitive species, and monitoring "populations and habitats" to determine whether conservation objectives are being met.

objectives will create greater certainty for developers and conservationists by providing clarity with regard to what wildlife management standards must be met and what mitigation measures must be implemented to achieve these outcomes. We believe that BLM should apply this standard to zone and project specific decision making. For example, where sensitive, threatened, and endangered species are present, BLM should demonstrate that development in zones, coupled with necessary mitigation measures, achieve a net conservation benefit.

With these specific goals in place for BLM Special Status Species, remaining impacts on individual species should be minimized and then offset through compensatory mitigation that creates benefits for wildlife in other appropriate locations.

II. BLM Must First Establish Clear and Consistent Conservation Goals for Landscapes Affected by Development or Proposed for New Solar Project Development

BLM and other federal and state agencies and non-profit organizations have conducted regional ecosystem and resource assessments that provide the foundation for evaluating resource conditions and establishing conservation strategies for protecting and restoring wildlife, habitat, and important natural resources. Using this baseline ecological information, landscape-level (e.g., ecoregional or watershed level) conservation strategies should be developed to achieve specific wildlife management objectives consistent with the standards described above – i.e., conservation of sensitive species and net conservation benefits for threatened, endangered, and Special Status Species through proper siting of projects to avoid and minimize project impacts and through the development and implementation of effective compensatory mitigation plans for unavoidable impacts to species, their habitats, and important natural resources within that landscape. It is important that BLM recognize that impacts on wildlife are not uniform. For some localized species, regional management is appropriate. For other wide-ranging species regional mitigation may not be appropriate. We expect BLM to address differing needs in the final EIS. We also ask that BLM provide greater detail on how ongoing conservation planning priorities and Recovery Plans will be incorporated. BLM has not made clear if, and how, design features and mitigation requirements under the Solar Energy Program will be consistent for species covered under those plans. Lastly, BLM should also clarify how the Solar PEIS interfaces with county-level zoning and open space policies.

While BLM is right to support large-scale conservation priorities through Regional Mitigation Plans, all Plans should be directly related to broader regional conservation plans. To achieve this over the long term, BLM should first consider existing State Wildlife Action Plans (SWAPS), current BLM wildlife management requirements and policies (discussed above), existing RMPs, and other relevant regional or local conservation plans. In addition, the BLM should work collaboratively with appropriate Landscape Conservation Cooperatives to obtain the benefit of local and regional knowledge regarding resource conditions and current wildlife management goals and strategies, as well as incorporating strategies for climate adaptation into specific regional mitigation plans. BLM and the FWS should work collaboratively to define a clear set of shared conservation priorities that guide decisions about where to develop and where to invest in conservation and/or restoration in the context of existing wildlife management strategies.

Ideally, the final PEIS would include maps associated with each SEZ that identify potential priority areas for habitat protection and restoration (i.e. Regional Mitigation Plans) consistent with established wildlife and natural resource management goals. This approach will help developers, conservationists, and state and federal wildlife agencies better understand how zone and project impacts will be mitigated and the associated costs of project development. It will also facilitate analysis of cumulative effects of solar energy development on landscapes and improve coordination among the varied interests who are affected.

The final PEIS should also identify species priorities for land and water acquisition for wildlife and plants that BLM already knows are likely to be affected by planned solar projects. Such an approach will create the certainty to allow more parties to develop mitigation options in advance before mitigation is needed. As discussed above, investments should be in priority conservation areas as determined by state wildlife action plans, regional conservation strategies, recovery plans, Nature Conservancy ecoregional assessments, or other credible analysis or plans that identify the areas of greatest ecological significance, and at a meaningful scale.

III. BLM Should Manage for Wildlife Consistent with Existing Policy Through Landscape Level Analysis that Addresses Conservation Objectives Through Proper Zone and Project Site Selection, Project Design, Effective Compensatory Mitigation, Consistent Monitoring, and Adaptive Management

A. BLM Should First Seek to Find Ways to Avoid Impacts Entirely and Minimize Additional Impacts through Project Design and Configuration

As is true with any project that could affect sensitive resources, agencies should seek first to find ways to avoid impacts entirely, minimize additional impacts through project design and configuration, and effectively mitigate those impacts that cannot be avoided. We believe that avoidance and effective mitigation can accomplish a net conservation benefit for BLM Special Status Species. It is important for BLM to acknowledge that where avoidance, minimization, and compensatory mitigation remain inadequate to achieve BLM wildlife policy objectives, development should not precede at either the project or zone level until this deficiency has been remedied.

In the draft PEIS, BLM failed to establish mitigation goals or requirements for resource impacts. Instead, the draft PEIS stated that mitigation will minimize impacts, but offered no supporting analysis. *See, e.g.*, DPEIS, p. ES-18 (Impacts to groundwater and surface water flow systems, water contamination, water quality degradation by runoff or excessive withdrawals "can be effectively mitigated"; DPEIS, pp. 5-24, 5-25, 5-26 (mitigation measures would reduce the level of impacts to soils from site characterization, construction, operations and decommissioning); DPEIS 5-41 (mitigation measures relating to site design, storm water, and avoidance of critical landscapes would reduce impacts relating to altered hydrology); DPEIS, pp. 11.1-61, 11.2-62,11.4-64 (land disturbance impacts to water resources "will be minimized"); DPEIS, Tables 5.10- 1, 5.10-2, 5.10-3, 5.10-4 (claiming an ability to mitigate impacts to ecological resources). In other cases, assertions that impacts can or will be

effectively mitigated are contradicted by statements elsewhere in the DPEIS. *See, e.g.*, DPEIS Tables 5.10-1, 5.10-2, 5.10-3, 5.10-4 (noting that overall it is relatively difficult to mitigate impacts to ecological resources).

While we understand that the specific mitigation requirements, and the actual ability to mitigate significant impacts to environmental resources, will not be known until BLM reviews specific projects, neither the draft nor the Supplement address which mitigation measures will be implemented, and if they prove to be ineffective, that other mitigation measures will be put in place. Effective mitigation should be based on landscape level analysis at a scale that is appropriate to the geographic area and resources of concern for a particular solar energy zone or project.

The final PEIS must contain analyses that estimate how or to what extent mitigation will reduce impacts – BLM must show whether and how mitigation will work, must provide a more accurate assessment of environmental effects and must temper its conclusions that impacts will be mitigated when it does not have supporting data. In addition, in describing an approach to mitigation BLM must address an adequate avoidance-minimization-mitigation hierarchy based, in part, on the risk to a species from ineffective or failed mitigation (e.g., low success with mitigating for desert tortoises). In particular, mitigation measures should be specific to the wildlife species and other resource impacts that will occur. BLM offices need a clear standard for review of mitigation projects that require a clear description and quantification of wildlife impacts and offsets.

B. BLM Must Develop Clear Guidelines and an Effective Strategy to Mitigate Those Impacts that Cannot be Avoided

Understanding that in certain circumstances impacts cannot be avoided, and that where BLM determines that unavoidable adverse impacts can be addressed through habitat restoration and/or acquisition and the project can proceed, BLM must adopt a consistent approach to compensatory mitigation.

A compensatory mitigation hierarchy should follow the approach below.

1. *Where compensatory mitigation is warranted, lands and resources should be acquired and/or restored on the same landscape and, more importantly, in the same ecosystem or watershed that will be impacted by the project or development.* The purpose of mitigation is to avoid, minimize, and compensate for project impacts on wildlife, wild lands, and important natural resources. To ensure the continued viability of affected species and/or provide a net conservation benefit toward achieving recovery of candidate, threatened, and endangered species, compensatory mitigation should be targeted toward actions that will improve habitat and/or resources, preserve connectivity, and produce other benefits for wildlife populations in the affected area. For most projects, this is likely to be in the same watershed or landscape as the project to be mitigated. For wide-ranging species, this may not necessarily be the case. However, all compensatory mitigation should be designed and developed consistent with existing wildlife management plans (e.g., SWAPs) and the wildlife management policies and objectives for BLM stipulated above.

2. *Where non-federal lands in private ownership are available, the loss of federal lands and resources that provide habitat for threatened and endangered species and sensitive species should be successfully mitigated by the acquisition and permanent protection of currently non-federal lands and resources that provide better than equivalent benefits to wildlife.* BLM should place the highest priority on acquisition, restoration, and long-term management of private lands to mitigate remaining wildlife impacts that cannot be minimized. If newly protected lands are to be held in non-federal ownership, conservation values must be given similar permanent protection through deed restrictions and easements, and funding must be secured for long-term management of these lands. We believe the final PEIS should establish *a preference* for acquisition, restoration and management of private lands versus allocation of mitigation dollars to federal lands, while recognizing that in many cases it will be necessary to pursue mitigation measures on federal lands as well. In some locations such as Nevada, there is inadequate private land available for acquisition so the only possible mitigation is restoration, enhancement and permanent protective management of public lands.

3. *On federal mitigation lands, permanently protect conservation values.* If lands acquired for mitigation purposes are to be transferred to federal ownership, they must be protected from future development. The Supplement states: "To the extent that public lands are used to mitigate for the impacts of solar development whether in or out of the SEZs, the BLM will develop strategies to ensure that any mitigation lands are protected to provide enduring conservation benefits." Supplement, Solar PEIS 2-24, 25. We strongly agree and recognize that certain mitigation options provide these protections. One option by which to do so is to withdraw these lands from use under federal mining and other land use laws and cover them by a plan amendment that ensures long-term protection of their conservation values. This option, however, cannot guarantee protection in perpetuity, upon which the mitigation is based, since new plan amendments can alter the land management. Our preferred option is to require that third parties secure easements or enforcement rights through deed restrictions before property is transferred to federal ownership.

   In either case, this additional protection is necessary because federal lands face extraordinary energy development and other pressures, and mitigation efforts will fail if an acre protected today, in compensation for a loss elsewhere, is developed and made unsuitable to wildlife through some future project or administratively authorized activity. Future mining, energy development, grazing and other non-compatible uses need to be prohibited using legally effective means (e.g. deed restrictions with enforcement rights held by third parties).

   To the extent that mitigation occurs on public lands, BLM must take measures to ensure it is not offering mitigation at below-market costs compared to mitigation options on private lands and that it is not simply using private funding to pay for activities which it (or other agencies) already has an obligation and duty to carry out.

   In particular for endangered species, federal agencies have special duties under the Endangered Species Act to affirmatively use their authorities to promote endangered species conservation. To

prevent the public from essentially subsidizing the costs of mitigation, BLM needs to ensure that private funding does not simply substitute for public funding for land management activities on a parcel now being used to mitigate solar impacts.

4. *On federal and non-federal mitigation lands, require endowments to ensure the perpetual management of mitigation lands.* The protection of land hosting affected wildlife populations or the restoration of such lands to better support wildlife will mitigate impacts only for as long as the wildlife populations endure. The final PEIS should be used to establish guidance on the establishment and transparent operation of regional or other large-scale endowments to maintain mitigation values over time. An established mitigation lands endowment program between the California Department of Fish and Game and the National Fish and Wildlife Foundation is a good model for what is needed under this PEIS. These funds should be set up to serve one or multiple solar development zones. This premise of establishing a perpetual management endowment is well established in federal conservation banking policy and in some state law and policies. It would be inappropriate for BLM to hold private land projects needing Section 10 incidental take permits under the ESA to a higher mitigation standard than for those projects occurring on public lands. We do not believe that such mitigation funds, whether maintained for the management of public or non-public lands, should be held by a federal entity.

5. *Land acquisition is inadequate to meet a net conservation goal and must be supplemented with species restoration and management activities and funding.* Land acquisition by itself may not satisfy a net conservation benefit standard for particular species because it may simply result in the protection of a wildlife resource that is already present or may fail to address current critical stressors affecting the wildlife resource. We believe most mitigation projects should include a significant commitment to restoration and long-term management, allocating mitigation dollars to actions that significantly enhance sensitive, threatened and endangered wildlife and plant populations. Such projects create a positive change in populations that can help offset direct and incidental losses of individuals and local populations on solar development sites. Establishing a priority on management and restoration through this PEIS also creates a clear signal which would incentivize the creation of private mitigation banks to secure and begin implementing such restoration in advance of actual mitigation plans being established for future projects. Permanent retirement of grazing permits should be included among activities that could result in restoration of habitat for affected wildlife.

6. *Improve certainty for developers and improve wildlife benefits by creating expansive service areas for mitigation, pooling mitigation funds and using a transparent and competitive process to allocate resources to affected species conservation efforts*

   Project-by-project development of mitigation formulas and identification of mitigation projects is a wasteful system whose flaws have already been documented in case studies of wetland mitigation and endangered species banking. This process also creates higher costs and lower certainty for companies. In our comments on the Draft, we recommended the final PEIS include explicit direction to ensure that mitigation efforts will be coordinated within a large “mitigation

service areas" (MSAs) – designed to be consistent with the ecological areas, watersheds, or species habitat needs for the wildlife, habitats, and natural resources to be protected or restored to compensate for project impacts.

We are encouraged to see BLM move forward with proposed Regional Mitigation Plans, a concept similar to the recommended MSAs. We believe these Plans will provide greater incentives for development in proposed and future zones. Consistent with our recommendation, BLM noted that these Plans can be used to "enhance the ability of state and federal agencies to invest in larger-scale conservation efforts that benefit sensitive species…[for] better long-term protection." Supplement Draft EIS, 2-24. To adequately develop effective mitigation plans, BLM will need to conduct landscape level analysis at a scale that is appropriate to the geographic area and resources of concern for a particular solar energy zone or project. Effective off-site mitigation would require sufficient analysis to ensure that proposed off-site mitigation is commensurate with the loss of habitat and ecosystem function in areas proposed for development.

C. Proper Management and Mitigation Require Robust Monitoring and Effective Adaptive Management

A recently published review paper by the United States Geological Survey (Lovich and Ennen 2011) reveals a concerning dearth of information in the body of scientific literature quantifying impacts of large scale solar energy development on wildlife populations. Its findings underscore the need for scientifically sound monitoring and research to be conducted in order to gain a reliable understanding of these impacts. Lovich and Ennen (2011) conclude:

> On the basis of our review of the existing peer-reviewed scientific literature, it appears that insufficient evidence is available to determine whether solar energy development, as it is envisioned for the desert Southwest, is compatible with wildlife conservation…The issue of wildlife impacts is much more complex than is widely appreciated, especially when the various scales of impact (e.g., local, regional, global) are considered. Our analysis shows that, on a local scale, so little is known about the effects USSEDO on wildlife that extrapolation to larger scales with any degree of confidence is currently limited by an inadequate amount of scientific data. Therefore, without additional research to fill the significant information void, accurate assessment of the potential impacts of solar energy development on wildlife is largely theoretical but needs to be empirical and well-founded on supporting science.

In order for management decisions to be adequately informed moving forward, it is crucial that the BLM's nascent Solar Energy Program implement well designed empirical studies that will quantify the impacts of solar development on wildlife populations and their habitats, as well as adequately assess the effectiveness of mitigation measures and strategies that are implemented in an effort to compensate for these impacts.

Effective monitoring, mitigation, and adaptive management are foundational to a successful BLM solar development program; without them, development will be needlessly inefficient, contentious, and

disruptive. Although the Special Status Species analysis performed for SEZs in the Draft PEIS and expanded to cover all alternatives in the Supplement provides a useful screen to highlight conflict areas and make ballpark comparisons of the various alternatives, the detail needed to evaluate the monitoring and adaptive management framework has been deferred until the final PEIS. Our detailed recommendations with respect to Monitoring and Adaptive Management of the Solar Energy Program can be found in Appendix 1.

Data to determine the current condition (i.e., ecological baseline) of wildlife, lands, and resources where solar project development and SEZs are proposed is essential to ensuring that wildlife management goals can be achieved. So, too, is the ability to monitor the effectiveness of mitigation measures in relation to wildlife and resource management goals, and to determine if past investments in mitigation have been effective, adequate, or if mitigation strategies need to change due to past failures or changing resource conditions (e.g., climate change). DOI agencies have too often failed to establish clear and measurable biological objectives in their own work and in requirements of third parties seeking agency approval. The absence of objectives feeds into problems with inadequate monitoring. The result is that too many projects fail to adequately compensate for impacts, and DOI agencies have a poor record of being able to track such performance. While the Draft PEIS lacked assurances that implementation and effectiveness of mitigation measures will be monitored, the BLM did provide additional detail in the Supplement. Monitoring resource conditions and the effectiveness of mitigation efforts is also an essential element in setting mitigation priorities, particularly if mitigation options are viewed across a large Regional Mitigation Plan.

Additionally, to evaluate the cumulative impacts on species and other resources, and to compare impacts of different solar projects, locations and technologies, monitoring protocols should be standardized within the appropriate biological scale for all projects, including transmission and related substations. Some protocols may need to be tailored (and thus different) for different ecosystems, watersheds or species. All monitoring data should be made publicly available in data sets with a common format (recommended by leading scientists who want to conduct studies) that may be easily downloaded and utilized by researchers and the public at large. This transparency will enable timely and robust evaluation of program impacts, efficacy of mitigation measures, and full engagement of the scientific community.

The BLM must use the final PEIS to define the types of outcomes (population size, viability, reproductive performance, age class distribution, etc.) that it will require from mitigation. Additional final PEIS analysis should describe the expected results of mitigation and how it will serve to guide any monitoring program that BLM and applicants implement. “Monitoring is fundamental for ensuring the implementation and effectiveness of mitigation commitments, meeting legal and permitting requirements, and identifying trends and possible means for improvement.” 76 Fed. Reg. at 3849. BLM must establish clear requirements for monitoring and reporting – to the public and the agency – on the success in achieving those goals. The monitoring program should also provide for public involvement. 76 Fed. Reg. at 3851.

It is critical that BLM consider the best available science, previous agency efforts, and a full range of public comments to devise the best system for integrating monitoring, adaptive management, and

mitigation. The recommendations included in Appendix 1 below build off of information and references provided on pages 2-13 and 2-14 of the Supplement, and are intended to flesh out the general elements and structure that would be needed for a scientifically rigorous and defensible strategy.

The Record of Decision for the Jack Morrow Hills Coordinated Activity Plan, prepared by the The Rock Springs WY BLM Field Office, contains an adaptive management approach we believe BLM should incorporate into any adaptive management plan for the Solar Energy Program. Appendix 2 (Implementation, Monitoring, and Evaluation Process) provides the specificity needed to evaluate the planned adaptive management program (and is available on line at http://www.blm.gov/style/medialib/blm/wy/jmhcap/rod.Par.37876.File.dat/02appendices.pdf).

We particularly note the following, as examples of the sort of detail that should be contained in any and all adaptive management plans created pursuant to the Solar PEIS:

- Table A2-1 Resource Management Indicators - p. A2-7 – contains a broad set of indicators
- Table A2-2 Indicator Detail - pp. A2-8 – A2-10 – contains multiple sources for data
- Table A2-3 Measurement Detail - pp. A2-11 – A2-13 – contains measures of change and triggers for management actions
- Figure A2-2 CAP Management Process - p. A2-15 – provides a useful illustration of the adaptive management process

In addition to setting out a comprehensive set of measurements, triggers for action, and a range of actions that will be taken to meet the standards set out below, a defensible monitoring and adaptive management program must be based on a thorough understanding of ecosystem processes based on detailed conceptual models, pilot studies to define sampling intensity and study design, an optimal set of indicators based on a set of accepted criteria, full involvement of a wide range of experts and stakeholders, and a defined framework to correct monitoring and adaptive management as needed. These issues are discussed further in Appendix 1.

Further, BLM must commit to monitoring and adaptive management and criteria for key resources, such as BLM Special Status Species, lands with wilderness characteristics, wild and scenic river segments and ACECs. Indicators can include the status of wilderness characteristics, outstanding river values, and the relevant and important values for which ACECs have been designated in the Final EIS.

D. BLM Must Consider the Impacts of Climate Change in Assessing Impacts from the Solar Energy Program on Wildlife

The warming of the climate due to greenhouse gas emissions underscores the need to rapidly advance deployment of renewable energy sources that do not emit carbon dioxide. At the same time, climate change poses such a threat to species and ecosystems that steps must be taken to ensure that development, even solar energy development, does not further threaten sensitive natural resources or hinder their ability to adapt to a changing climate.

Executive Order 13514 of October 5, 2009, directs all federal agencies to participate in the development of a national adaptation strategy in response to the impacts of climate change. Further, Department of the Interior Secretarial Order No. 3289, as amended, directs the Department to "tak[e] the lead in protecting our country's water, land, fish and wildlife, and cultural heritage and tribal lands and resources from the dramatic effects of climate change that are already occurring…." It further states that the Department "***must*** [emphasis added] … conserve and manage fish and wildlife resources, including over 800 native migratory bird species and nearly 2,000 federally listed threatened and endangered species…." A June 3, 2011 memorandum from the Deputy Secretary of the Interior to Assistant Secretaries and Heads of Bureaus and Offices further directs the completion of a Department-wide climate change adaptation plan by June 4, 2012, consistent with CEQ guidelines and states that:

> Climate change adaptation planning is needed to address the effects of climate change that Impact the Department's mission, programs, operations and assets, including our infrastructure and the land and water resources under our responsibility. Climate change adaptation is a critical complement to climate change mitigation. Climate change mitigation is an important undertaking that the Department is addressing in a number of ways including, in particular, through our support of renewable energy development on public lands.

In 2009, Congress called upon federal, state and tribal agencies to collaborate to develop a national strategy to safeguard fish, wildlife, plants, and their habitats in the face of a changing climate. BLM is a steering committee member on the National Strategy team, along with all the other major federal land, water, and wildlife agencies, and state and tribal natural resource managers. The Strategy, released in draft form on January 20th, provides a framework "to enable natural resource professionals and other decision makers to take action to conserve fish, wildlife, plants and ecosystem functions, as well as the human uses, values and benefits these natural systems provide, in a changing climate."

The Strategy outlines seven key Goals, three of which are relevant to BLM in the siting, development, and mitigation of solar energy generation facilities:

Goal 1: Conserve habitat to support healthy fish, wildlife and plant populations and ecosystem functions in a changing climate. Keys to this strategy include identifying and protecting an ecologically-connected network of lands and waters that will support a diverse array of habitats and wildlife, and allow species maximum opportunity to shift naturally with climatic changes. The Strategy also calls for restoring habitat and establishing new ecological connections where needed.

Goal 2: Manage species and habitats to protect ecosystem functions and provide sustainable cultural, subsistence, recreational, and commercial use in a changing climate. Climate considerations should be incorporated into land management plans at multiple scales, from the local to landscape and state level. Species and habitats vulnerable to climate change should be identified and managed accordingly.

Goal 7: Reduce non-climate stressors to help fish, wildlife, plants and ecosystems adapt to a changing climate. Existing stressors to species and habitats, including habitat loss, fragmentation and degradation, overuse, pollution, invasive species, pests and diseases, should be minimized to the maximum extent

possible. These stressors have been demonstrated to cause imperilment and extinction even in the absence of climate change. Even worse, many of these interact with and are worsened by warming climate conditions.

The BLM should address the issues associated with climate change and implications for water resources, wildlife and their habitats in the context of the final PEIS. Land and water management plans for solar facilities and associated infrastructure should incorporate climate change considerations. Specific adaptation strategies and management direction consistent with the national adaptation strategy and the forthcoming Department-wide climate adaptation plan should be incorporated into specific RMPs as amended by the final solar PEIS.

VI. Consultation with the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act is a Prerequisite for Sound Decision Making

We are encouraged to see that BLM is working with the U.S. Fish and Wildlife Service and is moving forward with Section 7(a)(1) and 7(a)(2) consultation. The Supplemental PEIS, however, provides limited information on the timing or mechanics of project-level Section 7(a)(2) consultations. For example, it is unclear how guidance from these programmatic Section 7 consultations will be incorporated into project level Section 7(a)(2) consultations. It is also unclear whether, and if so, how BLM and FWS will seek to integrate programmatic and project-level consultations through tiered or appended consultations. FWS and BLM should provide stakeholders with greater clarity on how they plan to comply with section 7 requirements, so that stakeholders can better anticipate future ESA requirements and provide input as early as possible.

Because the Solar PEIS will affect many listed species, BLM should view it as an opportunity to proactively improve the agency's implementation of the ESA. For example, ESA consultations typically do not link recovery objectives for listed species to section 7(a)(2) effect determinations, conservation measures, and reasonable and prudent measures and alternatives. BLM's section 7 consultation could address this deficiency by ensuring that no solar project approved under the PEIS undermines the recovery goal of any listed species. BLM can also improve its implementation of the ESA by working with FWS to ensure that the agencies properly track the *cumulative* take of any listed species. Doing so will allow BLM to partially verify its ability to achieve a net conservation benefit standard for listed species.

VII. Recommendations for Increasing Desert Tortoise Protection Measures in the Solar PEIS

In its revised recovery plan for the Mojave population of the Desert tortoise,[3] the FWS found that the species continues to face a moderate degree of threat which has increased since it was listed in 1990 as a

[3] U.S. Fish and Wildlife Service. 2011. Revised recovery plan for the Mojave population of the desert tortoise (*Gopherus agassizii*). U.S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California. 222 pp.

threatened species and since the first recovery plan was finalized in 1994. The FWS also found that the Desert tortoise has a low potential for recovery due to uncertainty surrounding management of threats to the species, and potential conflict with land uses and commercial development within its habitat. New and significant threats have emerged that the 2011 revised recovery plan does not address specifically. The primary of those threats is renewable energy development. Impacts of renewable energy development on Desert tortoises and their habitat could include "…habitat fragmentation, isolation of desert tortoise conservation areas, and the subsequent possibility of restricted gene flow between these areas." (Revised Recovery Plan, Preamble, p. iii). Implementation of a number of the recommended Recovery Actions, as articulated throughout the Plan, would make progress towards reducing threats associated with energy development (Revised Recovery Plan, Preamble, p. ii).

1. *Recovery Action 2.1, Conserve intact desert tortoise habitat* -Recommends that solar project facilities be sited outside Desert Wildlife Management Areas and Areas of Critical Environmental Concern, as well as the development of a cumulative impacts assessment to identify mitigation measures for this type of activity.

2. *Recovery Action 2.9, Secure lands/habitat for conservation* -Recommends conserving sensitive areas that would connect functional habitat or improve management capability of surrounding areas, such as inholdings within tortoise conservation areas that may be open to renewable energy development.

3. *Recovery Action 2.11, Connect functional habitat* - Recommends connecting blocks of desert tortoise habitat, such as tortoise conservation areas, in order to maintain gene flow between populations.

4. *Recovery Action 4.3, Track changes in the quantity and quality of desert tortoise habitat* - Recommends quantifying the loss or restoration of habitat as it relates to potential energy and other projects.

5. *Recovery Action 5.5, Determine the importance of corridors and physical barriers to desert tortoise distribution and gene flow* - This action, in part, would determine the effects of corridors and barriers like energy development, on desert tortoise movement and recovery.

However, the FWS cautions that additions to the Revised Recovery Plan will be necessary and included the following statement: "Still, the plan does not provide a single, comprehensive strategy for addressing renewable energy. To more comprehensively address this threat, the Service will soon add a renewable energy chapter to the living Plan that will act as a blueprint to allow the Service and our partners to comprehensively address renewable energy development and its relationship to desert tortoise recovery." (Revised Recovery Plan, Preamble, p. ii).

Recently a new species of Desert tortoise (*Gopherus morafkai*) has been identified[4] which reduces the distribution of the threatened *Gopherus agassizii* to about 30 percent of its former range. Because the reduction carries implications for species conservation, the authors argue that the Agassiz's desert tortoise may require a higher level of protection under the Endangered Species Act to ensure the level of management that would ensure its chances of survival and recovery.

Recommendations: Unfortunately, solar energy development authorizations and programmatic planning for future solar energy development is proceeding in the absence of a comprehensive strategy for addressing and resolving the issues associated with these activities, even in the Revised Recovery Plan. Thus, proceeding with precaution and erring on the side of conservation is prudent and essential for protection of what remains of the threatened Desert tortoise and its habitat and providing conditions under which it may eventually recover and no longer require the statutory protection afforded by the Endangered Species Act.

With the above in mind, we make the following recommendations for avoiding and minimizing impacts to the Desert tortoise and its habitat in California and adjacent portions of the Ivanpah Valley in NV:

1. Desert Tortoise Conservation Lands. We agree that in the California Desert Conservation Area, Desert Tortoise Conservation lands designated by BLM as Desert Tortoise ACECs (also known as "Desert Wildlife Management Areas" or "DWMAs") should be excluded from solar energy development. The exclusions should also include designated critical habitat and Wilderness Areas. It is equally important that all areas previously acquired by the BLM and other land managers for mitigation to offset impacts to tortoises should be excluded from consideration. Such compensation lands were acquired to offset significant impacts, some of which, like the Fort Irwin expansion, were regionally significant; to develop them now would serve to reverse their intended purposes.

Their development would necessarily require that U.S. Fish and Wildlife Service and associated federal lead agencies reconsider dozens of formal Biological Opinions, which would no longer function under integral assumptions at the time they were drafted. Catellus lands (colloquially known as "railroad lands") acquired by BLM is another category of lands that should be excluded from consideration for solar development, as they were intentionally acquired with conservation as their primary land management objective.

2. Proposed Variance Areas and Desert Tortoise Conservation. BLM seeks comments on two options for management of Variance Areas:

[4] Murphy, R.W., K.H. Berry, T. Edwards, A.E. Leviton, A. Lathrop A, and J.D. Riedle. 2011. The dazed and confused identity of Agassiz's land tortoise, *Gopherus agassizii* (Testudines, Testudinidae) with the description of a new species, and its consequences for conservation. ZooKeys 113: 39–71.

Option 1 – "No special variance application requirements for desert tortoise. The BLM will consider all variance applications within the range of desert tortoise on a case-by-case basis in coordination with the USFWS"; and

Option 2 – "For all applications in variance areas that are within the range of desert tortoise but located outside of proposed connectivity areas (see light blue areas in Figure 2.2-2), the applicant must provide documentation of the Project area has less than or equal to 5 tortoises (>160 mm Midline Carapace Length) per square mile. Based on the USFWS pre project tortoise survey, the point estimate for tortoises needing to be translocated would be less than or equal to 35 tortoises >160 mm Midline Carapace Length). The project is sited in a manner that maintains at least one 3 mile (5 km) wide, minimally disturbed connectivity corridor to ensure that the project does not isolate or fragment tortoise habitat and populations."

Comment on Option 1. This option will lead to continued loss of Desert tortoises and their habitats outside of proposed exclusion areas, described above, including landscape-level connectivity habitats that link conservation areas. Simply relying on USFWS coordination (i.e., Section 7(a)(2) consultation provisions of the ESA) will not provide adequate protection and conservation because the standard under such consultation will only be to avoid jeopardizing the continued existence of the species and avoid adverse modification or destruction of its designated critical habitat. Thus, this option will not contribute to the conservation (recovery) of the Desert tortoise.

This option is inconsistent with the Revised Recovery Plan for the Mojave Population of the Desert Tortoise, which calls for:
1) *Recovery Action 2.9, Secure lands/habitat for conservation* - conserving sensitive areas that would connect functional habitat or improve management capability of surrounding areas, such as in holdings within tortoise conservation areas that may be open to renewable energy development, and
2) *Recovery Action 2.11, Connect functional habitat* - connecting blocks of desert tortoise habitat, such as tortoise conservation areas, in order to maintain gene flow between populations.

The plight of the desert tortoise, more now than ever, requires certainty in coordinated conservation efforts. The 2011 determination that the Threatened population of the desert tortoise (*Gopherus agassizii*) now comprises a second species (*Gopherus morafkai*) suggests that protection of the Agassiz's desert tortoise, which is the species affected by the PEIS, is even more critical now than before the second species was described.

Option 1 is the same as the "No Action" alternative and should be identified as such. We do not support this option.

Comment on Option 2. This option is only partially consistent with the Revised Recovery Plan for the Mojave Population of the Desert Tortoise, which calls for:

1) *Recovery Action 2.9, Secure lands/habitat for conservation* - conserving sensitive areas that would connect functional habitat or improve management capability of surrounding areas, such as inholdings within tortoise conservation areas that may be open to renewable energy development; and
2) *Recovery Action 2.11, Connect functional habitat* - connecting blocks of desert tortoise habitat, such as tortoise conservation areas, in order to maintain gene flow between populations.

This proposed option fails to recognize that genetically important tortoises may occur in low density within otherwise high quality habitats. Desert tortoises may persist in these areas because they are uniquely (perhaps genetically) able to resist environmental factors that may have eliminated "less fit" tortoises, and they may persist because they have natural resistance to disease. To eliminate them because they occur in lower density would be a serious mistake in the context of tortoise recovery. Due to the effects of human activities on Desert tortoise populations and their habitats, and especially considering the documented dramatic decline in Desert tortoise densities throughout many areas within its range in California due to diseases, predation and other human related activities, the proposed criterion of limiting project consideration to areas containing up to five Desert tortoises per square mile may result in loss of otherwise high quality habitat and higher potential populations. Loss of these areas based on consideration of population density alone is insufficient. We do not support Option 2 as proposed, and offer a recommended Modified Option 2, below, that we believe will lead to minimizing loss and risk to Desert tortoises and less controversial outcomes.

Recommendation: Adopt a Modified Option 2.

We recommend that the USGS desert tortoise habitat suitability model and Desert tortoise density be used to provide interim criteria for areas where variance applications will be accepted but also recognize that development of a more detailed model is needed to guide conservation of the species at the appropriate scale required for solar project siting. The USGS desert tortoise habitat suitability model was intended to provide guidance for conservation planning at the range-wide scale, and represents the most comprehensive effort to define suitable habitat for the species to date. The one kilometer cell size used for this analysis and the emphasis on topographical, soil, and meteorological data as predictors make the model useful for predicting at the landscape-scale, but they do not provide the needed precision for analyses at the sub-regional scale or at the solar project sitting level.

Until additional refinement of a habitat model is completed by FWS, the following criteria should be met:

For applications in variance areas that are within the range of desert tortoise but outside of proposed connectivity areas, [as modified by our recommendations in these comments], the applicant must provide documentation of the following:

- Project area has less than or equal to 2 tortoises (>160 mm Midline Carapace Length) per square mile; and

- Where Habitat Potential Index Value is 0.7 or greater, verification that the habitat condition is "highly converted."[5] This verification should be provided through application of science-based models of land conditionor through field inspection.

Our recommended criterion of two adult Desert tortoises per square mile is based on current range-wide density estimates within recovery units that range from three to 36 per square mile.[6]

The predicted habitat suitability rating of 0.7 and above (on a scale of 0 to 1.0) is significant because 95% of the lands with a rating of greater than 0.7 in the USGS habitat suitability model also had confirmed presence of Desert tortoises based on field survey data. This habitat model, based on 10 environmental factors that included soils, vegetation, precipitation, elevation, and topography, is a sufficiently robust, science-based model, for interim land use planning and conservation planning for the Desert tortoise and its habitat, but further refinements are needed to make habitat suitability predictions more accurate and precise, both to protect important habitat as well as to ensure that areas not important for the species are not mis-identified.

Pursuing a model at finer scales would require the use of variables that directly or indirectly assess the resources used by tortoises when selecting habitat, such as presence of plants used for forage, vegetation diversity, density of annuals vs. perennials, and so on In addition, habitat connectivity analyses must be integrated with habitat suitability analyses in order to ensure that the focus is on preserving suitable and occupied habitat that is connected with other population areas as well as to ensure these connectivity areas themselves are preserved to provide meta-population persistence. The USGS desert tortoise habitat suitability model does not account for urban development, habitat destruction/fragmentation, or natural disturbances that have lowered habitat quality in recent years. Thus, we recommend using The Nature Conservancy's (TNC's) Mojave Desert Ecoregional Assessment[7] and the Conservation Biology Institute's Framework for Effective Conservation Management of the Sonoran Desert in California[8] to exclude these lands as having little or no habitat or conservation value. We recognize that it may be necessary to verify the habitat condition through field inspection and to accurately assess the adult Desert tortoise density. We also recognize that modeling of suitable Desert tortoise habitat needs to be refined through further field study and analysis, and that

[5] "Highly converted" refers to urban, suburban and agricultural lands that are heavily altered. While some can support conservation targets, their ecological context is highly compromised.

[6] U.S. Fish and Wildlife Service. 2010. DRAFT Range-wide Monitoring of the Mojave Population of the Desert Tortoise: 2010 Annual Report. Report by the Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service, Reno, Nevada. 49 pp.

[7] Randall, J. M., S.S. Parker, J. Moore, B. Cohen, L. Crane, B. Christian, D. Cameron, J. MacKenzie, K. Klausmeyer and S. Morrison. 2010. Mojave Desert Ecoregional Assessment. Unpublished Report. The Nature Conservancy, San Francisco, California. 106 pages + appendices. Available at: http://conserveonline.org/workspaces/mojave/documents/mojave-desert-ecoregional-2010/@@view.html.

[8] Conservation Biology Institute. 2009. A Framework for Effective Conservation Management of the Sonoran Desert in California. Prepared for The Nature Conservancy. 78 pp. + appendices

updated models should be developed soon and applied to our recommended criteria in Variance Areas as they become available.

Successful recovery of the desert tortoise requires that existing populations and their higher rated habitats are protected from deleterious human impacts. If recovery actions are successful to the point of promoting population increases, lands included in our recommended Modified Option 2 where solar energy development would be inappropriate could be the very areas into which newly recruited tortoises would need to move in response to climate change or simply expand their population in response to successful recovery efforts.

3. Desert Tortoise Connectivity Habitats. Connectivity or linkage habitats for the Desert Tortoise are also addressed by BLM, as follows:

> For all applications in variance areas within the range of desert tortoise and within proposed connectivity areas (see red hatched areas in Figure 2.2-2), siting will be discouraged given anticipated high conflict.[9] However, if a variance application is submitted in this area, applicants will be subject to the translocation limitations and maintenance of minimally disturbed connectivity corridors as described above. In addition, applicants will work with the BLM and FWS to survey an area 3 to 4 times larger than the proposed project area in an attempt to find a suitable project location that meets all of the following criteria:
>
> - Projects will be sited in the lowest tortoise density area surveyed and will not exceed 2 tortoise per square mile.
> - Projects will be sited in locations where native vegetation communities are degraded or soils are compacted, such that habitat restoration potential is low.
> - Mitigation for projects within the tortoise connectivity areas should be prioritized to improve condition within the connectivity area and if these options do not exist, mitigation should be applied toward the nearest tortoise conservation area (e g., Desert Wildlife Management Area [DWMA] or critical habitat).

Comment on Connectivity or Linkage Habitats. The basis for BLM's proposed connectivity habitats was not provided. Thus, it is not possible at this time to provide a complete analysis of the adequacy of the impact minimization provisions. We strongly recommend that BLM's proposed connectivity habitats shown on Figure 2.2-2 be replaced with connectivity or linkage habitats recommended by the FWS in their comments on the Draft PEIS for Solar Energy Development, dated May 6, 2011, and that their recommendations be adopted in the final version of the habitat connectivity map in the Final EIS. Their recommendation is contained on Figure B-2 in the form of a map and narrative. We include it in our comments as Appendix 2. It is important to understand that their recommendations identified lands to be included in a "…minimum linkage design necessary for the conservation and recovery of the Mojave population of the desert tortoise…."

Recommendation: Exclude Desert Tortoise Connectivity Habitat from Development

We strongly recommend that solar energy development be excluded from all Desert tortoise connectivity or linkage habitats identified by the USFWS, except in limited situations where BLM and the USFWS determine that solar energy development may be acceptable on lands that have been developed or highly fragmented and have little or no conservation/recovery value for the Desert tortoise. To identify such lands, we recommend using The Nature Conservancy's Mojave Desert Ecoregional Assessment in combination with the USFWS map of recommended linkage habitats. For areas falling outside their Mojave Ecoregion and within proposed Variance Ares, we recommend that BLM undertake a similar approach in identifying disturbed and highly fragmented lands. We make this recommendation because the Desert Tortoise Habitat Model, considered by the USFWS in developing their recommendation, does not reflect habitat lost or highly degraded or fragmented due to land uses such as urban development, roads, agriculture, mining, etc. We recognize that it may be necessary to verify the habitat condition through field inspection and to accurately assess the adult Desert tortoise density.

We additionally recommend that solar energy development not be allowed in two specific and important Desert tortoise connectivity habitat regions – Pisgah Valley in California and Ivanpah Valley in both California and Nevada. Both these areas are included in the FWS's habitat connectivity or linkage habitat recommendations, and we strongly recommend the remaining habitat in these essential areas be excluded from development.

The Revised Recovery Plan includes the following statement on page 35:

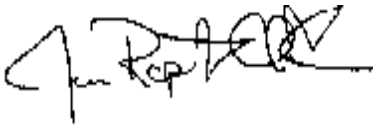
> It should also be recognized that activities occurring on lands beyond the boundaries of existing tortoise conservation areas can affect tortoise populations, important linkages between tortoise conservation areas, and the effectiveness of conservation actions occurring within the conservation area boundaries. Agencies should work within the context of their respective land use plans to determine how to effectively implement recovery actions contained within this plan.

Connecting Desert tortoise conservation areas by maintaining intact landscape-level habitat suitable for maintaining and enhancing Desert tortoise populations and promoting gene flow requires that these areas be conserved and protected. Many of these connecting habitats that link conservation areas are limited in size and functionality by habitat suitability and the effects of existing developments such as highways and canals.

We feel that the second bullet in BLM's proposal for management of connectivity habitats, which attempts to direct proposed projects to lands with degraded or disturbed habitats, has merit, provided that the criteria for what constitutes such land condition be clearly stated and accurately identified. Areas where natural vegetation cover has been significantly altered or removed and soils compacted to the degree that restoration to natural condition would be difficult, at best, should be identified so that project applicants can be directed to consider projects in these areas without compromising the conservation value of the connectivity or linkage habitats.

Thank you for your consideration of these comments. We look forward to seeing them addressed in the Final PEIS.

Sincerely Yours,



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Appendix 1: Monitoring and Adaptive Management

Key Concepts

The key concepts that would underpin such a program, outlined in BLM Technical Reference 1730-1 (Elzinga et al. 2001), are presented below in the context of the solar PEIS.

1. **Monitoring is driven by objectives** that describe the desired condition and define what is measured, how well it is measured, and how often it is measured. The purpose of adaptive management is to meet the objective, and the purpose of monitoring is to determine if the objective has been met. In this way, monitoring provides the crucial link between objectives and management.

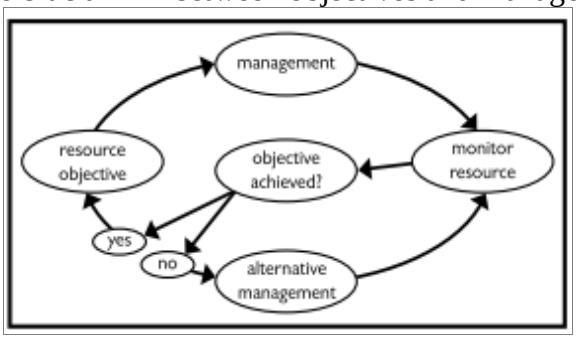

Figure 1: Effective adaptive management and monitoring are interdependent

When monitoring data are inconclusive, however, it becomes impossible to determine whether management is successful, and the adaptive management cycle breaks down.

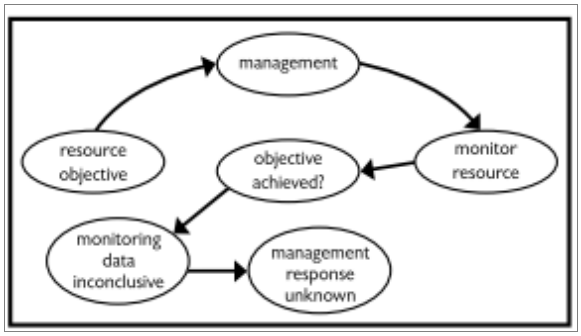

Figure 2: With inadequate monitoring, adaptive management isn't possible

As discussed by Noon (2002), monitoring programs that are intended to assess the effects of a certain type of development should perform three main functions. First, they must be able to discriminate between extrinsic and intrinsic drivers of change in order to be effective, acting as a filter to separate the effects of extrinsic change due to the development of interest from those of other human changes to the ecosystem while at the same time accounting for the three types of natural change: random variation, succession following natural disturbance events, and cyclic variation. Second, they must differentiate changes that can be accommodated from ones that degrade the ecosystem, and to determine the source of these changes. Third, they must identify the sources of negative change specific to the development of interest that cannot be incorporated within the natural dynamics of the system, exceed its resilience, and potentially drive it into a new state. These sources of negative change, or stressors (Suter 1993, Thornton et al. 1993, 1994), drive the formulation of monitoring objectives which in turn drive the selection of indicators.

One of the main goals of the BLM Solar Energy Program is to minimize the environmental, social, and economic impacts of development. Making this goal operational requires breaking it down into more specific objectives that directly relate to biological and abiotic resources. It is critical that these objectives be formulated using a process that incorporates broad scientific consensus and expert involvement from outside as well as within the agency; as noted by Nie and Schultz (2011), "built-in agency biases and political pressures influence what questions are asked in adaptive management, what controversies are avoided, and how information is collected, interpreted, and acted upon."

Villarreal et al. (2011) details the recent development of monitoring objectives for the Barry M. Goldwater Range West, an area located in southwest Arizona that is quite representative of areas that would be open to development under the BLM Solar PEIS. This monitoring plan was developed based on an evaluation of all monitoring plans in the Sonoran Desert region, and refined the monitoring objectives of these plans using a multi-agency process incorporating external stakeholder and scientific input. Comparison of a few of the initial monitoring objectives with those refined by the stakeholder group illustrates the value in developing consensus-based objectives that make management specific, targeted, tangible, and effective:

- "Manage to control invasive species" changed to "Identify (location, source and transmission), assess, eradicate, reduce, mitigate, and/or minimize problematic invasive species."
- "Minimize erosion (wind, water, and others)" changed to "Identify (natural events), avoid, and control problematic erosive and deleterious landscape impacts."
- "Rehabilitate where needed" changed to "Identify, restore and/or enhance degraded or impacted habitats."

We suggest the following **as examples** of additional objectives that relate to environmental impacts from solar development:

- Net conservation benefit or net benefit to recovery standard for all actions taken under the Solar Program that affect listed or candidate species, as measured by direct or indirect measures of population viability.
- Net conservation benefit or net benefit to recovery standard for all actions taken under the Solar Program that affect selected special status species, as measured by direct or indirect measures of population viability.
- No net loss of selected native vegetation cover types from solar projects (e.g. sagebrush, Joshua tree); vegetation loss would be offset by habitat enhancement projects for the same community in adjacent areas.
- No net soil loss or decline in PM-10 air quality standards.
- No net loss of areas that exceed some threshold of biological soil crust cover.
- No significant change in distribution or abundance of termite/harvester ant colonies.
- No significant change in the distribution or abundance of aquatic invertebrates.

2. **Monitoring is distinct from inventory or research;** it lies between the two on a continuum of study effort. The figure below details various study designs that could be associated with evaluation of a prescribed burn. In the figure a single inventory, defined as a point-in-time survey used to determine resource location or condition, is represented by one of the rectangles in the lower half of the figure. Clearly periodic inventories are the building blocks for a monitoring program, but without an overarching sampling design linked to a conceptual model of stressors and indicators, a series of inventories is just that.

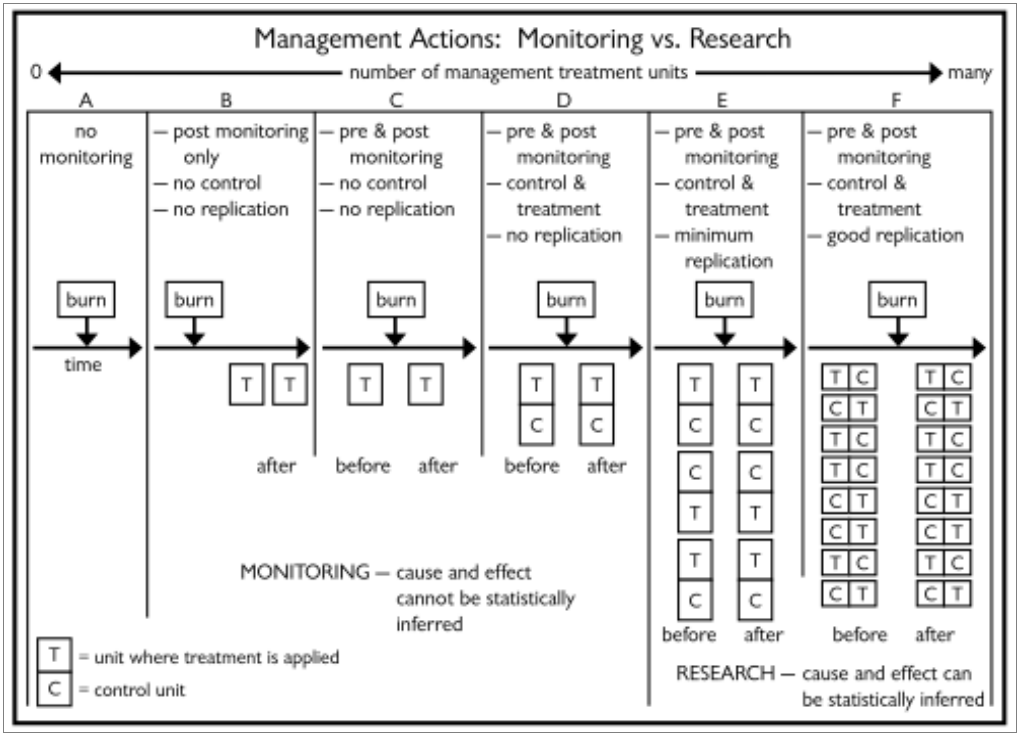

Figure 3: Monitoring is composed of inventories, with a structure informed by research

Monitoring designs are shown in columns B, C, and D of the diagram. The most rigorous is D; in this design, there are inventories before and after management, and these are performed in a treatment area where management occurs as well as in control/reference areas where management and disturbance does not occur. This design, using a set of treatment areas where solar development impacts occur and control areas where they do not, is the only one that would allow the effects of management to be fully explored. However, this level of inference also requires that cause and effect relationships be clearly understood through research studies, as represented by columns E and F. In these columns, treatments (burn areas) and controls (unburned areas) are replicated so the effects of management can be statistically verified. Without this verification there is no way to support that management is having the intended effect, or to rule out that some factor besides management is driving the observed change. So although monitoring programs are composed of repeated inventories, they also require research to validate indicator selection and underlying conceptual models to provide the structure to dictate how inventories occur in time and space. As noted by Noon (2002), by itself a monitoring plan cannot define the causes of change, decide how much change is acceptable, decide on threshold values that would trigger management actions, or avoid false conclusions that biologically meaningful change has occurred. Effective monitoring and adaptive

management requires both baseline data, as provided through sufficient pilot studies, as well as baseline research to inform how the monitoring framework will be defined; it is not possible without all of these components. As stated in the Department of Interior's Adaptive Management Technical Guide (Williams et al. 2009):

> It is thought by many that merely by monitoring activities and occasionally changing them, one is doing adaptive management…adaptive management is much more than simply tracking and changing management direction in the face of failed policies…an adaptive approach involves exploring alternative ways to meet management objectives, predicting the outcomes of alternatives based on the current state of knowledge, implementing one or more of these alternatives, monitoring to learn about the impacts of management actions, and then using the results to update knowledge and adjust management actions. Adaptive management focuses on learning and adapting, through partnerships of managers, scientists, and other stakeholders who learn together how to create and maintain sustainable resource systems.

Currently, most lands proposed for development under the BLM solar PEIS do not have sufficient inventory data to establish a baseline. However, BLM has recently introduced a set of Core Terrestrial Indicators to be used in their Adaptive Inventory and Management (AIM) strategy (MacKinnon et al. 2011); data acquisition for these indicators is ongoing or will start soon. These indicators were designed for general monitoring across all BLM lands, and will need to be supplemented with additional ones specific to the solar program. Similarly, despite the dramatic increase in the number of peer reviewed publications on renewable energy in the past two decades, environmental impacts and ecological implications of renewables have been much underrepresented, particularly with respect to utility-scale solar energy (Lovich and Ennen 2011). Research and consensus building to assess the basic impacts of solar power, develop indicators, and define protocols for their measurement should be highest priority, followed by completion of the first inventories for high priority development areas.

In this situation, guiding development to solar energy zones and potentially to focal areas within variance lands provides several advantages:

- By focusing baseline inventory work on selected areas it can be completed as quickly and efficiently as possible.
- By geographically concentrating the standardized, project-level data collection that follows, area-specific data libraries will accumulate that will allow research gaps to be filled, and this will streamline and facilitate future development through increased knowledge of impacts.

3. **Effective monitoring of biological resources must incorporate a mix of indicators** since stressors can be physical, biological, or chemical in nature (Noon 2002). In addition, some ecosystem properties or responses are relatively straightforward to monitor directly, others must be measured indirectly or inferred through surrogates (Leibowitz and Hyman 1999). Elzinga et al. (2001) define two main classes of indicators in reference to monitoring the status of species:

    - Resource monitoring directly quantifies some aspect of a species itself such as population size, average density, cover, or frequency, but has no direct link with the causes of population condition and trend; changes or current status could be the result of other factors besides management.
    - Habitat monitoring assesses how well habitat conditions meet objectives or management standards that are linked to documented relationships between habitat and species from the conceptual model.

    The key to a successful monitoring and adaptive management program is a diverse set of indicators that represent key components, processes, and stressors of ecological and management interest. Indicators should be selected based upon a conceptual model linking stressors and indicators to pathways that affect the structure and function of biological systems (NRC 1995, 2000).

Indicator Selection and Protocol Development

The adaptive management and monitoring section of the Supplement states that the AIM strategy will provide the monitoring foundation for the BLM Solar Energy Program. As stated above, however, additional indicators are needed to monitor impacts, define mitigation, and guide adaptive management for utility-scale solar projects.

The Core Terrestrial Indicators (MacKinnon et al 2011) in the BLM AIM strategy are:

1. Percent cover/proportion of bare ground per unit area.
2. Vegetation composition or percent cover/proportion by species or species group.
3. Percent cover/proportion of non-native invasive plant species.
4. Percent cover/proportion of plant species of management concern.
5. Height of dominant vegetation.
6. Proportion of soil surface in large, inter-canopy gaps.

AIM contingent indicators for specialized uses are:

1. Soil aggregate stability.
2. Significant accumulation of soil toxins.

These vegetation and habitat-based attributes, also known as “coarse filter” attributes, are at least two steps removed from the suite of species that use them; direct use of these to make inference to wildlife requires assumptions that are poorly studied and tenuous for most species (Noon et al. 2009). Creating a defensible monitoring system for the BLM Solar Energy Program would require additional indicators and associated data collection protocols, and these should be developed using a rigorous and inclusive collaborative process like that used for the National Park Service's Mojave Desert Network Vital Signs Monitoring Plan (Chung-MacCoubrey et al. 2008). This objective-driven monitoring system is based on a conceptual model developed with extensive scientific collaboration. The plan used an 8-step approach (not strictly sequential, and likely somewhat iterative) to identify, prioritize, and select indicators for the network of geographically disjunct parks included in the plan. This approach has been adapted below for the BLM Solar PEIS.

1. Identify ecosystem drivers, stressors, and important processes using a linked set of ecological conceptual models developed through multi-disciplinary collaboration between agency staff and research scientists.
2. Conduct a series of small workshops at the field office level to identify important resources, resource threats, management concerns, monitoring objectives and indicators for each.
3. Identify similarities and differences across field offices and summarize indicators, threats, management concerns, and monitoring objectives at the network-level.
4. BLM information review and synthesis at state and federal level.
5. Prioritization of indicators for each field office based on management significance, mandate, and their ability to meet monitoring objectives.
6. National-level scoping workshop, broadly attended by a wide range of stakeholders, to complete scientific review of system-wide indicators and associated information, prioritize indicators based on ecological significance, and define additional research and collaboration to needed to promote range wide conservation of high priority biological indicators (e.g. greater sage-grouse, desert tortoise).
7. Small workshops for field office staff to select an initial “short list” of high-priority indicators.
8. Final small workshop for field office staff to select a final, prioritized list of indicators that are standardized across field offices but also optimized to fit local monitoring needs.

NPS and partner groups completed this indicator selection process and initiated monitoring in the Mojave Desert Network within three years. Although the area monitored by this plan is over 28 times larger than the area associated with the BLM Solar PEIS Modified SEZ Alternative, it is only 40% as large as the area that would be covered by the BLM Solar PEIS Modified SEDP Alternative. Assuming a direct relationship between area covered and time required to initiate monitoring, the process above could be completed quickly for the small subset of lands in the SEZ alternative, the proposed Agua

Caliente and West Chocolate Mountains SEZs, and possibly other variance areas where there is high developer interest. Initiating monitoring on all lands in the Modified SEDP alternative, however, would take over seven years assuming a direct relationship between implementation time and area. This area comparison illustrates the logistical constraints that would come into play if designing a monitoring program for the entire Modified SEDP Alternative, which has 20 million acres distributed over six states, and further supports the need to focus monitoring and development on key areas.

As noted by Noon (2002), the ultimate success of a monitoring program hinges on the selection of appropriate indicators; if the wrong indicators are selected the program will fail, regardless of the level of funding or implementation. Initial criteria for selecting indicators are

- Sensitivity to changes in stressor levels and ecological processes
- Ability to provide information about the status of unmeasured resources
- Cost effectiveness

Additional desirable properties that are evaluated by data from pilot studies and simulations include

- Dynamics that parallel those of the larger environmental component or system of overall interest
- Short-term but persistent response to changes in environmental status
- Accuracy and precision (high signal to noise ratio)
- High likelihood of detecting changes in indicator magnitude with change in environmental status
- Low, or well understood, natural variability, with changes in values due to management or development readily distinguishable from changes due to background variation

BLM must take full advantage of the latest research, data, and analytical techniques in order to efficiently implement monitoring and indicator development for the Solar Program while maximizing cost-effectiveness as well as predictive power. The following recent research and data development projects are directly relevant to indicator development for the BLM Solar PEIS, and are representative of the type of information that must be fully considered in the indicator development process.

- **Frequently acquired, low resolution MODIS or AVHRR imagery to map plant phenology and structure,** using measures of plant growth and vitality in predictive wildlife habitat models for pronghorn (Wallace 2002) and yellow-billed cuckoo (Wallace et al. 2011) as well as to investigate perennial plant cover (Nussear et al. 2009) and plant

species distribution, particularly alien invasive grasses and forbs that exhibit different phenological growth patterns than native species (research ongoing, see page 14 of http://www.arizonanevadaacademyofscience.org/proceedings2008_vol43.pdf for details).

- **Use of AVHRR imagery to detect interannual vegetation change** over time (Li and Guo 2012) could be valuable to determine if plant communities near solar installations are changing relative to similar control areas located away from development.
- **MODIS imagery as a tool to classify grassland condition** by comparing signatures of intact native grassland to degraded grassland and monitoring change over time to locate deteriorating areas (Torregrosa 2011, Jiang et al. 2006).
- **"Fusing" imagery datasets** to achieve higher spatial resolution with frequently-acquired 250 meter and 1 kilometer resolution satellite data mentioned above (Walker et al. 2011) or to combine different types of data as done by Mundt et al. (2006) to map sagebrush using LIDAR and satellite imagery.
- **High-resolution IKONOS satellite imagery to predict habitat structure and seasonal habitat use** by Sonoran pronghorn antelope (Wallace and Marsh 2005).
- **High-resolution aerial and satellite imagery for mapping** invasive weeds, harvester ant mounds, and native vegetation (Yang and Everitt 2010, Fletcher et al. *In Press*, Fletcher et al. 2007).
- **Use of ground-based "phenocams"** along with satellite imagery to track phenological changes in sagebrush vegetation, water availability, plant productivity, then linking these factors to wildlife habitat use as USGS is doing on the Owhyee Plateau in Idaho, Oregon and Nevada (Torregrosa 2011).
- **Repeat Photography** as a monitoring tool to assess landscape and vegetation change over time at established photo points (http://www.nrmsc.usgs.gov/repeatphoto).
- **Airborne LIDAR** acquired from manned aircraft or UAVs (http://www.ars.usda.gov/is/pr/2011/110927.htm) to map vegetation height, bare ground, and biomass (Streutker and Glenn 2006, Mitchell et al. 2011), estimate erosion and dust emission potential after wildfire based on surface roughness (Sankey et al. 2010, Sankey et al. 2011), estimate tree cover (Sankey and Glenn 2011), and classify sagebrush communities (Sankey and Bond 2011).
- **Predictive habitat models** that model habitat suitability as a function readily available bioclimatic and physiographic variables have been used to define suitable habitat for a range of desert species (Boykin et al. 2008, Nussear et al. 2009) maintain habitat connectivity areas for species with limited vagility (Barrows et al. 2011), and predict changes in species distributions due to climate change (Barrows et al. 2011, also see http://www.mojavedesertlandtrust.org/research/2009%20JOTR%20final%20report_20091214.pdf).
- **Analytical methods that estimate wildlife density and abundance** from presence absence, count, or mark-recapture data for direct monitoring of wildlife populations directly or to feed into predictive habitat models (http://warnercnr.colostate.edu/~gwhite/software.html)
- **Predictive spatial models for soil crusts** to facilitate soil crust mapping and monitoring (Bowker et al. 2006).

- **Sediment and dust transport models** to model soil loss and air quality impacts from land disturbance (Sankey et al. 2008, Okin 2008), project the effects of dust deposition (Munson et al. 2010), as well as map sand dunes and model Aeolian sand transport (Hugenholtz et al. 2011).
- **Integration of land use and hydrological models** to simulate the impacts of land use change on channel discharge, evapotranspiration, percolation, surface runoff, transmission losses, water yield, sediment yield and precipitation (Norman et al 2010). This would be useful as a tool to predict impacts of development and to incorporate hydrological considerations into all stages of the solar development process.
- **GPS collar and landscape genetics research to define large mammal movement** patterns in order to site and manage projects to preserve landscape connectivity.
- **Recent efforts to integrate biological data across regions** such as the Western Governors' Association Critical Habitat Assessment Tools, data developed by the Scenario Planning Steering Group of the Western Electricity Coordinating Council, interagency efforts to share data through Landscape Conservation Cooperatives, efforts of NGO groups such as Freedom To Roam and The Wildlands Network should be assessed and relevant data should be incorporated.
- **Integration of previously gathered monitoring data,** such as BLM Ecological Site Descriptions, with newly gathered data using new statistical techniques that deal with data dissimilarities.
- **Use of genetic analyses** to determine population patterns, migration, and use of the landscape by wildlife species (Michels et al. 2001, Epps et al. 2007, Vandergast et al. 2007).

Sampling and Design Considerations

Once indicators are selected a sampling design is needed. This will require collection and analysis of pilot inventory data for all indicators in order to define data collection processes that provide sufficient replication across space and time and have the statistical power to detect biologically significant change. Sampling should be probabilistic so as to allow inference to the target population, and standardized, robust approaches like spatially balanced sampling (GRTS) should be used to maximize data utility. Particular emphasis should be placed on prioritizing sampling methods that are readily and efficiently implemented, but provide precise and unbiased estimates with associated estimates of statistical uncertainty.

Management and Mitigation Triggers

Triggers for management and mitigation sit at the bifurcation of the "healthy" adaptive management diagram at the beginning of the document. If well-defined triggers with appropriate thresholds are not in place for critical resources, management is not and cannot be adaptive. This required component of

adaptive management and monitoring in the BLM Solar Program will require extensive involvement and agreement among a diverse group of experts to develop.

Nie and Schultz (2011) see triggers as a means to bridge adaptive management science and theory with the need for political and legal accountability, providing greater certainty to land managers, politicians, and developers alike by bounding the adaptive management process. Their review of triggers in eight federal adaptive management natural resource plans concludes with five recommendations:

1. Adaptive management must include a clear feedback loop and result in learning that improves future mitigation and management. Methods for feeding information back into a structured decision-making process should be explicit and determined during the design of an adaptive management program.
2. Monitoring programs and triggered mitigation measures should include sufficient detail about desired conditions, what is to be monitored and when, where triggers are set, and what mitigation measures will be implemented over what time frame.
3. Triggers and resulting actions should be explicitly addressed in NEPA analysis, which can limit and/or narrowly define additional NEPA analysis that will be needed.
4. The responsibilities for designing, conducting, interpreting, and funding monitoring should be made explicit and up front, with uncertainties explored through a collaborative engagement process to ensure that monitoring is cost-effective, scientifically valid, and likely to yield useable information about resource effects
5. Decisions about trigger points and trigger mechanisms should be clearly explained and be made transparently; these decisions can be contentious because they hinge on values and priorities, but consensus is mandatory. Triggers can be structured as phased controls or as signals with various priority levels, and part of the consensus process is determining the optimum form of implementation.

Our lack of knowledge of the historic range of natural variation for most indicators makes the identification of triggers difficult. In addition, we lack knowledge of the potential existence of thresholds, or regions of change in the value of a stressor that generate disproportionate change in the value of an indicator or, more seriously, the larger ecological system (Noon 2002). Abrupt, nonlinear changes in ecosystems in response to perturbation have been documented (Connell and Sousa 1983, Knowlton 1992, Estes and Duggins 1995), and changes to new, alternative states have been reported for lake, ocean, reef, and desert ecosystems (Scheffer et al. 2001). In particular, anthropogenic disturbances not consistent with natural disturbance regimes may move ecological systems to unprecedented, alternative states (Holling 1986, Holling and Gunderson 2002). This makes the precautionary principle completely critical when values for triggers are being selected. For example, there is likely an extinction threshold for Mojave desert tortoise with continued habitat fragmentation and loss of habitat connectivity. Any indicator intended to track this must have an associated trigger set at a very conservative level to prevent this threshold from being reached; the more irreversible the potential

environmental loss, the more sensitive the trigger point should be (Noon 2002). These issues make it critical to involve the widest audience of experts and the broadest public process when defining triggers and associated management actions.

Cumulative Effects

Ecological thresholds are strongly related to the concepts of ecosystem resilience and resistance to change, as well as to cumulative effects. Noon (in prep) describes four types of cumulative effects with respect to two stressors A and B: additive, antagonistic, synergistic, and multiplicative.

Box 3.

Types of Cumulative Effects

Consider two stressors, A and B, and their possible interactions:

- Additive: effect = A + B
- Antagonistic: effect < A + B
- Synergistic: effect > A + B
- Multiplicative: effect >> A + B

The first two types work "normally" in that they either contribute together to an ecosystem effect or cancel one another out. Synergistic effects, on the other hand, work together to create an ecosystem effect that is greater than would be expected based on their magnitude, for example ecosystem effects from disturbance of soil and biological soil crusts in combination with invasive exotic plants. Multiplicative effects are even more intense, for example trophic cascades that result from the loss of a species at the base of a food chain.

Given the spatial and temporal extent of disturbance proposed under the BLM Solar PEIS as well as the potential for strong synergistic and multiplicative cumulative effects and the thresholds they introduce, a comprehensive cumulative effects analysis is mandatory for all SEZs and variance areas with strong development pressure. This will require monitoring and adaptive management like that depicted in the fourth scenario in Figure 3 (D), which requires extensive sampling of sufficient paired disturbed and undisturbed sites as implemented in Catlin et al. (2011), albeit on a much larger scale, as well as a

before-after-control-impact (BACI) study design that provides inference to the magnitude of change resulting from cumulative impacts while at the same time accounting for unrelated variation.

Conclusion

In the Supplement to the solar PEIS, BLM has made a commitment to develop an adaptive management and monitoring plan in coordination with potentially affected natural resource management agencies that identifies how impacts will be evaluated, the types of monitoring that will be performed, and science-based thresholds for management and policy modification. The plan will include a process by which changes will be incorporated into the Solar Energy Program, including revisions to policies and design features, and all changes resulting from adaptive management and monitoring will be subject to appropriate land use planning, environmental review, and/or policy development oversight. The plan will incorporate data from specific project evaluations as well as from regional long-term monitoring programs, and data and lessons learned about the impacts of solar energy project will feed back and be incorporated into the BLM's Solar Energy Program in the future.

These strong commitments have been made in the Supplement, but detail on all of the above has been deferred until the FEIS. Delivering on these promises will require an intensive collaborative effort that incorporates the latest science and integrates data over vast areas. These new developments tie in perfectly with ongoing efforts to create a defensible monitoring program across all BLM lands, however, and with proper planning and execution the monitoring and adaptive management program for the BLM Solar Energy Program can serve as both a model and a test bed for future efforts.

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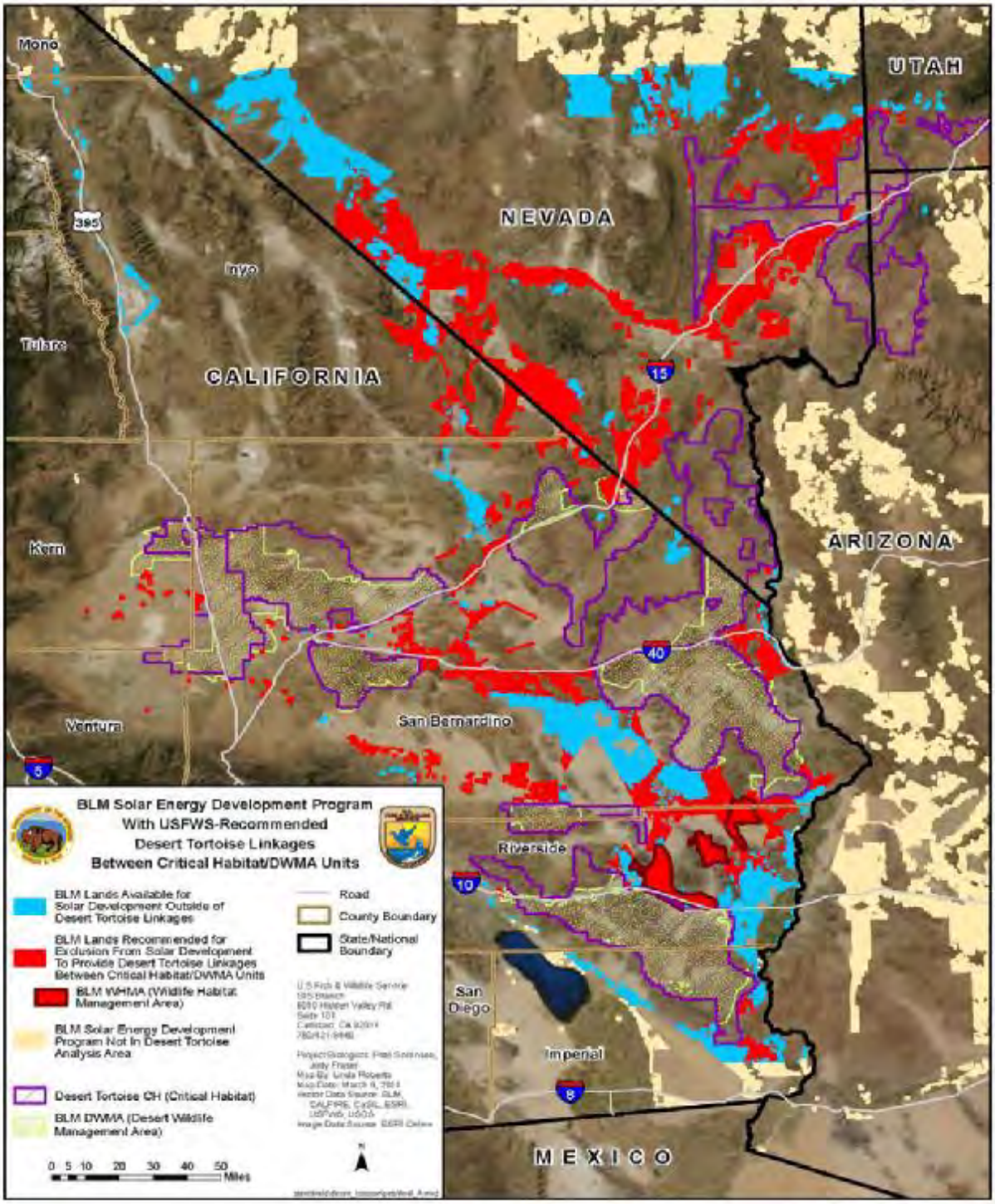
Appendix 2

Figure 1. This figure (FWS Attachment B-2) depicts the FWS proposal for the minimum linkage design (red) necessary for conservation and recovery of the Mojave population of the desert tortoise by connecting Desert Wildlife Management Areas (yellow mottled) and critical habitat units (purple hatched). It represents the intersection of lands proposed by the BLM as open for solar energy development under the preferred alternative (blue) with the linkage design (i.e., modeled predicted desert tortoise habitat, historic gene flow, and select Wildlife Habitat Management Areas) (red). The lands in red are proposed for exclusion from solar energy development by the FWS and are in addition to those the BLM has identified as excluded in the DPEIS.


Mono
UTAH
NEVADA
395
Inyo
Tulare
CALIFORNIA
15
Kern
ARIZONA
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Ventura
San Bernardino
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Riverside
10
San Diego
Imperial
8
MEXICO
BLM Solar Energy Development Program
With USFWS-Recommended
Desert Tortoise Linkages
Between Critical Habitat/DWMA Units
BLM Lands Available for Solar Development Outside of Desert Tortoise Linkages
BLM Lands Recommended for Exclusion From Solar Development To Provide Desert Tortoise Linkages Between Critical Habitat/DWMA Units
BLM WHMA (Wildlife Habitat Management Area)
BLM Solar Energy Development Program Not In Desert Tortoise Analysis Area
Desert Tortoise CH (Critical Habitat)
BLM DWMA (Desert Wildlife Management Area)
Road
County Boundary
State/National Boundary
0 5 10 20 30 40 50
Miles

Thank you for your comment, Adrian Field.

The comment tracking number that has been assigned to your comment is SEDDsupp20158.

Comment Date: January 27, 2012 18:46:16PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20158

First Name: Adrian
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Attachment: Solar Energy PEIS Letter.docx

Comment Submitted:

Comments attached as MS Word Doc.
Thanks you

Solar Energy PEIS Scoping Argonne National Laboratory 9700 S. Cass Ave. – EVS/900 Argonne IL 60439

Re: Scoping Comments on the Solar Energy Development Programmatic Environmental Impact Statement

To Whom It May Concern:

I appreciate the opportunity to comment on the Solar Energy Development Programmatic Environmental Impact Statement (PEIS). My sentiments and comments follow:

1. The PEIS must thoroughly analyze potential economic, material, and nonmaterial impacts to desert communities if the greater desert areas are industrialized with solar energy and transmission projects. Many desert communities depend economically on location- and resource-reliant industries such as tourism; location shooting for film, television, and advertising; recreation, both motorized and nonmotorized; and other cultural activities such as art, historical, and spiritual tours and retreats. Loss of greater-desert viewshed and open space means loss of livelihood for desert communities. Desert communities also increasingly rely on the aesthetic and environmental quality of their setting to attract today's increasingly mobile workforce that has become less geographically tethered and can choose where they live. Retirees are also a significant part of our communities that can choose where they live based on natural amenities and appeal. Therefore, our property values depend on those amenities and that appeal. A diminishment in the quality of desert life will mean income directly lost and future potential thrown away for

our communities. Desert towns will lose their meaning, their heart, and their health if the

surrounding desert is essentially "taken away" by industrialization.

2. The PEIS should include a thorough survey of impacts to

potentially culturally and historically significant lands, including areas developed as part of the historic 1938 Small-Tract Homestead Act that shaped many of the outlying, low-density communities in the Morongo Basin and elsewhere in the Southwest deserts. These unique communities in some cases lie largely intact, but their cultural and historical significance is only recently becoming recognized. Refer for example to the 2008 Wonder Valley Homestead Cabin Festival, which generated interest and participation from its cousin homestead-based communities such as Landers and Johnson Valley (http://homesteadcabin.wordpress.com/) and was featured in the 2008 Architectural Annual issue of Dune Magazine.

3. The PEIS should include consultation with Native American tribal governments to determine whether there are sites or specific areas of particular concern, including sites of traditional religious and cultural significance.

4. The PEIS should study the impacts of increased vehicular traffic and congestion on desert communities, environmental resources, road infrastructure, and public safety during both construction and operational phases of solar and transmission development.

5. The PEIS should study the impacts of worker populations on sensitive desert resources during both construction and operational phases of solar and transmission development.

6. The PEIS should study the impacts on resources that would follow from the introduction of new routes, in view of the known problems caused by off-road vehicle activity and the "invitation" effect of new routes.

7. The PEIS should study impacts on limited water resources

and the effects of competition with desert communities, as well as biological communities, for those resources.

8. The PEIS needs to include the proposed expansion of the Marine Corps Air-Ground Combat Center when considering cumulative and long-term impacts.

9. The PEIS needs to consider how the desert communities' own energy needs will or will not be served by these projects.

10. The PEIS must thoroughly analyze the socioeconomic, security, and environmental effects of remote installations versus locally distributed power and consider alternatives that focus renewable energy development close to the load centers. The impacts and benefits of a comprehensive program involving rooftop solar across the developed Southwest, as well as additional potential energy alternatives, must also be thoroughly analyzed and considered. To single out the desert to bear the brunt of providing energy for the urban areas is an ENVIRONMENTAL JUSTICE issue. To demand sacrifice only of the desert areas and not the load areas is not acceptable!

11. Areas that have already been degraded should be prioritized for consideration for solar and transmission development. No public lands that are basically still relatively undisturbed should be considered for solar energy or transmission use until all degraded lands have been utilized.

12. Removed from any consideration for solar and transmission development should be all protected lands, such as national and state parks, monuments, and preserves; environmentally significant areas such as Designated Wildlife Management Areas and Areas of Critical Environmental Concern; and lands with significant environmental

resource potential such as Wilderness Study Areas, other lands with wilderness

characteristics, and areas that are under consideration as potential wildlife corridors.

13. The PEIS must include a programmatic evaluation of cumulative impacts to Endangered and Listed species, especially the Desert Tortoise.

14. The PEIS must study the potential of construction and operational phases to introduce or encourage invasive vegetation, including *Brassica tournefortii* or Saharan Mustard, not just at project locations but throughout the desert areas, as vehicles are one of the biggest culprits for spreading invasives.

Thank you for your attention to these comments,

Sincerely,

Adrian Field

Thank you for your comment, Robyn Purchia.

The comment tracking number that has been assigned to your comment is SEDDsupp20159.

Comment Date: January 27, 2012 18:48:52PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20159

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Attachment: 2187-009 - Comments by CURE on Solar SDPEIS.pdf

Comment Submitted:

Attached please find comments from Adams Broadwell Joseph & Cardozo submitted on behalf of California Unions for Reliable Energy.

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January 27, 2012

SUBMITTED ELECTRONICALLY *via*
http://solareis.anl.gov/involve/comments/index.cfm

Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue
EVS/240
Argonne, IL 60439

Re: Comments on Supplemental Draft Programmatic Environmental Impact Statement for Solar Development in Six Southwestern States

To Whom It May Concern:

We are writing on behalf of California Unions for Reliable Energy ("CURE") to provide the Bureau of Land Management ("BLM") with comments on the BLM's proposed Solar Energy Program ("Program") to support utility-scale solar development on BLM administered land. We appreciate the work that BLM has invested in this process, and we enthusiastically support the efforts of the Obama administration to develop renewable energy. These efforts have helped dramatically expand renewable energy while creating thousands of good jobs. We want to see the Obama administration continuing to expand renewable energy and create jobs in a way that is environmentally sustainable over the long term.

Through the Program, the BLM proposes to identify and prioritize development in solar energy zones ("SEZ"). There are two SEZs proposed in California: Imperial East and Riverside East. We have reviewed the Supplement to the Draft Programmatic Environmental Impact Statement ("Supplemental PEIS") prepared pursuant to the National Environmental Policy Act ("NEPA") for the Program and submit the following comments for your consideration.

I. FUTURE ENVIRONMENTAL REVIEW

The Supplemental PEIS states that the BLM is conducting "a thorough environmental review of the proposed SEZs so that future reviews of applications within SEZs can tier to that NEPA analysis, thereby limiting the required scope and effort of additional project-specific NEPA analyses."[1] However, the Supplemental PEIS also states that the Draft Solar PEIS only relies on data that was available to analyze the Program's impacts.[2] To more effectively facilitate future development in SEZs, the BLM has committed itself to collecting additional information to fill in the recognizable "data gaps" in its analysis.[3] We are concerned that the Supplemental PEIS is unclear regarding when the data will be provided and when the public will be provided an opportunity to review and comment on the data and the BLM's analysis of such data. Therefore, the Supplemental PEIS must require these data gaps to be filled in all future, project-specific NEPA analyses that are circulated to the public for review.

Section 101 of NEPA declares it a matter of national policy to preserve important historic, cultural and natural aspects of our national heritage. To achieve this goal, NEPA requires that agencies take a "hard look" at the environmental consequences of a proposed action.[4] "General statements about 'possible' effects and 'some risk' do not constitute a 'hard look' absent a justification regarding why more definitive information could not be provided."[5] ***"[L]ack of knowledge does not excuse the preparation of an EIS; rather it requires the [agency] to do the necessary work to obtain it."***[6]

To comply with NEPA and effectuate its purpose of preserving the important historic, cultural and natural aspects of our heritage, the BLM must require future developers to provide all data identified in the "action plans" and make that data available for public review in future site-specific NEPA documents. This definitive

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[1] Supplement PEIS, p. 2-20.
[2] *Id.* at p. 2-18.
[3] *Ibid.*
[4] Robertson v. Methow Valley Citizens Council, 490 U.S. 332, 350 (1989); *Dubois*, 102 F.3d at 1284 (1st Cir. 1996); *see also* S. Fork Band Council of W. Shoshone of Nev. v. U.S. Dep't of the Interior, 588 F.3d 718, 727 (9th Cir. 2009).
[5] Neighbors of Cuddy Mountain v. U.S. Forest Serv., 137 F.3d 1372, 1380 (9th Cir. 1998).
[6] Nat'l Parks & Conservation Ass'n v. Babbitt, 241 F.3d 722, 733 (9th Cir. 2001), *abrogated on other grounds*, Monsanto Co. v. Geertson Seed Farms, 130 S.Ct. 2743 (2010) (emphasis added).

information is necessary for the BLM to take a "hard look" at project-specific impacts within the proposed SEZs and for the public to have an opportunity to review and comment on BLM's analysis. Specifically, additional data is necessary for the BLM to take a hard look at a specific project's impacts on -- at a minimum -- water resources, cultural resources, biological resources, transmission capacity and public health.

A. Additional project-specific and site-specific data is necessary for the BLM to take a "hard look" at any future project's impacts on water resources

The Supplemental PEIS states that use of groundwater for projects proposed within the Imperial East and Riverside East SEZs would deplete the aquifer.[7] Nevertheless, as the Draft PEIS recognizes, water is necessary for the construction, operation and decommissioning of every type of solar technology.[8] Because the use of groundwater within the California SEZs would deplete the aquifer, developers would need to acquire water from other sources or do a more specific assessment before using groundwater resources. The BLM recognizes a data gap in its water resources analysis in the Supplemental PEIS.[9] Therefore, at this time, the BLM has failed to take a "hard look" at project-specific impacts to water resources.

In the Supplemental PEIS, the BLM must require all future project applicants to provide site-specific and project-specific data on a project's proposed use of water resources. This information must be required at the time a project is proposed in order to enable the BLM to conduct a site-specific analysis of impacts on water resources. The BLM must then release its draft analysis of such data in an environmental review document that is circulated to the public for review.

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[7] Supplemental PEIS, pp. C-39, C-55.
[8] Draft PEIS, pp. 5-38 to 5-39, 5-43, 5-45 to 5-47.
[9] See Supplemental PEIS, p. C-339.

B. Additional project-specific and site-specific data is necessary for the BLM to take a hard look at any future project's impacts on cultural and paleontological resources

The Supplemental PEIS states that potential impacts on significant paleontological and cultural resources are unknown for both SEZs.[10] The Imperial East SEZ is in the midst of a sacred landscape traversed by a network of trails.[11] Indeed, the Quechan Tribe recommended elimination of the Imperial East SEZ altogether because of cultural resources concerns.[12] The Soboba Band of Luiseno Indians and the Quechan also expressed concern over highly sensitive areas within their Tribal Traditional Use Areas in the Riverside East SEZ.[13] The Supplemental PEIS, therefore, recommends additional data collection to reduce the uncertainty about the potential impacts on cultural resources.[14] Therefore, at this time, the BLM has failed to take a "hard look" at project-specific impacts on cultural and paleontological resources.

In the Supplemental PEIS, the BLM must require all future project applicants to provide site-specific and project-specific data on a project's impacts on cultural and paleontological resources. This information must be required at the time a project is proposed in order to enable the BLM to conduct a site-specific analysis of those impacts. The BLM must then release its draft analysis of such data in an environmental review document that is circulated to the public for review.

C. Additional project-specific and site-specific data is necessary for the BLM to take a hard look at any future project's impacts on biological resources

The Supplemental PEIS recognizes that development within both SEZs could adversely affect sensitive habitats both directly and indirectly through project development, habitat degradation and deposition of fugitive dust.[15] The Imperial

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[10] Supplemental PEIS, pp. C-39, C-56.
[11] *Id.* at pp. C-51.
[12] *Id.* at p. C-40.
[13] *Id.* at p. C-56.
[14] *Id.* at p. C-51, C-77 to C-78.
[15] *Id.* at pp. C-39, C-55.

East SEZ represents suitable habitat for 35 special-status species.[16] The Riverside East SEZ represents suitable habitat for 69 special-status species.[17] The Draft Solar PEIS presented a table of special-status species for which potential impacts must be evaluated prior to development in the proposed SEZs.[18] Because project development within the SEZs has the potential to impact biological resources significantly, the BLM must require project-specific information on species occurrences and use of specific project sites before approving ROW applications. Therefore, at this time, the BLM has failed to take a "hard look" at project-specific impacts on biological resources.

In the Supplemental PEIS, the BLM must require all future project applicants to provide site-specific and project-specific data on a project's impacts on biological resources. This information must be required at the time a project is proposed in order to enable the BLM to conduct a site-specific analysis of those impacts. The BLM must then release its draft analysis of such data in an environmental review document that is circulated to the public for review.

D. Additional project-specific and site-specific data is necessary for the BLM to take a hard look at any future project's impacts from transmission

David Marcus, a former advisor to the California Energy Commission and expert in electricity and energy issues, reviewed the proposed methodology for the transmission analysis. His comments and curriculum vitae are attached as Attachment A. According to Mr. Marcus, the BLM's proposed methodology in the Supplemental PEIS contains numerous errors and does not inform an analysis of transmission access issues and potential capacity.[19] In his opinion, the methodology needs to take into account networked power flows and the existing set of projects that are already queued up for interconnection.[20]

To take a hard look at the transmission needs of proposed projects, the BLM must collect additional data on existing projects and transmission capacity. This

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[16] *Id.* at p. C-39.
[17] *Id.* at p. C-55.
[18] *Id.* at p. C-45; Draft PEIS, Table 9.1.12.1-1.
[19] Letter from David Marcus, to Robyn C. Purchia, Attorney, Adams Broadwell Joseph & Cardozo (Jan. 26, 2012), pp. 1-3 (Attachment A).
[20] *Id.* at p. 3.

information must be collected on an ongoing basis as projects are proposed and added to the transmission grid. The BLM also must ensure that project-specific NEPA documents collect additional transmission data and take the requisite hard look at potential transmission impacts. Therefore, at this time, the BLM has failed to take a "hard look" at project-specific impacts related to transmission.

In the Supplemental PEIS, the BLM must require all future project applicants to provide project-specific and "real-time" data regarding transmission. This information must be required at the time a project is proposed in order to enable the BLM to conduct a site-specific analysis of potential impacts. The BLM must then release its draft analysis of such data in an environmental review document that is circulated to the public for review.

E. Additional project-specific and site-specific data is necessary for the BLM to take a hard look at any future project's impacts on public health

The Supplemental PEIS did not acknowledge impacts to workers who may be exposed to contaminants in the soil during project construction, operation and decommissioning activities. Site-specific data regarding existing and potential contamination and other hazards is necessary to take a hard look at a project's impacts to public health. Therefore, at this time, the BLM has failed to take a "hard look" at project-specific impacts on public health.

In the Supplemental PEIS, the BLM must require all future project applicants to provide site-specific and project-specific data on a project's impacts on public health from hazards existing and proposed on future project sites. This information must be required at the time a project is proposed in order to enable the BLM to conduct a site-specific analysis of public health impacts. The BLM must then release its draft analysis of such data in an environmental review document that is circulated to the public for review.

II. BLM MUST PREPARE A SUPPLEMENTAL EIS INSTEAD OF A FINAL EIS IF IT MAKES SUBSTANTIAL CHANGES TO THE PROPOSED ACTION

"An agency's NEPA responsibilities do not end with the initial assessment; supplemental documentation 'is at times necessary to satisfy the Act's action-forcing purposes.'"[21] As stated by the United States Supreme Court in *Marsh v. Oregon Natural Resources Defense Council*,

> It would be incongruous . . . with the Act's manifest concern with preventing uninformed action, for the blinders to adverse environmental effects, once unequivocally removed, to be restored prior to the completion of agency action simply because the relevant proposal has received initial approval.[22]

In addition to NEPA's requirement that BLM prepare site-specific project analyses, as described above, NEPA also requires the BLM to prepare a supplemental EIS in certain circumstances. A supplemental EIS ***must*** be prepared if the agency makes "substantial changes in the proposed action that are relevant to environmental concerns" or if "there are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts."[23] "This is a low standard."[24] If there is any "substantial question regarding whether a project may have a significant effect," then the BLM must conduct supplemental environmental review.[25] If a proposed project affects environmental concerns in a manner differently than previously analyzed, the change is surely "relevant" to those same concerns.[26]

Here, the BLM states that additional data on mineral resources, visual resources, cultural resources, and transmission will be provided for inclusion in the

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[21] Price Roads Neighborhood Ass'n, Inc. v. U.S. Dept. of Transp., 113 F.3d 1505, 1509.
[22] Marsh v. Oregon Natural Res. Def. Council, 490 U.S. 360, 371 (1989).
[23] 40 C.F.R. § 1502.9(c)(1).
[24] Klamath Siskiyou Wildlands Ctr. v. Boody, 468 F.3d 549, 569 (9th Cir. 2006).
[25] *Id.*; *see also Price Roads Neighborhood Ass'n*, 113 F.3d at 1509 ("supplemental documentation is only required when the environmental impacts reach a certain threshold-i.e. significant (defined at 40 C.F.R. § 1508.27) or uncertain").
[26] New Mexico ex rel. Richardson v. Bureau of Land Mgmt., 565 F.3d 683, 707 (10th Cir. 2009).

Final PEIS.[27] If the collection of this additional data causes the BLM to make substantial changes to the proposed action or constitutes significant new information relevant to environmental concerns, the BLM must publish a Supplemental PEIS instead of a Final PEIS and circulate the Supplemental PEIS to the public for review.

III. CONCLUSION

In the Supplemental PEIS, the BLM fails to take a "hard look" at project-specific impacts on water resources, cultural resources, biological resources, public health and from transmission. Therefore, the BLM must make clear that all future project applicants must provide site-specific and project-specific data on these resource areas. This information must be required at the time a project is proposed in order to enable the BLM to conduct site-specific analyses of each future project. The BLM must then release its draft analyses in environmental review documents that are circulated to the public for review. Finally, if new information is added to the Supplemental PEIS after the pending comment period, the BLM must publish a Supplemental PEIS instead of a Final PEIS and circulate the Supplemental PEIS to the public for review.

By faithfully complying with the requirements of NEPA, BLM will help ensure that development of renewable energy on BLM land will be sustainable, and the renewable energy potential of the area will be fully realized.

Sincerely,

Robyn C. Purchia/ljl

Robyn C. Purchia

RCP:ljl

Attachment

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[27] Supplemental PEIS, pp. C-61,C-71, C-77, Appendix C.

ATTACHMENT A

Comments of David Marcus on the “SLT” transmission analysis in the Solar Program Supplemental PEIS

The PEIS says that load flow data is used to "establish normal flow patterns on existing high-voltage lines surrounding the SEZ." (p. C-337.) Normal flow patterns are utterly irrelevant to whether new generation can be interconnected. New interconnections are allowed only if they will not cause overloads under all expected conditions, which includes peak load conditions and N-1 conditions. For the California ISO, interconnection analyses also include N-1/G-1 conditions in which both one major generator and one major facility (transmission line or transformer) are assumed both out at once, while loads are also at peak levels. For other states, N-1 conditions during peak loads may be sufficient. But no utility or system operator assumes that spare capacity can be determined based on "normal" conditions when loads are not at absolute peak levels and all facilities are in service.

Using inadequate methodology, the PEIS concludes that there will be a minimum of 2532 Mw of spare capacity on the Colorado River-Devers-Valley-Serrano transmission path in 2020. (p. C-338). The more detailed analysis shows that the "normal flow" data was actually calculated by PEIS consultants from FERC data and is in no way measured data. The more detailed analysis concludes that "normal flow" on the Palo Verde-Devers-Valley path is only 963 Mw. (Figure 4, p. 22; note that this same figure contains a wildly inaccurate map of 500 kV transmission lines in Southern California, showing non-existent lines between Imperial and Riverside Counties, between San Diego and Orange Counties, between San Diego and Riverside Counties, between Riverside and San Bernardino Counties (Devers-Lugo), and within Imperial, San Diego, Orange, and Los Angeles Counties.) It concludes that there was 1637 Mw of spare capacity on the Palo Verde-Devers line in 2011 and even more spare capacity farther west. (Figure 5, p. 23; this figure has the same wildly inaccurate map of 500 kV transmission as Figure 4.)

The absurdity of the PEIS analysis can be seen in the fact that while the PEIS was concluding that there are thousands of Mw of space on lines from Arizona to California (5738 Mw in 2015 on the Colorado-Devers line, per p. C-338), the CAISO was concluding new potential developments would require new transmission lines west of Devers that would take 7 years to complete. (See attached public document, a redacted copy of the Blythe Solar interconnection study by the CAISO, pp. 11-13 and also 16-17.)

The PEIS supplemental study admits that it doesn't use the “new” standard power flow techniques that real transmission planners have used for decades. (p. 4.) It also admits that it doesn't consider the impact of other queued generators located outside of the particular SEZ. (p. 24.) Finally it admits that it doesn't consider the impact of "multiple line pathway capabilities", which appears to be its contorted way of saying that it ignores the fact that the electrical grid is, in fact, a network. (p. 24, fn. 6.) But the networked nature of the grid is its primary characteristic. To evaluate grid capabilities without taking into account that it is a grid is like saying that because two small towns are connected by a freeway it must be easy to travel between them, while ignoring the large city that uses the same freeway and has rush hours.

The PEIS supplemental study admits that it "does not address all the complexities", but the reality is that it is so far from addressing the reality of the grid that what it does address is meaningless. (p. 24, fn. 6.) The California ISO, facing the real world problem of interconnecting new solar generators to the grid (the 1/12/2012 ISO interconnection queue contains over 39,000 Mw of solar projects), has struggled for years with the issue of how to model transmission availability.

The sad truth is that to have any hope of providing a realistic estimate of existing system capacity, the SLT methodology would need to be completely scrapped and replaced with a methodology that takes into account networked power flows and takes into account the existing set of projects that are already queued up for interconnection. The approximations used to provide the SLT estimates of spare capacity are simply wrong.

RESUME

DAVID I. MARCUS
P.O. Box 1287
Berkeley, CA 94701-1287

June 2011

Employment

Self-employed, March 1981 - Present

Consultant on energy and electricity issues. Clients have included Imperial Irrigation District, the cities of Albuquerque and Boulder, the Rural Electrification Administration (REA), BPA, EPA, the Attorney Generals of California and New Mexico, alternative energy and cogeneration developers, environmental groups, labor unions, other energy consultants, and the Navajo Nation. Projects have included economic analyses of utility resource options and power contracts, utility restructuring, utility bankruptcy, nuclear power plants, non-utility cogeneration plants, and offshore oil and hydroelectric projects. Experienced user of production cost models to evaluate utility economics. Very familiar with western U.S. grid (WSCC) electric resources and transmission systems and their operation and economics. Have also performed EIS reviews, need analyses of proposed coal, gas and hydro powerplants, transmission lines, and coal mines. Have presented expert testimony before FERC, the California Energy Commission, the Public Utility Commissions of California, New Mexico, and Colorado, the Interstate Commerce Commission, and the U.S. Congress.

Environmental Defense Fund (EDF), October 1983 - April 1985

Economic analyst, employed half time at EDF's Berkeley, CA office. Analyzed nuclear power plant economics and coal plant sulfur emissions in New York state, using ELFIN model. Wrote critique of Federal coal leasing proposals for New Mexico and analysis of southwest U.S. markets for proposed New Mexico coal-fired power plants.

California Energy Commission (CEC), January 1980 - February 1981

Advisor to Commissioner. Wrote "California Electricity Needs," Chapter 1 of Electricity Tomorrow, part of the CEC's 1980 Biennial Report. Testified before California PUC and coauthored CEC staff brief on alternatives to the proposed 2500 megawatt Allen-Warner Valley coal project.

CEC, October 1977 - December 1979

Worked for CEC's Policy and Program Evaluation Office. Analyzed supply-side alternatives to the proposed Sundesert nuclear power plant and the proposed Point Concepcion LNG terminal. Was the CEC's technical expert in PG&E et. al. vs. CEC lawsuit, in which the U.S. Supreme Court ultimately upheld the CEC's authority to regulate nuclear powerplant siting.

Energy and Resources Group, U.C. Berkeley, Summer 1976

Developed a computer program to estimate the number of fatalities in the first month after a major meltdown accident at a nuclear power plant.

Federal Energy Agency (FEA), April- May 1976

Consultant on North Slope Crude. Where To? How?, a study by FEA's San Francisco office on the disposition of Alaskan oil.

Angeles Chapter, Sierra Club, September 1974 - August 1975

Reviewed EIRs and EISs. Chaired EIR Subcommittee of the Conservation Committee of the Angeles Chapter, January - August 1975.

Bechtel Power Corporation (BPC), June 1973 - April 1974

Planning and Scheduling Engineer at BPC's Norwalk, California office. Worked on construction planning for the Vogtle nuclear power plant (in Georgia).

Education

Energy and Resources Group, U.C. Berkeley, 1975 - 1977

M.A. in Energy and Resources. Two year master's degree program, with course work ranging from economics to engineering, law to public policy. Master's thesis on the causes of the 1972-77 boom in the price of yellowcake (uranium ore). Fully supported by scholarship from National Science Foundation.

University of California, San Diego, 1969 - 1973

B.A. in Mathematics. Graduated with honors. Junior year abroad at Trinity College, Dublin, Ireland.

Professional Publications

"Rate Making for Sales of Power to Public Utilities," with Michael D. Yokell, in Public Utilities Fortnightly, August 2, 1984.

Thank you for your comment, Mike Lipsitz.

The comment tracking number that has been assigned to your comment is SEDDsupp20136.

Comment Date: January 27, 2012 15:53:32PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20136

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Comment Submitted:

The Solar PEIS Supplement with its extensive scientific data and regulatory information requires additional time for stakeholders to make informed comments.
A 3 month extension of the public comment period is necessary to have sufficient time to adequately analyze the effects of 20 million additional acres of public lands and to ensure a meaningful democratic process.

I hope you will give strong consideration to this extension request.

Thank you for your comment, Douglas Clark.

The comment tracking number that has been assigned to your comment is SEDDsupp20137.

Comment Date: January 27, 2012 15:54:52PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20137

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Attachment:

Comment Submitted:

1. If the Solar arrays are placed on the proposed public lands, make sure the leases are profitable for the American Citizens (i.e. high lease costs).
2. Place Solar Arrays where there are small isolated BLM properties surrounded by private land. This could be a win win situation for the Federal Goverment and Private Land Owners - this is called Collabortion.
3. There are lots of private farms that have limited water use and would be good candidates for such Solar Array proposals.
4. Place Solar Arrays on allready distrubed ground (i.e. irragated farmland, cities, along highways.)
5. Keep the scale of solar arrays small so that more people can benifit (i.e. no greater than 50 MW solar array).
6. The proposed solar sites will impact the visual quality and wide open feeling enjoyed by thousands of people.

Thank you for your comment, Alex Daue.

The comment tracking number that has been assigned to your comment is SEDDsupp20138.

Comment Date: January 27, 2012 16:17:30PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20138

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Attachment: Supplement to Solar DPEIS Comments - Nevada (TWS and partners 1-27-12).pdf

Comment Submitted:

TWS et. al Nevada comments.

January 27, 2012

Delivered via electronic submission to the BLM Solar PEIS website and U.S. mail (with attachments).

Shannon Stewart, BLM Solar PEIS Project Lead
Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue
EVS/240
Argonne, IL 60439

Re: Comments on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (Nevada portion)

Dear Ms. Stewart:

Please accept and fully consider these comments on the Nevada portion of the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (Supplement) on behalf of The Wilderness Society, Nevada Wilderness Project, Defenders of Wildlife and Sierra Club. Please note that these comments are specific to the Nevada portion of the Supplement – some of the signatory groups are also submitting separate comment letters addressing the other states included in the PEIS as well as overarching policy issues. Our April 18, 2011 comments on the Draft PEIS are incorporated by reference.

Overview

We appreciate the overall direction of the Supplement with its additional focus on guiding solar projects to low-conflict Solar Energy Zones (SEZs) in the Modified Solar Energy Development Alternative. The Department of Interior (DOI) and the Bureau of Land Management (BLM) have shown a strong commitment to zone-based development in both the Supplement and in public statements since the publication of the Supplement. We believe that this focus is critical for both the protection of wildlands and wildlife habitat and for meeting our climate and clean energy goals through the success of responsible solar development on public lands. **The BLM should continue to refine the Programmatic Environmental Impact Statement (PEIS) through the Final PEIS and Record of Decision (ROD), carrying forward the zone-based focus and most other elements of the Supplement, and sign the ROD by fall 2012.**

We also appreciate that the BLM has addressed many of the specific recommendations we made on the Draft PEIS regarding the Nevada SEZs in the SEZ action plans in the Supplement. Completing the proposed additional analyses, pre-construction surveys, mapping and other reviews identified in the SEZ action plans will be very important for the success of low-impact solar development in the SEZs, and the BLM should ensure that these efforts are completed prior to development.

Our comment letter addresses several issues, including the following key issues:

- **Exclusion areas:** The Supplement should be strengthened by adding Citizen Inventoried Wilderness lands, BLM-identified lands with wilderness characteristics that are not managed to protect those characteristics, desert tortoise connectivity corridors and the other key areas listed below to the exclusion list.
- **Variance process and desert tortoise:** The BLM should ensure protection of desert tortoise by employing special variance application requirements and strengthening those requirements beyond Option 2 set out in the Supplement, as detailed in this letter.
- **Changes to SEZs and proposed SEZ action plans:** We support most of the changes to the SEZs and the SEZ action plans included in the Supplement. Key recommendations from our comments on the Draft PEIS that still need to be addressed are highlighted in this letter.
- **Visual Resource Management in SEZs:** Given the rapidly evolving nature of solar technologies, the BLM should address visual resource impacts on a project-by-project basis in the SEZs, rather than using the proscriptive height and technology restrictions proposed in the Supplement.

I. The BLM should strengthen the exclusion areas in the Final PEIS.

We appreciate the set of exclusion areas included in the Draft PEIS and the Supplement to limit impacts to sensitive natural and cultural resources. The additional exclusion areas added in the Supplement will also help limit impacts and facilitate responsible solar development. **We advise the BLM to coordinate with appropriate staff at the state office of the Nevada Department of Wildlife to make certain that the best available wildlife data are fully incorporated into the analysis of areas potentially open to variance applications prior to publication of the Final PEIS. In addition, BLM should also exclude the following areas from development:**[1]

- BLM-identified lands with wilderness characteristics not managed to protect those characteristics;
- 165,000 acres of Citizens' Proposed Wilderness lands;[2]
- 6,211 acres of 75% core sage-grouse habitat (75% core should be the minimum standard for sage-grouse habitat). We also note that a more comprehensive and scientifically derived analysis is nearing completion and should be used to update the variance application areas prior to publication of the Final PEIS in lieu of the core maps;
- Over 400,000 acres of occupied bighorn sheep habitat or crucial winter habitat for mule deer and pronghorn: the Supplement includes "Big Game Winter Ranges identified in applicable land use plans" amongst the exclusion areas, and these additional 400,000 acres should also be excluded (Supplement at p. 2-16);

[1] Detailed rationales for excluding these areas from solar development were included in our April 18, 2011 comment letter on the Draft PEIS, and are incorporated here by reference.
[2] GIS data for these areas are included as Attachment 1.

- Over 1.1 million acres of identified wildlife movement habitats, or corridors, for big game mammals: the Supplement includes "Big Game Migratory Corridors identified in applicable land use plans" amongst the exclusion areas, and these additional 1.1 million acres should also be excluded (Supplement at p. 2-16);
- 83 different Nevada Heritage species within variance lands;
- 1 Candidate, 4 Threatened, and 5 Endangered Species impacted by variance lands according to the NDOW diversity dataset;
- Desert tortoise connectivity areas: as detailed beginning on page four of these comments, the BLM should exclude desert tortoise connectivity areas from solar development. The BLM should also continue to incorporate additional information regarding protection of this species as it becomes available, and adjust management based on the best available science;[3]
- The Seven Significant Spring Landscapes identified in the Nevada Springs Conservation Plan prepared by the Nature Conservancy, the Desert Research Institute and the Nevada Natural Heritage Program[4] including: Amargosa Desert, Railroad Valley, White River Valley, Pahranagat Valley, Upper Muddy River,
- Steptoe Valley and Soldier Meadow;
- Ivanpah Valley public lands:[5] The Ivanpah Valley is a unique valley spanning the state line between California and Nevada. Because of this biologically arbitrary boundary, impacts to biological resources from renewable energy developments in different parts of the same valley are evaluated by different states. The Ivanpah Valley is important because it is home to a dense population of the federally threatened desert tortoise as well as rare plan communities. A small portion of the valley in California is designated as a desert tortoise Area of Critical Environmental Concern (ACEC) under the Northern and Eastern Mojave Plan. A portion of federally designated critical habitat is also identified in the southeastern part of the valley.

  Surveys on both sides of the state line indicate an extant, robust population of desert tortoise. In fact, the U.S. Fish and Wildlife Service's (FWS) October 10, 2010 Biological Opinion on the Ivanpah Solar Electric Generating Station (ISEGS), which is located in the southwestern part of the valley, states at p. 63: "We recommend that the Bureau amend the California Desert Conservation Area Plan to prohibit large-scale development (e.g., solar energy facilities, wind development, etc.) within the area bounded by Interstate 15, the State line, and Clark Mountains." This recommendation was limited to the land on the California side of the border, because the local office of the consulting agencies' jurisdiction was in California.

[3] Ecological genetics of the Mojave Desert tortoise, 2008, B. E. Hagerty. University of Nevada, Reno. Ecology, Evolution and Conservation Biology.
[4] http://heritage.nv.gov/reports/springcons.pdf
[5] Please note that the Silver State II project application is not a variance application and therefore our comments regarding the Ivanpah Valley as a recommended exclusion area would not apply to that specific project.

As the BLM is well aware, the ISEGS project quickly reached its "take" limit of desert tortoises and had to re-initiate consultation with the Service, which resulted in a new Biological Opinion on June 10, 2011. In the new Biological Opinion, the FWS expanded its recommendation to include the whole of the Ivanpah Valley, stating "We recommend that the Bureau amend the necessary land use plans to prohibit large-scale development (e.g., solar energy facilities, wind development, etc.) within all remaining portions of the Ivanpah Valley to reduce fragmentation within the critical linkage between the Ivanpah Critical Habitat Unit and the Eldorado Critical Habitat Unit." (at pg. 92-93). This new recommendation recognizes that the whole valley is important to the survival of this population of desert tortoise, and that the linkage between the Ivanpah Critical Habitat Unit, which is in California, and the Eldorado Critical Habitat Unit, which is in Nevada, must be kept intact. In line with the direction already identified by the FWS, BLM-administered lands within the Ivanpah Valley should be included as an exclusion area for variance applications.

Although BLM is undertaking a new cumulative effects analysis for a portion of the Ivanpah Valley (and which does not include much of the valley in Nevada), it has not finished the analysis. Nor has the BLM developed either a comprehensive bi-state assessment or a long-term management plan for this important valley. Meanwhile, the entire Ivanpah Valley has been nominated as an ACEC, in order to provide further safeguards for the desert tortoise in this important valley as well as a suite of very rare plants and significant cultural values present there. To avoid further degradation of the valley, we urge that it be excluded from variance applications.

II. The BLM should ensure that the variance process protects desert tortoise.

The desert tortoise is a bellwether species for the Mojave and Sonoran desert ecosystems. Listed as a federal threatened species by the FWS in 1990, desert tortoise numbers remain low in spite of ongoing recovery efforts, and this animal remains in an imperiled state. Since renewable energy development has the potential to significantly and irreversibly affect desert tortoise populations and the ability of this iconic species to recover, it is essential that the DOI adopt standards for solar energy development in the Final PEIS that will provide for the recovery of desert tortoise populations and the species as a whole. These standards should include: 1) the protection of key habitat for the desert tortoise, including occupied and unoccupied but suitable habitat, and 2) the protection of key connectivity habitats and linkages for the desert tortoise.

We recommend that the United States Geological Survey (USGS) desert tortoise habitat suitability model[6] and desert tortoise density be used to provide interim criteria for areas

[6] Nussear, K.E., T.C. Esque, R.D. Inman, L. Gass, K.A. Thomas, C.S.A. Wallace, J.B. Blainey, D.M. Miller, and R.H. Webb. 2009. Modeling habitat of the desert tortoise (*Gopherus agassizii*) in the Mojave and parts of the Sonoran Deserts of California, Nevada, Utah, and Arizona: U.S. Geological Survey Open-File Report 2009-1102, 18 p.

where variance applications will be accepted but also recognize that development of a more detailed model is needed to guide conservation of the species at the appropriate scale required for solar project siting. The USGS desert tortoise habitat suitability model was intended to provide guidance for conservation planning at the range-wide scale, and represents the most comprehensive effort to define suitable habitat for the species to date. The one kilometer cell size used for this analysis and the emphasis on topographical, soil, and meteorological data as predictors make the model useful for predicting at the landscape-scale, but they do not provide the needed precision for analyses at the sub-regional scale or at the solar project sitting level.

Until additional refinement of a habitat model is completed by FWS, the following criteria should be met:

For applications in variance application areas that are within the range of desert tortoise but outside of proposed connectivity areas, (as modified by our recommendations in these comments), the applicant must provide documentation of the following:

- Project area has less than or equal to 2 tortoises (>160 mm Midline Carapace Length) per square mile; and
- Where Habitat Potential Index Value is 0.7 or greater, verification that the habitat condition is "highly converted."[7] This verification should be provided through application of science-based models of land conditions through field inspection.

Our recommended criterion of two adult desert tortoises per square mile is based on current range-wide density estimates within recovery units that range from three to 36 per square mile.[8]

The predicted habitat suitability rating of 0.7 and above (on a scale of 0 to 1.0) is significant because 95% of the lands with a rating of greater than 0.7 in the USGS habitat suitability model also had confirmed presence of desert tortoises based on field survey data. This habitat model, based on 10 environmental factors that included soils, vegetation, precipitation, elevation, and topography, is a sufficiently robust, science-based model, for interim land use planning and conservation planning for the Desert tortoise and its habitat, but further refinements are needed to make habitat suitability predictions more accurate and precise, both to protect important habitat as well as to ensure that areas not important for the species are not mis-identified.

Pursuing a model at finer scales would require the use of variables that directly or indirectly assess the resources used by tortoises when selecting habitat, such as the presence of plants used for forage, vegetation diversity, density of annuals vs. perennials, and so on. In addition, habitat connectivity analyses must be integrated with habitat

[7] "Highly converted" refers to urban, suburban and agricultural lands that are heavily altered. While some can support conservation targets, their ecological context is highly compromised.

[8] U.S. Fish and Wildlife Service. 2010. DRAFT Range-wide Monitoring of the Mojave Population of the Desert Tortoise: 2010 Annual Report. Report by the Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service, Reno, Nevada. 49 pp.

suitability analyses in order to ensure that the focus is on preserving suitable and occupied habitat that is connected with other population areas as well as to ensure these connectivity areas themselves are preserved to provide meta-population persistence.

The USGS desert tortoise habitat suitability model does not account for urban development, habitat destruction/fragmentation, or natural disturbances that have lowered habitat quality in recent years. Thus, we recommend using The Nature Conservancy's (TNC's) Mojave Desert Ecoregional Assessment[9] and the Conservation Biology Institute's Framework for Effective Conservation Management of the Sonoran Desert in California[10] to exclude these lands as having little or no habitat or conservation value. We recognize that it may be necessary to verify the habitat condition through field inspection and to accurately assess the adult desert tortoise density. We also recognize that modeling of suitable desert tortoise habitat needs to be refined through further field study and analysis, and that updated models should be developed soon and applied to our recommended criteria in variance application areas as they become available.

Successful recovery of the desert tortoise requires that existing populations and their higher rated habitats are protected from deleterious human impacts. If recovery actions are successful to the point of promoting population increases, lands included in our recommended Modified Option 2 where solar energy development would be inappropriate could be the very areas into which newly recruited tortoises would need to move in response to climate change or simply expand their population in response to successful recovery efforts.

Preserving connectivity between desert tortoise conservation areas is vital to promoting gene flow and maintaining and enhancing desert tortoise populations. Connectivity can only be preserved by maintaining intact landscape-level habitat, so it is critical that connectivity areas be conserved and protected.

We therefore strongly recommend that connectivity areas be excluded from development. We also recommend that the BLM's proposed connectivity habitats shown on Figure 2.2-2 (SPEIS at p. 2-36) be replaced with the connectivity (or "linkage") habitats recommended by the FWS in its comments on the Draft PEIS. See comments of U.S. Fish and Wildlife Service, Draft PEIS, May 6, 2011, Figure B-2. It is important to understand that agency's recommendations identified lands to be included in a "…*minimum linkage design necessary for the conservation and recovery of the Mojave population of the desert tortoise*…" FWS DPEIS comments, Figure B-2. (emphasis added)

III. Changes to SEZs and SEZ action plans.

[9] Randall, J. M., S.S. Parker, J. Moore, B. Cohen, L. Crane, B. Christian, D. Cameron, J. MacKenzie, K. Klausmeyer and S. Morrison. 2010. Mojave Desert Ecoregional Assessment. Unpublished Report. The Nature Conservancy, San Francisco, California. 106 pages + appendices. Available at: http://conserveonline.org/workspaces/mojave/documents/mojave-desert-ecoregional-2010/@@view.html.

[10] Conservation Biology Institute. 2009. A Framework for Effective Conservation Management of the Sonoran Desert in California. Prepared for The Nature Conservancy. 78 pp. + appendices.

In addition to the specific recommendations relating to individual SEZs below, we recommend that the BLM include in the Final PEIS a chart for each of the SEZs that identifies not only the additional data that is needed but who is responsible for compiling the data and completing each item listed, as well as a timetable for completion of the individual tasks.[11]

General recommendation regarding golden eagle habitat: the BLM should identify areas around SEZs with dense Golden eagle territories with surveys following USFWS wind guidelines. Nest surveys should be done (helicopter and pedestrian) as well as observations at points on the ground for juvenile eagles and non-breeding adults. If areas have dense territories, the BLM should add additional protective design features for development in these areas to ensure impacts to this species are avoided, minimized and mitigated.

Amargosa Valley SEZ

We are generally supportive of the proposed action plan for the Amargosa Valley SEZ, including the boundary adjustments to make the Amargosa River channel and floodplain, dune/sand transport areas in the southwest part of the SEZ as well as the area on the eastern side of highway 95 non-development areas, the restriction to solar technologies with low water use, and the commitment to monitor direct and indirect impacts on Special Status Species. The proposed mapping and survey efforts will be particularly important for supporting responsible development within the SEZ. **Provided that BLM completes the proposed action plan prior to development and incorporates our recommendations below and on the Draft PEIS, we support designation of the proposed Amargosa Valley SEZ as a SEZ in the Final PEIS.**

- The BLM should create an adaptive monitoring and mitigation plan which addresses the over-allocation of groundwater resources in the Amargosa Valley through:
    - Water mitigation and monitoring measures such as installing groundwater monitoring wells both within the SEZ and within a larger area where the estimated cone of depression may affect resources, with the information from such monitoring used to curtail groundwater use; and
    - Measures to avoid impacts from groundwater depletion to Special Status Species and aquatic and riparian communities.

Dry Lake SEZ

We are generally supportive of the changes to and proposed action plan for the Dry Lake SEZ, including the boundary adjustment to make Dry Lake playa and the associated wetland and floodplain non-development areas, removal of northern areas that support sensitive lizard species and bighorn sheep movements from the SEZ, and restriction to solar technologies with low water use. In addition, the proposed mapping and survey

[11] Detailed rationales for all SEZ-related recommendations were included in our April 18, 2011 comment letter on the Draft PEIS, and are incorporated here by reference.

efforts will be particularly important for supporting responsible development within the SEZ. **Provided that BLM completes the proposed action plan prior to development and incorporates our recommendations on the Draft PEIS, we support designation of the proposed Dry Lake SEZ as a SEZ in the Final PEIS.**

Dry Lake Valley North SEZ

We are generally supportive of the changes to and proposed action plan for the Dry Lake Valley North SEZ, including the removal of the northern part of the SEZ that provides important wildlife habitat and designation of the playa in the southwest corner as a non-development area. The proposed mapping and survey efforts will be particularly important for supporting responsible development within the SEZ. **Provided that BLM completes the proposed action plan prior to development and incorporates our recommendations below and on the Draft PEIS, we support designation of the proposed Dry Lake Valley North SEZ as a SEZ in the Final PEIS.**

- Desert Valley kangaroo mouse: The biologically distinct Desert Valley kangaroo mouse occurs in the vicinity of the SEZ and appears to have suitable habitat in the core of the SEZ. We recommend that a thorough survey for this species be conducted in the lands that have suitable habitat characteristics to refine the developable portion of this SEZ so that direct impacts to the species are excluded.

Gold Point SEZ

We are generally supportive of the changes to and proposed action plan for the Gold Point SEZ, including the removal of the intermittent stream corridor that passes partially through the SEZ. The proposed mapping and survey efforts will be particularly important for supporting responsible development within the SEZ. **Provided that BLM completes the proposed action plan prior to development and incorporates our recommendations on the Draft PEIS, we support designation of the proposed Gold Point SEZ as a SEZ in the Final PEIS.**

Millers SEZ

We are generally supportive of the changes to and proposed action plan for Millers SEZ, including the removal of the intermittent stream corridor that passes partially through the SEZ. The proposed mapping and survey efforts will be particularly important for supporting responsible development within the SEZ. Key recommendations from our comments on the Draft PEIS that are not addressed in the Supplement are included below. **Provided that BLM completes the proposed action plan prior to development and incorporates our recommendations below and on the Draft PEIS, we support designation of the proposed Millers SEZ as a SEZ in the Final PEIS.**

- The action plan for the SEZ should include surveys for Tecopa bird's beak, an alkali flat obligate plant that could occur in the southern part of the SEZ or further south, and could be affected by development.

- The action plan for the SEZ should include surveys for Wong's pyrig, a springsnail that could occur south of the SEZ and be indirectly affected by groundwater modification.
- We highlight the importance of Miller's Rest Stop as a stopover point for migratory birds. The BLM should include in the action plan and final design features additional protections to limit impacts to avian resources for Millers SEZ and lands open to variance application near Miller's Rest Stop. Additional analysis completed through the SEZ action plan and resulting additional protective measures may determine that certain technologies are inappropriate for this area because of their particular impacts on avian resources.

IV. Visual resource management in the SEZs.

The Supplement includes restrictions on a number of the Nevada SEZs to protect visual resources or military training routes. We support the BLM addressing these impacts from solar development. However, given the rapidly evolving nature of solar technologies, the BLM should not put in place proscriptive height and technology restrictions for applications in the SEZs. Instead, visual resource impacts should be addressed on a project-by-project basis.

V. Cumulative impacts analysis.

The Supplement states that the cumulative impacts analyses included in the Draft PEIS are currently being updated based on changes in the Supplement, and that updated analyses will be included in the Final PEIS. In order to fully support designation of the SEZs in Nevada, the BLM should ensure completion of robust cumulative impacts analyses and include them in the Final PEIS.

VI. The BLM should closely coordinate the PEIS with other BLM planning efforts including the Las Vegas-Pahrump Resource Management Plan revision.

As noted in the Supplement, in addition to the PEIS, the BLM is also undertaking efforts to identify renewable energy priority areas such as new SEZs in other ongoing planning efforts, including the Las Vegas-Pahrump RMP revision currently underway. (Supplement at p. 2-32) The BLM should take advantage of these opportunities to use more localized planning efforts to identify low-conflict priority areas for solar development, and the agency should ensure that these efforts are closely coordinated with the PEIS.

VII. The BLM should provide a 60 day public comment period on the Final PEIS.

There will be a significant amount of new information in the Final PEIS, including updated SEZ-specific design features, SEZ action plans, cumulative impacts analysis and monitoring and adaptive management protocols. For this reason, the BLM should

provide a 60 day public comment period on the Final PEIS. While we continue to encourage the BLM to complete the PEIS in a thorough and timely manner, it is very important that the public be given the opportunity to provide meaningful input on this new information in order to satisfy the requirements of the National Environmental Policy Act. Further, this comment period should not substantially delay the timeline for completion of the PEIS, because BLM's regulations obligate the BLM to provide a 30-day protest period and a concurrent 60-day governor consistency review of land use plan amendments. 40 C.F.R. §§ 1610.5-2; 1610.5-3. The proposed 60-day public comment period will run during these same timeframes.

Conclusion

We thank DOI and the BLM for proposing an approach to solar energy development on public lands in Nevada that will focus appropriate large-scale solar energy development needed to help alleviate the effects of climate change in low-conflict zones. This approach will help ensure that the natural and cultural resources of Nevada are protected for future generations. We look forward to working with the BLM as the agency finalizes the PEIS over the coming months.

Thank you for your thorough consideration of these comments.

Sincerely,

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Attachments

- Attachment1 – GIS data for Citizens' Proposed Wilderness Areas

Thank you for your comment, Eric Shepard.

The comment tracking number that has been assigned to your comment is SEDDsupp20139.

Comment Date: January 27, 2012 16:28:09PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20139

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January 27, 2012

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Re: Comments of the Colorado River Indian Tribes on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwest States

Dear BLM Solar PEIS Project Manager:

The Colorado River Indian Tribes ("CRIT" or "Tribes"), submits the following comments on the Supplement to the Draft Programmatic Environmental Impact Statement ("PEIS") for Solar Energy Development in Six Southwest States ("Solar Energy Development Program"). After reviewing the Supplement, CRIT remains concerned that the PEIS lacks sufficient information about the cultural resources that could be impacted by the alternatives analyzed, and impermissibly defers necessary cultural resource studies and analysis until after project approval. Far from streamlining the permitting process, this cart-before-the-horse approach is sure to create more conflict and discord down the road, when project applications have already been submitted and money invested, and analysis reveals that the selected site within designated Solar Energy Zones ("SEZ") contains significant cultural resources.

As a result, CRIT urges the Bureau not to approve the Solar Energy Development Program and PEIS at this time. A related process is currently underway, by which the Bureau and various Indian tribes in the region, including CRIT, have begun working on a map of the California desert area that could be used to divert projects away from culturally sensitive lands. At the very least, the Bureau should await

the results of that process before designating any federal land in California as suitable for utility-scale solar development.

Finally, while CRIT is not prepared to endorse any of the alternatives analyzed in the PEIS at this time, CRIT joins in the remainder of the comments submitted by the Quechan Tribe. *See* January 27, 2012 letter from Frank R. Jozwiak to BLM Solar PEIS Project Manager re: Comments of the Quechan Indian Tribe.

I. The Solar Energy Development Program and PEIS Should Not Be Finalized Until "Off-Limit" Areas Are Designated under the Desert Renewable Energy Conservation Plan.

In Fall 2011, CRIT participated in two meetings, referred to as "Tribal-Federal Leadership Conference Renewable Energy and Desert Planning Meetings" or "Tribal-Federal Leadership Meetings," to discuss the Desert Renewable Energy Conservation Plan ("DRECP") currently under consideration by the Department of Interior. As we understand it, the area to be governed by the DRECP is also entirely within the area governed by the Solar Energy Development Program analyzed in the PEIS and Supplement. At these meetings, officials from the Department of Interior represented to CRIT and other attendees that the DRECP process would use Tribal input to identify areas in the California desert that are "off-limits" to solar development due to significant cultural resource concerns. *See* Statement of Bob Laidlaw, Senior Policy Analyst Office of the Secretary of the Interior, *Tribal–Federal Leadership Conference, Renewable Energy and Desert Planning Meeting, Plenary Session Notes*, pg. 6, ("This cooperative approach to regional planning can . . . provide a means for tribes to help identify areas for future development which avoid sensitive resources."); Supplement at C-77 (referencing a cultural sensitivity map to be developed as part of the DRECP). According to these officials, Tribal participation in this planning effort would help agencies direct project development to areas with minimum cultural and natural resource conflicts.

Interestingly, the PEIS process was neither incorporated by reference, nor even mentioned at these meetings. Moreover, the Supplement contains a very different explanation of the purpose of the DRECP, asserting that the DRECP process will be used to identify *new* SEZ—i.e., to expand areas open to solar development in California. Page 2-30 to 32. This is decidedly not the message conveyed to Tribes at the Tribal-Federal Leadership Meetings. *See* Statement of Tom Pogacnik, California Deputy State Director, Bureau of Land Management, *Tribal–Federal Leadership Conference, Renewable Energy and Desert Planning Meeting, Plenary Session Notes*, pg. 8, ("[t]he purpose of the DRECP [is] to provide for the renewable energy development in the California Desert in a manner which conserves wildlife habitat and tribal cultural sites."). Thus CRIT requests that the

Bureau clarify the relationship between the DRECP and the PEIS in its response to these comments.

Despite this conflicting information, it is clear that the DRECP process and the PEIS process overlap in California. Given the important resources involved, CRIT believes that the Bureau should not approve the Solar Energy Development Program and PEIS—at least those portions intended to govern development in California—until the portion of the DRECP related to cultural resources has been fully developed and, through that process, more information is provided to the Bureau about the cultural resources at stake. This information is critical for the Bureau to make good decisions about where to encourage utility-scale solar development and where to exclude it. There is no need to defer this analysis until after project approval as the PEIS purports to do. *See* Supplement at C-77 (outlining the numerous steps BLM will take *after* the document is finalized to "reduce the uncertainty about potential impacts on cultural resources" in the Riverside East SEZ). A primary purpose of the PEIS is to identify those areas where utility-scale solar projects can be developed without significant resource conflict. Thus, it is wholly improper to defer identification of sensitive cultural resource areas and sites until after the PEIS is approved and SEZs are selected.

Moreover, designating areas for solar energy development within CRIT's ancestral homelands now, while telling CRIT that the Bureau will consider its input on the very same issues later, severely undermines CRIT's enthusiasm for the DRECP process, and therefore the likelihood that it will be successful. Because CRIT is supportive of BLM's efforts to include Tribes in the DRECP process and to avoid impacts to cultural resources, it does not wish to see the process undermined in this way.

In sum, CRIT believes that the Bureau should defer approval of the Solar Development Energy Program and the PEIS—at least for those areas that will also be governed by the DRECP—until after the DRECP process identifies the "off-limit" areas. At that time, with substantially more information about the nature and likely location of sensitive cultural resources in the area, the Bureau will be better equipped to designate areas that are truly suitable for this type of intense, industrial development.

II. The BLM's Preferred Alternative Does Not Provide Adequate Protections for Cultural Resources or Time for Tribal Consultation.

To date, CRIT has been frustrated with the process used by the Bureau to process individual solar project applications on federal lands near its Reservation. In a rush to approve "green energy solutions" to global warming, the Bureau has fast-tracked projects, deferring cultural resource analysis, mitigation, and, in some cases, meaningful consultation until after project approval. The comment and

consultation periods imposed by the Bureau have not afforded CRIT sufficient time to obtain its own experts to review the technical material accompanying these projects, and the sheer number of projects processed by the Bureau has been overwhelming. The existing process has also been dramatically unsuccessful at avoiding locations with sensitive cultural resources, as demonstrated by the recent discoveries at the Genesis Solar Energy Project. *See* January 19, 2012 letter from Chairman Eldred Enas to John Kalish, Field Office Manager re: Comments on the Proposed (Draft) Geoarcheological Trenching and Controlled Grading Evaluation Plan, Genesis Solar Energy Project, Riverside County, California.

Thus, any new approach to reviewing these solar utility projects must take into consideration the limited resources of the affected tribes, the importance of the cultural resources jeopardized by ill-sited projects, and the time necessary to thoroughly review a project for potential impacts.

Unfortunately, the BLM's preferred alternative, the Modified Solar Energy Development Program Alternative ("Modified Alternative"), incorporates even more fast-paced permitting schedules. According to the Supplement, if an applicant seeks to locate utility-scale solar projects within the SEZs: "the BLM will adhere internally to strict schedules for the completion of environmental reviews for applications in SEZs, with a target for completion of 12 to 18 months." Supplement at 2-23.

This short timeline cannot accommodate the necessary analysis of cultural resource impacts the Supplement itself acknowledges are necessary at a project-specific level (*see* Supplement at 2-18), much less the required government-to-government consultation under Section 106 of the National Historic Preservation Act ("NHPA"). If BLM intends to promise quick review of applications, more studies must be conducted before the agency defines the SEZ boundaries and exclusion areas.

Moreover, the Bureau cannot use these self-imposed timelines to short-circuit the consultation process required by the NHPA. "The consultation requirement is not an empty formality; rather, it 'must recognize the government-to-government relationship between the Federal Government and Indian tribes' and is to be 'conducted in a manner sensitive to the concerns and needs of the Indian tribe.' [36 C.F.R.] § 800.2(c)(2)(ii)(C)." *Quechan Tribe of Fort Yuma Indian Reservation v. U.S. Dept. of Interior*, 755 F.Supp.2d 1104, 1108-09 (S.D. Cal. 2010). Given BLM's recent practice of deferring cultural resource identification and evaluation until after project approval, through improper reliance on Programmatic Agreements, CRIT is concerned that project-specific approvals might occur prior to adequate cultural resource evaluations.

CRIT is skeptical that adequate and meaningful consultation can occur for all projects within the proposed SEZs within this 12-to-18-month timeline. Given the current hold on projects submitted after June 30, 2009, BLM already has a backlog of proposed projects. Once the PEIS is finalized, additional proposals are likely. With limited time and resources, CRIT is unlikely to be able to offer meaningful consultation on many concurrent applications in such a short time period.

The final PEIS should reflect this reality. In addition, BLM should require all project applicants to pay a cultural resources mitigation fee for use by Tribes to offset the costs necessarily incurred in reviewing proposals and potentially hiring experts to review the technical cultural resource analysis provided. Numerous Tribal representatives requested funding to allow for meaningful participation in this process at the Tribal-Federal Leadership Meetings on the DRECP. A mitigation fee would provide a non-governmental source for that funding.

In addition to unrealistic fast-tracking, the Modified Alternative also offers insufficient protections against development outside the SEZs. While providing incentives for utility-scale solar development in certain areas identified as SEZs, this alternative continues to allow development on up to 20 million acres across the six state area through both the variance procedure and the approval of existing applications. Supplement at 2-43. The proposed variance procedure, which varies only slightly from the current project-by-project approach, is not stringent enough to discourage an onslaught of applications for projects outside of SEZs, with corresponding consultation and review requirements. This problem will be exacerbated by allowing Projects proposed prior to 2009 to move forward without meeting the requirements of any final PEIS. The variance procedure is also inconsistent with a primary purpose of the PEIS, which is to identify those areas appropriate for solar development now – not on a case-by-case basis in the future.

III. The Programmatic Agreement Should Require Avoidance of Cultural Resources and Ongoing Consultation.

On Thursday, January 26, 2012, CRIT was in contact with BLM John Kalish, Field Office Manager, South Coast Field Office, to obtain a copy of the Programmatic Agreement, but was unable to obtain a copy of the document prior to completing this comment letter. As such, the following comments are based on information contained in the PEIS and the Tribes' experience with previous project-level programmatic agreements. CRIT therefore requests an extension of time to provide its comments on the Programmatic Agreement.

Any programmatic agreement proposed by the Bureau must place the strongest possible priority on avoidance of cultural resources and be fully consistent with Section 106 of the NHPA and its implementing regulations. Proposed projects should be designed to avoid all cultural resources, through siting decisions and

choice of technology. Further, if unanticipated discoveries are made during development of the proposed project, project development should halt until all potentially interested tribes are consulted. Before developing a plan to excavate and record these discoveries, the Bureau must attempt to avoid them, and should explicitly retain authority in any approval documents to require post-approval changes to projects to do so.

To be clear, CRIT does not believe that "excavation" and "data recovery" mitigate the disturbance of their ancestors remains, funerary objects, or other sacred and important artifacts. Thus, every possible effort must be made to avoid such resources. Proper investigation upfront, combined with modifications of project design or location, should be considered prior to a default "mitigation" strategy of data recovery. This approach is also more consistent with the California Environmental Quality Act, which will likely apply to all projects developed in California and which requires resource impacts to be mitigated below the level of significance.

The Supplement also states that "the BLM will invite Tribes to participate in site-specific proposals within SEZs." Supplement at 2-23. Participation, however, is not the same thing as consultation. The Programmatic Agreement must explain how the BLM is going to engage in consultation with Tribes under Section 106 of the NHPA for all individual proposals within the SEZs.

IV. Ethnographic Studies Should Be Completed For Arizona and California.

The Supplement notes that ethnographic overviews have been completed for the six tribes in the Great Basin. Supplement at 2-23. The Supplement continues that:

> "BLM will contact all other Tribes with cultural and/or historical ties to the SEZs and lands available for development to explore if they share similar concerns or issues to those revealed in the study. Field offices in California and Nevada will consult with those Tribes who provided written comments on the Draft Solar PEIS to explain how their concerns will be taken into account and how Tribal consultation will continue under project-specific applications. A written explanation for how the BLM utilized Tribal input in determining Final Solar PEIS decisions will be mailed to all Tribes with the signing of the ROD."

Id. Ethnographic studies should be completed for tribes in the remaining areas analyzed in the PEIS in order to adequately understand the potential cultural resources impacts created by the proposed project. In addition, the consultation

referenced for the CA and NV field offices should not, and legally cannot, be limited to only those Tribes that provided written comments on the Draft Solar PEIS.

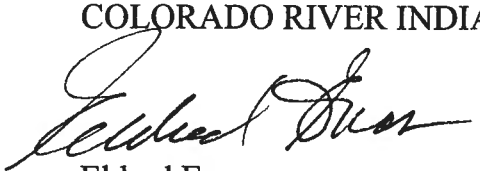
V. The Identification of New SEZs Must Include Early Consultation with Tribes.

The Supplement states that "The BLM welcomes . . . Tribes . . . to participate in [] efforts to identify new SEZs." Supplement at 2-28. Given that inclusion of land within an SEZ amounts to an affirmative statement by BLM that these areas are well-suited for development (including as to cultural resources), the development of new SEZs must include meaningful consultation with Tribes. While Appendix D recognizes that consultation must take place prior to issuing the record of decision (Supplement at D-7), consultation must actually occur much earlier in the process to be meaningful. *See Quechan Tribe of Fort Yuma Indian Reservation*, 755 F.Supp.2d at 1119; *see also* Department of the Interior Policy on Consultation with Indian Tribes (Dec. 1, 2011) (requiring BLM to consult with affected Indian tribes in the "Initial Planning Stage" and "as early as possible.").

Moreover, CRIT does not believe that the Bureau engaged in adequate consultation for the Solar Energy Development Program analyzed in the PEIS. As documented in Appendix K to the PEIS, CRIT received two letters regarding preparation of the PEIS. The first, sent June 24, 2008, invites CRIT to participate as a "cooperating agency." PEIS at K-52 to 54. While the letter mentions that "government-to-government consultation will continue" (*id.* at K-53), the letter does not provide any specifics about that process. The second letter, sent July 1, 2009, offers only a brief invitation: "Please contact us . . . if you would like to enter into government-to-government consultation." PEIS at K-58. For a project with such far-reaching consequences and potential impacts to cultural resources, more than simply notifying the Tribes of the proposed program's existence was required.

Very truly yours,

COLORADO RIVER INDIAN TRIBES



Eldred Enas
Tribal Council Chairman

cc: Tribal Council
Ken Salazar, Secretary of the Interior
Bob Abbey, Director, Bureau of Land Management

Larry Echo Hawk, Assistant Secretary for Indian Affairs
James G. Kenna, California State Director, Bureau of Land Management
John Kalish, Field Office Manager, Bureau of Land Management
Janice Staudte, Superintendent, Bureau of Indian Affairs
Eric Shepard, Attorney General
Lisa Swick, Acting Museum Director
Ron Escobar, Tribal Secretary/Treasurer, Chemehuevi Tribe
Linda Otero, Tribal Council, Fort Mojave Indian Tribe
John Bathke, Historic Preservation Officer, Quechan Indian Nation
H. Jill McCormick, Cultural Resources Manager, Cocopah Indian Tribe
Winter King, Shute, Mihaly & Weinberger, LLP

Renewable Energy & Desert Planning Meeting

Spa Hotel and Conference Center

Palm Springs, California

September 21-22, 2011

PLENARY SESSION NOTES

Prepared

By

Dr. Stephanie Damadio, Senior Program Analyst

Tribal Federal Leadership Conference Coordinator

Bureau of Land Management

October 12, 2011

Introduction

California desert area tribal leaders expressed a desire to meet with senior management of Department of the Interior (DOI) agencies to discuss their concerns and interests in the California Desert Conservation Area Plan (CDCAP), currently being amended, and the Desert Renewable Energy Conservation Plan (DRECP), currently being developed. Tribal leaders asked to be provided an opportunity to have input into these and other efforts to guide land management priorities for the coming years. In response to these requests, DOI invited 40 desert area federally recognized tribes to an initial meeting, the *Tribal-Federal Leadership Conference, Renewable Energy and Desert Planning Meeting* (*Meeting*), September 21-22, 2011 in Palm Springs, California. This meeting was the first step in establishing a more effective and efficient process for tribes to participate and inform land use planning, resource protection and future renewable energy development.

The *Meeting* was not a "Listening Session" or "Consultation" on a federal project or program but rather, provided an initial forum for tribal representatives to have discussions with federal executives regarding a comprehensive planning effort by DOI in the California Desert. Tribal participation at this and subsequent meetings over the next year and a half will inform land and natural resource management, protection and the development of renewable energy in cooperation and coordination with the region's tribal governments. The goal of this planning effort is NOT to review/approve specific renewable energy projects but to produce a tool to guide the planning of resource management in the desert.

The *Meeting* consisted of a description of proposed planning efforts by senior federal executives from the Bureau of Land Management, Fish and Wildlife Service, Pacific Regional Solicitor's Office, Department of the Interior's Office of Policy Analysis, Department of Interiors Office of Indian Affairs and the Counselor to the Secretary of the Interior. The federal executives presented a discussion of opportunities for tribal participation which were followed by tribal presentations addressing top tribal priorities and issues such as reservation development, resource concerns and priorities for federal/tribal coordination. A breakout session was conducted on the morning of September 22, 2011, providing an opportunity for more focused discussion by federal and tribal participants of the issues raised in the previous day's meeting.

At the conclusion of the *Meeting*, numerous commitments were made to California Desert Tribes by DOI leadership. Those commitments included:

1. A letter to California desert region's federally recognized tribes outlining commitments (Sent September 27, 2011);
2. Copies of the proceedings from the September 21, 2011 Plenary Session;
3. Bureau of Land Management (BLM) will schedule a November follow-up meeting with tribal leaders to discuss progress and a path forward;
4. BLM management, not consultants, to meet with individual tribes in the next 30-45 days; and,
5. BLM DRECP Project Manager Vicki Campbell meeting with tribal technical staff and planners.

This document, *Tribal-Federal Leadership Conference, Renewable Energy and Desert Planning Meeting, Plenary Session Notes,* fulfills commitment 2 and is being distributed to the concerned federally recognized California Desert area tribes.

Tribal-Federal Leadership Conference

Plenary Session Notes

Renewable Energy & Desert Planning Meeting at the Spa Hotel and Conference Center Palm Springs, CA

Wednesday, September 21, 2011

9:00 - 9:30 A.M. Sign In and Continental Breakfast

9:30 A.M. Plenary Session Convened

Welcoming statements and a prayer were made by meeting Facilitator **Joseph Myers, Director, National Indian Justice Center.** Mr. Myers reminded all in attendance this was not a Listening Conference but an effort to seek advice from tribes collectively to create a participatory planning process. He reiterated that consulting with tribal governments should be done on an individual basis.

Chairman Richard Milanovich, Agua Caliente Band of Cahuilla Indians welcomed everyone to this two day conference. He reminded the participants to speak up to the federal agencies present. **Bob Laidlaw, Senior Policy Analyst, Office of the Secretary of the Interior** was thanked for facilitating this opportunity for federal agency leaders to listen to tribes and their priorities for resource management. Mr. Milanovich urged all parties to give this cooperative process time to work, since the federal participants were showing a strong willingness to listen to tribes and their positions. He asked everyone to think outside the box and to prioritize tribal needs. He recalled the numerous historic times that Federal, State and the Agua Caliente Tribal government partnered to create laws such as the one that created the Santa Rosa and San Jacinto Mountains National Monument in Palm Springs. Mr. Milanovich voiced his concern regarding the federal tax policy (Tax Code 26 USC 168) which negatively affects tribes.

Facilitator Myers asked **Counselor to the Secretary of the Interior, Steven Black**, and Mr. Laidlaw to introduce the attendees from the various federal agencies.

Mr. Laidlaw noted that there has never before been a landscape level planning effort with tribes that has included as many federal agencies. The federal participants present included:

Department of the Interior (DOI)
Steven Black, Councilor to the Secretary
Joel Clement, Director, Office of Policy Analysis
Bob Laidlaw, Senior Policy Analyst
Anthony Walters, External Affairs Director, Assistant Secretary for Indian Affairs

Office of the Solicitor, (SOL) Pacific Southwest Region
Daniel Shillito, Regional Solicitor
Clementine Josephson, Deputy Regional Solicitor
Erica Niebauer, Attorney

Bureau of Land Management-California (BLM)
James Kenna, State Director,
Thomas Pogacnik, Deputy State Director
Vicki Campbell, Project Director, Desert Renewable Energy Conservation Plan (DRECP)
Stephanie Damadio, Senior Program Analyst
Teri Raml, California Desert District (CDD) Manager
Mark Purdy, CDD Tribal Coordinator

Fish and Wildlife Service (FWS)
Alexandra Pitts, Regional Deputy Director, Sacramento
Michael Fris, Assistant Regional Director
Ken Corey,

Bureau of Indian Affairs (BIA)
Mike Smith, Deputy Director, Tribal Operations
Roger Knight, Office of Indian Energy and Economic Development
Kevin Bearquiver, Deputy Pacific Regional Director

Mr. Black pointed out the senior level of leadership that was present from BLM, FWS and BIA, that they are committed to this effort, and thanked them for starting this dialogue on economic development opportunities, the protection of endangered species and other natural and cultural resources. He noted the Desert Renewal Energy Conservation Plan (DRECP) is a comprehensive desert plan that will affect the entire California desert region over the next century. He remarked that it is important to participate now, given that the land use and conservation area plans were last substantially amended in the 1980s. Mr. Black urged those present to voice their concerns related to water, cultural resources or other issues they want federal agencies to be aware of in renewable energy planning. Mr. Black spoke on behalf of the Secretary of Interior, Ken Salazar, who he said is a champion of tribal concerns and who takes his obligation to tribes seriously. Given that Secretary Salazar comes from a rural community in the San Luis Valley, he understands most tribal situations and tries to fulfill his obligations with appropriate staff appointments. Mr. Black reminded all that the agencies present want to meet on a government-to-government basis and are committed to a dialogue. He added that, even though renewable energy was a catalyst for this dialog with tribes, the current site planning maps do not depict renewable energy development on tribal lands.

Mr. James Kenna, State Director, BLM voiced his honor to be present at this meeting and added that the relationships in this initiative would be both on the leadership level in addition to working individually tribe by tribe.

Mr. Laidlaw added that the input received would guide renewable energy planning, land use and protection in the desert for the next 20 years and would include the issues and priorities of the different tribes and their reservations. Mr. Laidlaw emphasized that this large regional planning effort was a significant departure from traditional project-by-project coordination and consultation with Tribes. Mr. Laidlaw further emphasized that participation in this planning effort could help agencies to direct project development to areas with a minimum of cultural and natural resource conflicts and provide the tribes an opportunity to shape future energy and desert land management planning. Comparing the current effort to the original California Desert Plan, Mr. Laidlaw pointed out that the guidelines of the current 1980 Land Use Plan (Plan) anticipate, and provide for, revisions and amendments if priorities or management conditions change: renewable energy development represents such a change. This conference is to introduce the agencies and the process by which planning outreach to the Tribes is being undertaken. Tribal consultation in this planning effort represents a far more affirmative and comprehensive paradigm for government-to-government collaboration than the project-by-project approach, and introduces a mechanism for working with tribes on a broad landscape (regional) level. This cooperative approach to regional planning can reduce the coordination and consultation burden on tribes associated with project-by-project consultation and provide a means for tribes to help identify areas for future development which avoid sensitive resources. Tribal input in this process also offers a means to identify tribal interest in development of renewable energy on their lands.

Facilitator Myers asked the tribal representatives that were present to introduce themselves. Tribal representatives present included:

Agua Caliente Band of Cahuilla Indians
Savana Saubel, Council Member
Tom Davis, Chief Planning and Development Officer
Todd Hooks, Economic Development Director
Margaret Park, Director of Planning and Natural Resources
Mark Dansby, Economic Development Project Manager

Cahuilla Band of Mission Indians of the Cahuilla Reservation
Brian Bahorie, Environmental Director

Colorado River Indian Tribes of the Colorado River Indian Reservation
Eric Shepard, Attorney General
Mervig Scott, Tribal Council Secretary
Doug Bonamici, Legal Counsel

Cocopah Tribe
Alan Hatcher, Tribal Member

Fort Independence Indian Community of Paiute Indians of the Fort Independence Reservation
Jeremiah Joseph, Water Quality Manager

Fort Mojave Indian Tribe
Linda Otero, Council Member
Colleen Garcia, Council Member

Manzanita Band of Diegueno Mission Indians of the Manzanita Reservation
Jeff Riolo, Representative

Quechan Tribe of the Fort Yuma Indian Reservation
Lorey Cachora, Consultant

San Manuel Band of Serrano Mission Indians of the San Manuel Reservation
Anthony Madrigal, Cultural Resources
Torres-Martinez Desert Cahuilla Indians
Raymond Torres, Vice Chairman
Ben Scoville, Planning/GIS

Viejas (Baron Long) Group of Capitan Grande Band of Mission Indians of the Viejas Reservation
Kimberly Metter, General Counsel

Mr. Pogacnik, Deputy State Director, BLM, introduced the DRECP which involves the creation of a landscape level conservation plan to protect resources in the California Desert and facilitate the development of renewable energy projects. He explained he had both an opportunity and a challenge in conserving desert resources for the long term while advancing renewable energy resources on a project-by-project basis. Mr. Pogacnik added that the main question was how to illustrate the juxtaposition of resource values, opportunities and sensitivity on one map.

He said that five years ago the energy industry was asked for input and applications where they thought the best locations were for renewable energy projects. The federal government received over 100 responses. Now, with this new beginning of direct dialogue with tribes, the intent is for tribal leaders to provide information to the federal agencies regarding the best areas to place projects as well as what areas should be avoided. Mr. Pogacnik added that there was the potential of a large commitment of land in Southern California for renewable energy development. These lands could include areas that are sacred to tribal peoples, therefore, tribal input was extremely important if this process was to be able to identify and protect such values. For these reasons, federal/tribal planning partnerships needed to be created. With this goal in

mind, government-to-government consultations for planning and resource identification will be scheduled in the next 45 days or so to assure the DRECP is informed by tribal participation.

Mr. Pogacnik mentioned the challenges that renewable energy projects have had on a project-by-project basis and added that the desire through this planning process was to avoid future conflicts wherever possible. He listed a number of questions that the different agencies had for tribes such as; what is the right approach, what are your tribe's specific needs, do you need Geographic Information System (GIS) assistance, etc. He asked tribal leaders to identify the necessary tools and resources they need to successfully participate in the planning process. Mr. Pogacnik added that the purpose of the DRECP was to provide for the renewable energy development in the California Desert in a manner which conserves wildlife habitat and tribal cultural sites.

Facilitator Myers asked the panel and Mr. Pogacnik their opinion of the Bill (proposed legislation) introduced by Senator Dianne Feinstein calling for a monument that affects Southern California tribes.

Mr. Pogacnik said the Bill was in its initial procedural stages and deals with resource conservation. He noted, as we move forward in dealing with issues it will be important to obtain input from tribes to advance the conversation. He reminded the audience of the Agency's commitment to government-to-government meetings that will be scheduled in approximately 45 days. He added that Tribal Administration offices would be contacted to coordinate scheduling of these meetings in a formal and confidential forum with each individual Tribe.

Vicki Campbell, BLM Project Director, DRECP presented a power point on DRECP. She explained that this planning effort is unprecedented in its scale and commitment to outreach and collaboration. The Plan includes six counties or an approximately 22.5 million acre study area of which about 10 million acres are managed by BLM. This cooperative effort is mainly being conducted by the BLM, FWS, California Energy Commission and the California Department of Fish and Game. The DRECP's purpose is to advance state and federal natural resource protection goals in the Southern California desert regions while also facilitating the timely and streamlined permitting of renewable energy projects under applicable State and Federal laws.

The following handouts were made available: Map of the DRECP Planning Area, Map of Federal Lands Overview in the DRECP Planning Area, List of Key Timelines, and Contact and Internet Information Sources.

Maps were provided depicting the currently-proposed area of the DRECP. Ms. Campbell explained that some areas, such as the Coachella Valley located in Riverside County, were removed at the request of specific local authorities in this case, the Coachella Valley Association of Governments, to avoid conflicts and duplication in areas with existing local planning efforts. Among the important potential effects and consequences of the DRECP are amendments to agency policies and management practices such as the BLM California Desert Conservation

Area Plan (CDCA), the BLM Caliente/Bakersfield, Bishop, and Eastern San Diego County Resource Management Plans, Endangered Species Act, Natural Communities Conservation Planning Act Compliance, National Environmental Protection Act (NEPA) and California Environmental Quality Act (CEQA), to name a few. The DRECP will also help streamline more effective permitting for renewable energy projects by the federal and state government.

The DRECP area will address proposed energy activities which include solar (photovoltaic and thermal), wind, geothermal, and transmission. The proposed area is habitat to plants and animals and could potentially affect 650 species. Ms. Campbell added that biological reserves can be enhanced by adding information on tribal-cultural values in the desert. As a planning effort, NEPA and CEQA will also be addressed and satisfied as a component of the process.

It was pointed out that in developing the preliminary conservation strategy of the DRECP the focus has been on important biological areas and federal and non-federal land ownership. The different areas of resource sensitivity in the preliminary map were pointed out. Animal/plant and resource use/protection characteristics, such as the desert tortoise, desert bighorn sheep, condor policy and off road vehicle/recreational areas, were discussed. It was explained that emphasis was given to these areas but these areas may change or expand with input from tribes on other cultural and biological areas and tribal cultural concerns. This information from tribes, once it is received, can be employed to create a "biological, ecosystem, and cultural reserve system map."

A proposed timeline was presented. It called for drafts of the Environmental Impact Statement/Environmental Impact Report alternatives for late November 2011, with a Record of Decision and permit decisions by January 2013.

Those present were reminded of the importance tribal input would have on the DRECP. The various websites available for information such as www.drecp.org were presented.

Mr. Todd Hooks, Economic Development Director, Agua Caliente Band of Cahuilla Indians asked if there were a preliminary number of acres of land needed for renewable energy projects.

Mr. Pogacnik's response was, yes, approximately 500,000 acres, but given that this figure is an estimate from the latest information available, additional analysis needs to be completed.

Mr. Tom Davis, Chief of Planning, Agua Caliente Band of Cahuilla Indians asked if wildlife compliance would be affected. Mr. Pogacnik responded that most likely there would be various land use plan amendments.

Mr. Anthony Madrigal, San Manuel Band of Serrano Mission Indians of the San Manuel Reservation voiced his concerns about providing information on specific traditional and sacred sites. Mr. Madrigal felt the timeline presented was very aggressive and the deadlines were shortly approaching. His concern was that some tribes do not have the resources (budget, people, time) for an initiative like this and a special workgroup could be useful. In addition, it is

important to note that the gathering and sharing of the information will take time. Unfortunately, the information is required rapidly because of the deadlines imposed. The areas the agencies would like to know about for the DRECP are the special areas tribal people value because these are part of tribal culture. He suggested the first priority should be to set up a process to have a real dialogue with tribes, even if that means federal agency leaders need to sit down with each Tribe.

Mr. Pogacnik assured Mr. Madrigal that one of the first follow-ups from this meeting will be the scheduling of government-to-government meetings with individual tribes and agency managers.

Ms. Campbell clarified that the information provided to the DRECP group should be very broad and general - just enough to point out the areas to be able to consolidate the information into a document that can be shared with the public. Additionally, if tribes request, agencies will work with them to provide GIS and planning assistance.

Mr. Riolo, Manzanita Band of Diegueno Mission Indians of the Manzanita Reservation asked what culturally sensitive areas were included in the DRECP map presented.

Ms. Campbell said it was only minimal since Mr. Madrigal, who had some input as a public member of the DRECP group, could only speak to his, the San Manuel Tribe's, culturally sensitive areas. Ms. Campbell added that most of the information mapped is biological, but the purpose of this meeting was to request tribal input to integrate the ecosystems already in data systems with general information from tribes on tribal culturally sensitive areas. The goal of this outreach effort was to significantly increase the opportunity for tribes to participate in this regional planning effort.

Mr. Kenna asked for thoughts on the work group that was suggested by Mr. Madrigal.

Mr. Madrigal answered that it should be a group committed to the project in addition to government-to-government consultations. He added that each Tribe has to be asked how they wish to be involved in this process, since each Tribe might want to have/be capable of different levels of participation. He also noted tribes do not all have resources and for the most part, do not have large tribal cultural resources departments. Overall, it should be an assembled working-group to help tribes participate in the DRECP so they can bring information to the table. It should be a working group that continues throughout the process.

Mr. Scott, Tribal Council Secretary, Colorado River Indian Tribes of the Colorado River Indian Reservation asked if there was a plan covering when a company goes out of business or leaves the project halfway. Is there a clean-up plan, for example?

Mr. Pogacnik described the performance bonding process, clarifying that under this requirement the taxpayers do not have to pay for the clean-up.

Ms. Campbell added that in public lands there is also a bonding process that requires the company to clean up and restore a site and added that this concept could be added to any project.

Mr. Black emphasized that the natural and cultural resource information for California Desert planning ultimately needs to be in GIS format so it can be mapped and considered. He asked if Mr. Madrigal would like to help create the suggested workgroup. Mr. Black's understanding was this group would be made up of tribal and federal individuals working together to a common goal.

There was a general discussion by the group at large in which it was emphasized that this dialog between agencies and tribes in the desert was expected to cover a wide range of issues and potential resource impacts. Some of the issues intersect and articulate with habitat, traditional values, reservation renewable energy development opportunities and groundwater issues. The DRECP was emphasized as offering a unique opportunity for coordinating these discussions as tribal input to the DRECP could serve as a starting point for subsequent discussions between BLM and individual tribes.

Meeting Break for Lunch 12:30 – 1:30 P.M.

Reconvened: 1:32 P.M.

Mr. Daniel Shillito, Regional Solicitor, as follow up to Chairman Milanovich's concerns regarding Tax Code 26 USC 168, that will end this year will negatively affect tribes if it is not extended in Congress. There are current provisions where in one can have property with 30 or 60 year accelerated depression. Tribes can ask for parity by requesting the same treatment under law as utilitys with regards to tax credits.

Mr. Anthony Walters, External Affairs Director for Assistant Secretary for Indian Affairs returned the conversation to the DRECP, noting the advantage of tribes being involved early before the Plan is completed as DRECP project members do not have to react to the input once the document is published. It is important for tribes to get involved early in this process to have more input.

Mr. Laidlaw reiterated that the federal representatives needed to hear from tribes as to how best to engage them in DRECP and related planning discussions over the next year and a half to assure tribal concerns are identified and addressed. He pointed out the federal representatives present provided the opportunity for open communication with the different agencies of the government. He noted that breakout rooms were reserved to continue specific discussion as needed.

Ms. Linda Otero, Council Member, Fort Mojave Indian Tribe thanked Chairman Milanovich and the Agua Caliente Tribe for hosting this meeting. She added that she is the Director of the Ahamakav Cultural Society in Arizona and it is a driving force of what she does. She wants to have in the record that:

Tribal input is important in the DRECP and should be strongly considered in the decision making process.

Tribes have worked many hours and weeks on the topic of solar energy because they too believe it is important.

Tribal concerns should be taken to the highest levels and should be heard in Washington, DC.

Her "River People" Tribe presented an official letter to President Obama stating their concerns of the fast-track projects. The Tribe is making a proactive effort; it does not want to be reactive.

The area included in the map shows the ancestral lands of tribal people. Many of the people of the lower Colorado River are included in this area. She noted that the River People thrived throughout time and future generations will move into the future integrated with the environment.

The land has layers of sites of people who have been here centuries. What today looks like a stream used to be a river that flourishes; this is a connection to the Tribal River People.

Tribal people teach the young ones so they will carry on the ways of their culture.

Every act of Congress affects tribes. Historically, tribal input has been missing but times are changing. She added that she has stood in the record on Washington, DC and her Tribe will take every opportunity to be heard. The intent today is to move forward.

Tribes are working with the Western Regional Partnership to take back the management responsibility; heritage resources are limited so it is managed to the best of the Tribe's abilities.

Information has to move up the Agency's chain of command to make resources necessary available to those staff members at bottom.

The government needs to acknowledge that the environment needs to recover from the damage. Policy will affect tribes into the years beyond. Efforts should be stepped up so wilderness zones are reviewed and protected.

The Fort Mojave Indian Tribe at one point in time was a Nation; the Tribe is both water and land. Actions by the US Government and the Tribe should be done with respect.

There are layers of actions that need to be reviewed to be able to show on a map. Some of the wilderness zones are mountainous regions.

There have been meetings before and information has been shared; therefore, the federal agencies do not need to start at "square one." They can draw information from what was said before.

She keeps hearing of the renewable energy projects moving fast but, "thriving is moving in balance with nature." Her people are for renewable energy and they understand that this is moving fast because of the economics and the funding behind it. She asked that those present be open minded to see that not just a large land base is being disrupted. She presented a picture of one project showing disruption. She asked how the historical

damage will be addressed, it is not just about monitoring it is about safeguarding the environment.

Of critical interest is to have the protection of places that are non-renewable.

Water is another important aspect. It needs to be understood that during construction water is needed. Water is being siphoned out by projects with water wells. Water is a heavy topic for Southern Tribes and it needs to be acknowledged. There is water that is being siphoned out from the springs that feed into the Colorado River.

Projects that involve both state and federal agencies do not always work smoothly, but hopefully, tribes have more input so what is important to them gets included in the implementation.

Ms. Otero ended her statements by voicing her disappointment that Secretary Salazar toured her tribal area by air, but she did not receive answers to her letters. It seemed, to her, that her tribal concerns were not taken seriously.

Mr. Laidlaw acknowledged the difficulty of communicating with the federal, state, and local agencies and suggested that this effort led by BLM could help tribes be included in broader conversations involving desert resources.

Mr. Pogacnik, emphasized that in this process, the next step would be to have government-to-government consultations and asked those present for their partnership and help in getting guidance from their tribes as how to best accomplish these and subsequent meetings.

Erika Niebauer, Associate Attorney, Regional Solicitor's Office, pointed out that there are tools that could be used by the Bureau and there are areas that could be identified by the sharing of information process.

Ms. Otero reminded the group that, historically, information shared with government agencies has been used against tribes and tribal resources continue to be erased.

Ms. Campbell added that the agencies want to hear from tribes. Now, knowing the tribal interest of restoring damaged areas, it could lead to work to have money focused on a reserve system.

Ms. Otero added that some areas have elements that simply cannot be restored because some things are gone.

Mr. Madrigal voiced his concerns of long-term issues that should be addressed with long-term planning and asked for the agencies' commitment to this. Tribes can provide information on trails, etc., but tribes need to be taught the planning procedures in order to be of better assistance. He reiterated that a strong commitment with resources will be necessary for a long lasting relationship to be created.

Mr. Lorey Cachora, Consultant and Government Member, Quechan Tribe of the Fort Yuma Indian Reservation made a statement that included the following main points:

His Tribe practices its own culture, administration, elections, etc., but wants to have a dialogue. The local area tribes have been separated by differences such as fishing, planting and harvesting, but all the people produced horticulture because they grow from the sand.

Spirit Mountain in Laughlin, NV is a sacred place. How do tribes comply with the request for information?

He is concerned with the sudden urge with renewable energy and the fact that rules and regulations that have been around and asked be obeyed for years are now being overruled.

He was saddened by the fast pace of "going green" (renewable resource projects) because it was "disturbing to see." Given his personal and historical experience, there is some guidance that should be followed.

The concern is that when rules are changed, he expects the federal and state agencies to follow these rules just as the tribal people follow them.

The fast approaching deadline of the DRECP is of great concern, given that there is so much about the River Corridor that needs to be explained from rock alignments, cliffs, pictographs, etc. All are of great importance. The ancestors went all the way to South America and back.

Elders keep hidden what they know so it will take time to gather the information, especially with an area that goes North, South, East, and West of the River Corridor. Science and scientists have been a danger with their desire to collect artifacts; they have cleared the desert.

It will be hard to map sacred places because artifacts are no longer there.

Mr. Frank Brown, Tribal Member of Viejas (Baron Long) Group of Capitan Grande Band of Mission Indians of the Viejas Reservation thanked all for letting him speak. He made a statement that included the following main points:

In San Diego County the Tribe is experiencing miscommunication with the local BLM and it seems they are not cooperative.

Mr. Brown is the Chairman of the *Inter-Tribal Cultural Council*, of the 13 Kumeyaay Nations. He represents the majority with respect to culture. The Kumeyaay have been around for 10,000 years. It is impossible to present a report in this short notice.

Mr. Brown asked if the report with the information requested is presented, will the lands be protected.

Ms. Campbell informed that the stakeholder's group started a meeting one and half years ago and added that this is an ongoing plan of the overview of DRECP. The cultural aspects of the area are unknown; therefore, the general information is being requested.

Mr. Brown continued his remarks, including the following main points:

At a project in his area, the BLM representative was concerned about dinosaur bones and biology more than tribal ancestors. Mr. Brown is a monitor for the Ocotillo Express Wind Project but archeologists working on the site never listened to him nor were his words in the official record. It is disrespectful for workers on the site to mainly talk about dinosaurs and birds, but not care about culture. In one particular project there were six sites with pictographs and hieroglyphs, but the focus was on animals.

He asked if the information given for the DRECP would be implemented and if it would affect current/on-going projects.

Mr. Black explained that everyone is trying to take advantage of the near-term opportunities and also move the President's agenda forward. With respect to specific projects' application and compliance under Section 106, all of the federal agencies are committed to doing better under each specific circumstance. The desire is to have a foundation as soon as possible to direct industry to correct locations that preserve the integrated system.

Mr. Pogacnik explained that for the most part everyone has been on this project-by-project application-driven world and now the agencies are trying to create some capacity for individual communication with tribes that will stay open over time.

Mr. Brown asked if the timeline could be pushed back given the tribal concerns of disturbance of cultural sites.

Ms. Campbell, replied that the DRECP timeline was what she had presented but the commitment of agencies to work with Tribes was on-going.

Mr. Laidlaw talked about the opportunity of working as cooperating governments and asked tribes to consider this a starting point which has the opportunity to change the relationship with these agencies. He added that agencies need to talk more broadly with tribes about their programs so tribes can share their concerns as well as identify opportunities. He and others hope the outcome is a change in the way business is done. The agencies wish to find out what works best for each individual Tribe.

A question was again raised about the Monument Bill that Senator Feinstein is working on.

Mr. Black responded that the Department has worked with the Senator as related to boundaries, but it is important to focus on the purposes of the Bill which is to identify areas of conservation.

Mr. Brown asked those federal agencies present to contact the local tribes to identify the cultural landscapes and territory which is the most important to them.

Ben Scoville, Planning/GIS for the Torres-Martinez Desert Cahuilla Indians made a statement that included the following main points:

The Tribes' cultural resources are very important as well as renewable energy.

The Tribe is lacking information and resources to do surveys with cultural monitors to identify the land. It is best to identify sites early so projects work smoothly.
The Tribe has tremendous potential for solar and geothermal projects; but the resources are the difficult issue.

Mr. Scoville asked if there was a way for tribes to obtain resources for strategic development. Is there a possibility to have preference on developing projects in a culturally sensitive and correct way and can tribes be participants in the renewable action team as a stakeholder? Mr. Scoville also asked if there is any way to ensure that renewable energy projects will not negatively affect the opportunities on tribal lands.

On a separate issue, Mr. Scoville pointed out that Torres-Martinez has not been able to benefit from their Settlement Act. One third of the reservation is underwater in the Salton Sea and fee-to-trust and land exchanges are something the Tribe would like to look into and have the broader planning process consider.

Mr. Walters directed Mr. Scoville to the Office of Indian Energy and Economic Development with the BIA which works with tribes on issues of competitive grants and does studies on possible projects. He urged tribes to also provide input as to where they would like to have future possible renewable energy projects in their area.

Mr. Black emphasized the need for all of the agencies to follow up with those present and added that meetings are held monthly with a large group of interested parties called Renewable Energy Action Teams. An invitation was extended for tribal representatives to attend those meetings. Additional information was provided indicating some meetings are posted online and others have conference lines for participants to call in.

Facilitator Myers, spoke of a Bill that defines tribes to be as public entities and inquired how that might affect tribal outreach and coordination. .

Ms. Campbell indicated she would discuss that issue and also noted there are various meetings, some weekly, some monthly, and asked that those who wanted to participate contact her for information. She added that DRECP's title has a focus on conservation, but it is equally important to hear where tribes would like to see development occur.

Mr. Shillito voiced an idea to get money for tribes that need resources by earmarking money for particular areas so the funds could be made available to assist tribes in more effective planning participation.

Mr. Cachora made a statement that included the following main points:

If agencies have DRECP meetings "all the time," why is it that the tribes are just now learning about them even though three or four months ago there was an energy project moving forward without tribal input or tribal consultation? The Tribe was told that survey was completed, but without tribal input. How much can be known of the Tribe.

Mr. Cachora presented the example of one solar project in which culturally significant vegetation was cut down without tribal input; even though "artifacts grow within it". The land of this project was also "arbitrarily fenced". All this was done just to move the project forward at the California Energy Commission's request. This is just an example of government-to-government misunderstanding.

The words "government-to-government," communication are not always understood the same way by the government and the tribes. Working with consultants or sending letters that ask for a signature at the bottom is not tribal consultation.

There is mistrust for federal agency requests for communication.

Looking at some maps, it seems like a renewable energy land-grab. How many of the projects will serve California's interest and how many are just for money to sell electricity elsewhere?

This fast-paced stimulus program is not a way to deal with employment issues.

Mr. Kenna answered that the map (of existing projects) is random or may look like a "land-grab" because industry told us where they wanted to go. Now, with the DRECP, the government will tell them where they can go. The information gathered will help decision making in the application process. There were over 100 applications, most were from speculators who were rejected; this too frustrated the federal government.

Ms. Campbell spoke of the difficulty in knowing how many projects were needed because of the many aspects and the speculations of energy needs for the next 50 years. Some educated guesses are that 65% of the need of electricity production will come from the desert or about 1.5 million acres.

Mr. Black directed those present to the BIA with regards to the eligibility for loans and reminded the group that there might also be tax credits or other opportunities for tribes. It is also important for those tribes interested in participating in renewable energy development share that interest with the planning team. For this reason, as well as sensitive resource identification, tribal input was essential to moving the DRECP forward.

Mr. Cachora asked if there was some tool to know what was included in the tentative map. Mr. Kenna responded that information could be posted on the project's webpage.

Mr. Merving Scott, Tribal Council Secretary, Colorado River Indian Tribes (CRIT) made a statement that included the following main points:

Tribes need to know how the information provided by tribes will be protected since these are sacred locations.

He is concerned with the government's lack of ability in protecting sites. He added that some people steal, deface, and break artifacts.

The timeline is also of concern since elders are afraid of sharing the information. It is not as simple as saying "give me your history."

Mr. Laidlaw mentioned that while oral-form copyright agreements have been executed in the past to protect specific conversations, the information being requested for the DRECP is at a very general "landscape" level and should be able to avoid many confidentiality issues. The initial goal of this planning dialog is to assure information that tribes are comfortable sharing is included in the planning and GIS effort. This should also be viewed as an opportunity to establish deeper cooperative efforts between agencies and each Tribe. At the planning level, tribes can tell us the value of desert regions without sharing specifics.

Mr. Kenna added that the maps shared today by Ms. Campbell were tools to show a starting point so tribes could judge what the need is. He recommended creating a mechanism so federal and tribal folks can communicate on a regular basis and be part of the working group.

Ms. Campbell noted the draft DRECP report would be coming out soon, but the best time to obtain input was now.

Mr. Jeremiah Joseph, Water Quality Manager, Fort Independence Indian Community of Paiute Indians of the Fort Independence Reservation, asked if tribes would benefit from renewable projects being close to them.

Mr. Walters answered that there will be some benefits, especially if tribal preferences can be worked into the projects with the BIA.

Mr. Joseph voiced his concerns regarding companies walking away from projects and structures. "If anything negative were to happen, would natural resources be available for the Tribe to be able to survive?"

Alan Hatcher, Tribal Member, Cocopah Tribe, AZ, made a statement that included the following main points:

There are communication inconsistencies with tribes that are in place. These are "process-focused" in nature and a failure.
The timeline presented is almost irreparable; it seems reactive going back to legislation.
What is GIS and what is required for the DRECP.
It seems like the government wants tribes to support this historical process, but the anomalies push tribes to oppose the project, such as a project public hearing without public comment allowed.
Is a recent lawsuit the catalyst for this dialogue?
Meaningful consultation cannot take place while the reports are being completed. The dialogue should be simple communication so tribes are empowered and the communication is meaningful.
The burden is being put on tribes given that the deadline is just a few weeks away.
The renewable energy projects are here and the way things are done have changed.

Mr. Black thanked Mr. Hatcher for his feedback and encouraged all tribal representatives to also share their views for improving this dialog as the federal agencies need tribal guidance and participation.

Break 3:20- 3:30 P.M.

Reconvened 3:33 P.M.

Facilitator Myers voiced his support for effective communication and remarked that form letters do not always do a good job.

Mr. Pogacnik reiterated there was agency interest in arranging multiple meetings with those present, noting this was the beginning of the process. Mr. Pogacnik also emphasized that it is understood that tribal information is very sensitive, but the lines that are drawn in the map do not have to be defended or justified. Tribes are, themselves being asked to identify areas of cultural concern, resource conflict, development interest and natural resource issues. For this reason, ethnological studies are not needed.

Mr. Joel Clement, Director, Office of Policy Analysis noted that a landscape-level process such as the DRECP is meant to even the playing field so all of the competing interests have some input on planning and development, rather than favoring whoever puts in an application for development.

Ms. Campbell added that from a wildlife biologist perspective, she wants lines on a map, but she reminded the group that justifications are not needed.

Mr. Doug Bonamici, Legal Counsel, Colorado River Indian Tribes of the Colorado River Indian Reservation asked if the federal government was going to take the Tribe's word.

Ms. Campbell responded "yes we are."

Ms. Otero said that her people had trusted tribal leaders with the responsibility of taking care of the land. She was glad to hear the Government's new approach. She noted it was difficult to work with agencies or project applicants who hire contractors to talk to the tribes and that this approach goes against most laws. Even though BIA is starved for money and resources, there are a few people out there that she and tribal leaders would be comfortable with. She asked if there was a way to know when a corporation was moving a project forward so that true government-to-government meetings can take place with sufficient time and opportunity for tribal input.

Mr. Pogacnik stated that everyone will trust the data that is going to be provided by tribes in the planning process. Asking tribes to identify their issues and concerns is consistent with the way biologists are being treated when asked to identify habitat concerns. With the use of the

information in the DRECP, if an application for renewable energy development is submitted seeking to work in a protected area, the answer would be no.

Mr. Kenna added that the application-driven world is different than the planning-based approach to future project siting which will result from the DRECP. While there are difficult issues, it is necessary to move forward to create a map. The idea is to have a dialogue before an alternative analysis process is created.

Ms. Campbell stated that the DRECP was California Desert focused, but if lands in close proximity were of interest, the information should be shared in this process so that it may be possible to move the boundaries.

Facilitator Myers excused himself due to a prior commitment and reminded all that consultation should be done with the Tribal Leaders and Government Leaders. He wished the group good luck for the second day of meetings.

It was announced that there were breakout rooms reserved for more in-depth conversations should anyone wish them. The majority of those present said they would attend for the second day of meetings.

A general discussion occurred focusing on the different aspects of laws that could be used in informing the planning process such as NEPA and CEQA. It was noted that FWS was rewriting guidelines that could affect some areas due to the presence of eagles.

Mr. Black urged all to stay when the plenary session ended and reach out to the 15 senior government employees that were present. He then reminded everyone data was needed to populate the DRECP map.

Questions were raised over individual renewable energy projects and it was decided that roundtables would be conducted on day two of the meeting.

Ms. Otero asked who would be meeting with each Tribe.

Mr. Laidlaw and others answered that Field Managers or District Managers or GIS mapping specialists of the BLM would be the main points of contact. The tribal representatives present voiced their concerns that meetings be with agency representatives who have the authority to make decisions.

Mr. Black stated Field Managers do have limited authority and added that the projects that get to the federal government do so because the Field Managers are involved. He noted level of activity in the federal agencies had increased significantly in response to many new project applications.

A discussion was held that focused on the difference in power structure of the federal government, where there is distributed authority and balance between agencies with many

different missions. This was contrasted with tribal governments where a single body or person makes decisions. The difficulties of representative tribal input were discussed.

Questions over commitment issues were raised. It was stated that Tribes could count on the commitment from the current department and agency leadership. These federal agencies want a process including specific strategies which work for each individual Tribe and create true communication.

Ms. Otero remarked how her tribe's government-to-government protocol was redlined by the Solicitor's Office when her Tribe tried to create it.

Mr. Black asked Ms. Otero who would she like to see consult with her Tribe.

Ms. Otero replied, the Secretary of the Interior in a face-to-face meeting.

Mr. Black said he would take the information back to Washington, DC and said that the BLM was in the best position to have the first meetings with tribes due to the way the federal government is organized and since this would be the most efficient way.

Mr. Kenna added that as the new State Director, he would like to visit field offices and check in with tribes that would like to meet with him.

Comments were made by several tribal representatives that consultation regarding an area of Tribal concern or tribal development programs could be complicated by the lack of communication among BLM and other agencies across agency and jurisdictional boundaries (e.g. California and Arizona).

Mr. Laidlaw summed up the federal commitment and next steps to be taken.

Mr. Pogacnik emphasized the commitment of BLM to bring tribes into the planning process and asked that each Tribe make their specific issues, concerns and interests known

Meeting Adjourned 5:00 P.M.

COLORADO RIVER INDIAN TRIBES

Colorado River Indian Reservation

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January 19, 2012

Via E-Mail and U.S. Mail

John Kalish, Field Office Manager
Bureau of Land Management - South Coast Field Office
1202 Bird Center Drive,
Palm Springs, CA, 92262-8001

Re: **Comments on the proposed *(Draft) GEOARCHAEOLOGICAL TRENCHING AND CONTROLLED GRADING EVALUATION PLAN, GENESIS SOLAR ENERGY PROJECT, RIVERSIDE COUNTY, CALIFORNIA***

Dear Mr. Kalish:

The Colorado River Indian Tribes ("CRIT" or "Tribes") welcomes the opportunity to comment on the Geoarchaeological Trenching and Controlled Grading Evaluation Plan ("Trenching Plan") for the Genesis Solar Energy Project "GSEP" or "Project"), as proposed in the December 2011 draft, and now under consideration by your office.

The Colorado River Indian Tribes wish to express significant concerns it has with respect to treatment of cultural materials discovered at the site of the Genesis Solar Energy Project. As a concurring signatory to the GSEP Project Programmatic Agreement ("PA"), on December 6, 2011, CRIT representatives participated telephonically in a meeting with representatives of the Bureau of Land Management ("BLM" or "Bureau"), the Project applicant ("NextEra"), the California Energy Commission ("CEC"), and other Indian tribes in the region. At this meeting, the participants discussed what was described as the "unprecedented" discovery of significant cultural resources at the Project site during grading operations. (Statement of Holly L. Roberts, Associate Field Manager, BLM, South Coast Field Office, regarding nature of discoveries at GSEP, during telephonic conference, December 6, 2011). At that time, a preliminary Trenching Plan had been proffered as a treatment response to the many discoveries then taking place at the GSEP site.

After reflecting on this new information, and engaging in discussions with other area Tribes and BLM – a discussion wherein Bureau personnel also described the discoveries as unprecedented - CRIT agrees with Ms. Roberts – the discoveries at GSEP are indeed unprecedented.

The CRIT Reservation is very close to the site at Dry Ford Lake. CRIT members feel a strong kinship with the people who are represented by the "artifacts" now being churned up at the Project site. CRIT also feels a strong sense of responsibility to honor and protect those people who left the cultural items there long ago. CRIT is pleased that BLM has taken steps to protect cultural values at GSEP, but we remain

concerned that the cultural values assessment itself may be undertaken primarily by archaeologists working for the Project developers (through AECOM), the California Energy Commission (CEC), and the BLM. While we do not doubt the integrity of these entities, we believe that their interests naturally, and necessarily align with the Project's continued development and completion. Tribal interests may lie elsewhere. Certainly, CRIT's interest is in preserving its cultural history. However, without a clear-eyed assessment of the Genesis site, one undertaken by all concerned parties together, Tribal interests may go underrepresented. Thus, CRIT has a number of serious concerns about the Project's impacts on cultural resources, NextEra's compliance with their obligations under the PA, Historic Properties Treatment Plan ("HPTP"), and California Energy Commission Conditions, and BLM's consultation with CRIT. BLM must address these issues before determining whether, and under what conditions, NextEra may be allowed to proceed with construction in the area of these, and future discoveries.

1. Initial Notifications/Consultation Failed to Adhere to Project Requirements:

The GSEP Programmatic Agreement contains a notification and consultation process intended to address treatment of discoveries of cultural materials during construction of the facility. According to representations made at the December 6 meeting, BLM was aware as early as November 14, 2011, that grading activities associated with Project development had revealed and possibly destroyed numerous cultural items associated with a prehistoric human settlement. Yet, CRIT was not notified of this unanticipated find by either NextEra, or BLM until November 29, 2011, more than two weeks later. This delay clearly violated the National Historic Preservation Act and its implementing regulations, which require BLM to notify affected Indian tribes of such discoveries within 48 hours. *See* 36 C.F.R. § 800.13(b)(3); *see also* GSEP Programmatic Agreement (PA), § VI(b) (incorporating requirements of 36 C.F.R. § 800.13(b)(3)).

Further, the California Energy Commission's Licensing Condition CUL-9 also requires notice to affected Tribes within 48 Hours. (*See below: Historic Properties Treatment Plan,* Table 8, pg 6-4.)

Table 8. Schedule of Pre-construction, Construction, and Post-construction Tasks

Ongoing during construction	Within 48 hours of the discovery of a resource of interest to Native Americans, the project owner shall ensure that the CRS notifies all Native American groups that have expressed a desire to be notified of such finds (CUL-9)

CRIT reasonably assumed that its signatory status on the PA adequately communicated, and established its "desire to be notified" of these discoveries.

Subsequent communication between BLM and CRIT Tribal Council and staff has improved. However, the early failure to notify CRIT in a timely manner put the Tribes in a disadvantageous position. Research and response to these issues is time-consuming for all involved. In the interim, more discoveries occurred; more cultural items were destroyed, and more spiritual harm was done. There are only two signatory Tribes on the GSEP Programmatic Agreement. This is a very short list. If, as here, only 50% of the affected signatory Tribes are notified and consulted in a timely manner upon discovery of "unprecedented" cultural resources, it raises profound concerns whether Tribes can ever reasonably be confident that their cultural resources are safe in the hands of BLM or project Developers.

2. BLM must Consider Avoidance as the Preferred Treatment Option for Recent Discoveries at GSEP.

i. BLM Response to Discovery of Artifacts.

According to meeting minutes from a November 29, 2011 conference call between BLM, CEC, AECom and NextEra, it appears that BLM had already committed to allow Project construction to continue on the newly discovered historical site before notifying CRIT of the discovery. For example, these minutes reflect that the conference call participants—which did not include any tribal representatives—were already in the process of preparing a plan to continue grading, so that artifacts would be unearthed and collected as construction continues, rather than avoided. This pre-existing commitment failed to meet the BLM's obligation to consult with Indian tribes before committing to such a course of action. CRIT is very concerned that such a commitment renders any future "consultation" with CRIT or any other tribe, perfunctory.

Moreover, it appeared from these minutes—as well as from the tenor of the December 6 meeting—that neither NextEra nor BLM had considered avoidance of the discovered site as a method of mitigating significant, adverse impacts to cultural resources, even though the Programmatic Agreement expressly identifies avoidance as the preferred method of mitigation. *See, e.g.*, Programmatic Agreement, App. B, § III(a)(ii) ("For cultural resources, the preferred method of mitigation is avoidance of all cultural resources to the maximum extent practicable."); *id.*, App. J, § 2.0 ("Avoidance of all cultural resources is preferred and is the goal of BLM."). Only if avoidance is infeasible should BLM consider allowing adverse impacts to be mitigated by "data recovery" and excavation. *See id.* Programmatic Agreement, App. B, § III(a)(iii)(1); *id.* App. J § 2.0. Avoidance is recognized as the preferred mitigation method by the California Energy Commission in its decision approving the Project. *See* CEC Decision, § VI(C), Findings of Fact #9.

The HTPT is replete with promises – some more specific than others - that avoidance will be considered as a treatment option. Examples from the May, 2011 version of the HTPT include the statement "[t]he avoidance of all cultural items and sites should be considered where feasible." (Chapter 9.0, Mitigation Plan / Plan For Discovery Of Cultural Resources.) This same statement, though somewhat vague as to its intended application, appears several times throughout the Chapter.
The title of Chapter 9.2, "Definition Of Unanticipated Discoveries Where Avoidance Is Not Required—Prescribed Treatment" suggests that there are corresponding discoveries where avoidance *will* be required.
A more specific promise appears in Chapter 9.4.2, entitled Site Evaluation Methods, which contains the following passage;

"Site avoidance will be the preferred method of dealing with cultural resources during construction of the GSEP. However, if a newly discovered resource is potentially significant and if avoiding the resource proves infeasible (as determined though consultation between the CRS, the project owner, the CEC CPM, BLM, PTNCL and DTCCT specialist (if applicable), and SHPO), then site evaluation will proceed.

Avoidance is also CRIT's preferred treatment alternative. The same preference was expressed by several Tribes attending the December 6, 2011 planning meeting referenced above. Though NextEra's Project representatives asserted that avoidance of the area where recent discoveries occurred would be infeasible, and would result in there being "no project," neither NextEra, its technical contractor, AECom, nor BLM has provided CRIT with evidence indicating that avoidance is not feasible. Indeed,

when the Bureau analyzed a "Reduced Size Alternative" in the Draft EIS for the project, it specifically noted that "no evidence has been provided to demonstrate" that "a 250 MW size project is an optimal size," as the developer urged, and that "solar thermal facilities as small as 20 MW are currently proposed in California." DEIS at 2-33.

ii. Halting Construction Activities in Vicinity.

On approximately December 12, 2011, BLM notified CRIT that it had ordered NextEra to stop all construction activities on the Project site in the vicinity of the newly discovered cultural resources. BLM also indicated that it would continue to enforce this stop-work order until formal consultation had occurred. CRIT applauds these actions. However, a short-term work stoppage is only the beginning of the process. Subsequently, BLM engaged in consultation with CRIT Tribal Council, and indicated that consultation will continue, as the treatment alternatives and decisions are considered. CRIT likewise appreciates BLM's stated commitment to these goals.

iii. Review by Independent Expert.

CRIT believes that, for consultation to be meaningful, BLM and NextEra must allow CRIT to bring an expert to the site to investigate and analyze its significance. BLM must not allow NextEra to undertake any construction activities that could further disturb or degrade the site until CRIT's expert has had an opportunity to investigate the site. Please provide CRIT with a schedule of dates available for such a site visit, recognizing that CRIT's expert may need more than one day to conduct his/her research.

iv. The draft Trenching Plan Should be Revised, or Augmented to Include a Detailed Discussion of Avoidance Feasibility.

At the Dec. 6, 2011 meeting, and again during the January 12, 2012 meeting between the Bureau and its Tribal Council, CRIT made it clear to NextEra and to BLM that their first choice for treatment of the newly discovered cultural materials was through avoidance. Even though the proposed Trenching Plan states that it was "prepared . . . in consultation with . . . Native American tribal representatives," Plan at 1, the Plan fails to address what CRIT and other Tribes clearly and unanimously expressed was their preferred treatment option. Given that the PA, the HPTP, and the CEC conditions all state avoidance is the preferred method of handling unanticipated discoveries like those at the site, the Bureau must at the very least analyze the feasibility of avoiding these "unprecedented" finds.

v. Area of Critical Environmental Concern: "Land Swapping" Is Not a Viable Option

During the January 12, 2012 meeting between the Bureau and CRIT Tribal Council, the Bureau suggested that the Trenching Plan might yield information that could support a subsequent designation of lands around the GSEP site as an Area of Critical Environmental Concern ("ACEC"). Thus, while the Trenching and Grading would disturb the GSEP site, it may result in the future protection of neighboring BLM lands.

In response, CRIT Tribal Council members described the disturbance of cultural resources at the Genesis Solar Energy Project site as physically painful to them. One Tribal Council member, immediately grasping the implications of the Bureau's hypothesis, stated flatly, "We don't want to see lands swapped – the items being discovered there are too sacred to disturb."

Thus, the Colorado River Indian Tribes cannot, in good conscience, support trading the destruction of one cultural site for the possible protection of others. In addition, CRIT will be consulting with its own cultural resources expert/archaeologist about how, from a technical perspective, the Bureau can protect the resources at the site from disturbance while providing the information needed to support of a ACEC designation.

3. NAGPRA Does Not Require Excavation or Curation of Human Remains and Funerary Objects.

The discoveries at GSEP include a pair of nested metates lying upon a bed of charcoal. This is universally presumed to be a cremation site by members of the Colorado River Indian Tribes. They need not be shown a charred bone fragment, nor DNA analysis of ash samples to reach that conclusion. Avoidance of the site is CRIT's preferred treatment.

CRIT notes that nothing in the HPTP, or the Native American Graves Protection and Repatriation Act *requires* that the site be further disturbed by excavation, data-recovery or curation. No one at CRIT needs to know anything more than they already do to make this determination. Excavation, and curation are the last alternative that should be considered for protection of the gravesite elements – not the first.

Even if this *is* merely a chance grouping of elements, a coincidence of time, weather, and geologic processes, placing the two stone metates in a nested position atop the remnants of a domestic cooking or heating fire, there is still no compelling reason of which CRIT is aware, to unearth the site. Unless additional information establishing some compelling need to further disturb this site is provided, CRIT's treatment preference continues to be avoidance.

4. Supplemental EIS is Required.

At a minimum, given the extraordinary nature of the archaeological find at the Project site, BLM must prepare a Supplemental EIS for the Project, per 40 C.F.R. § 1502.9(c)(1)(ii), to address the "significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. As previously noted in communications with BLM, CRIT disagrees with the statement, contained in the minutes from the November 29 conference call, that: "George Kline indicated he talked to the tribes and they are ok with him keeping them informed regarding the plan and *no separate review would be required.*" Given that BLM did not contact CRIT until after this conference call—a fact acknowledged later in the same minutes—this statement is obviously inaccurate, at least as regards CRIT.

The HPTP itself supports such a review. Section 10.2 of the HPTP, entitled *Prehistoric Sites Associated With The PTNCL,* identifies Early Holocene discoveries at known sites in the same area as "exceedingly rare . . . making these discoveries quite significant." Section 10.2 goes on to state that the previous discoveries were made at CA-RIV-9047, CA-RIV-9072, and CA-RIV-9212., and that, like the current location of discoveries at GSEP, "[t]hese sites are all located along the north shoreline of Ford Dry Lake in sites that contain no ceramics or other diagnostic artifacts dating to periods later than the Archaic. This could possibly indicate a site complex . . . ." With such clear indication of the potential significance of these discoveries, the Tribes must demand that BLM consider avoidance of the area as its preferred treatment alternative. The Trenching Plan fails to address the avoidance option.

CRIT firmly believes that a Supplemental EIS, and not a Trenching Plan, is warranted here. The Trenching Plan assumes further disturbance is inevitable. CRIT does not support this assumption.

5. NextEra's Compliance with ROW Lease and CEC Conditions of Certification. Pursuant to its Right-of-Way Lease/Grant, NextEra was required to "*immediately* report[] to the Authorized Officer [at BLM]" "[a]ny cultural and/or paleontological resource (historic or prehistoric site or object) discovered by [NextEra], or any person working on its behalf." Right-of-Way Lease/Grant Serial Number CACA-048880, Exh. B, ¶ 4. NextEra was also required to "suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer." *Id.* CRIT is unaware whether NextEra complied with this condition, and whether BLM issued written authorization for NextEra to continue grading the site after such cultural resources were discovered. Please also provide us with any documentation related to NextEra's compliance with this provision (or lack thereof).

The Conditions of Certification imposed by the California Energy Commission also provide that, upon discovery of a cultural resource more than 50 years old, "ground disturbance shall be halted or redirected in the immediate vicinity of the discovery sufficient to ensure that the resource is protected from further impacts." CEC, Genesis Solar Energy Project, Commission Decision (September 2010) ("CEC Decision"), CUL-9. Ground disturbing activities cannot resume in the area unless and until a recommendation has been made on CRHR eligibility, all interested Tribes have been notified, and other steps have been taken—including the development of mitigation. Please advise us whether NextEra is in full compliance with this condition, and whether a CRHR eligibility determination has been made.

6. Security Measures

With the already large number of discovered cultural items increasing daily, CRIT is concerned that security measures to protect and preserve these irreplaceable items may be inadequate. The Tribes therefore request that NextEra be required to provide to each interested Tribe, a brief, but complete, confidential description of the cultural items located to date, whether these items have been removed from the site, where any removed items are presently located, and how those items, and the worksite are being secured.

7. Observations Regarding "Fast-Tracking" of Project Applications

The Tribe recognizes that modern public policy favors the development of renewable energy resources, deeming such development a benefit to society as a whole. Consequently, pursuant to federal policy, numerous project proposals have been, or are currently being "fast-tracked" through the regulatory approval process, toward ultimate development.

The fast-tracking approach has resulted in short reviews, poor consultation practice, and needless conflict, causing all concerned undue hardship, and failing to adequately protect invaluable, irreplaceable resources of many varieties. With so many project proposals to monitor, and the flood of new project applications overwhelming the staff of BLM Field Offices all over the region, CRIT feels it must be proactive in the protection and oversight of cultural resources in the area.

In principle, CRIT, like many Tribes, favors renewable energy development.[1] However, the problems sought to be remedied by large-scale renewable energy projects largely are an outgrowth of human activities in concentrated urban-industrial population centers coupled with our current dependence on fossil fuels. Historically, isolated and often remote Tribal communities contribute only minimally to these problems. CRIT appreciates the potential value of a streamlined project approval process – increased economic efficiency for both federal agencies and developers, increased energy resources, reduced greenhouse gas emissions, enhanced energy independence – yet, the recent flood of GSEP discoveries makes a strong counterargument for amending the process to better protect cultural resources that are "non-renewable and irreplaceable, a part of our national heritage." [2] The Tribe believes that needless disturbance of significant cultural resources has occurred at the Genesis site, and that these unfortunate outcomes are likely to occur again and again if the "fast-track" protocols remain in effect. CRIT's concerns are aptly characterized in testimony given by Dr. Elizabeth Bagwell, CEC's staff Project Archaeologist, at the Evidentiary Hearing Before The California Energy Resources Conservation And Development Commission, during the Application for Certification Proceedings. Dr. Bagwell stated as follows:

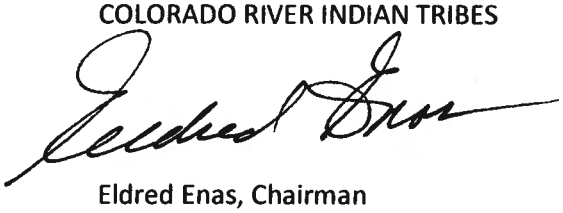
[C]ultural resources are a non-renewable resource. Unlike biology, where you can repair the environment to a certain degree and encourage plants and animals to return. Once you've destroyed cultural resources, they're gone forever.

Bagwell, Elizabeth, Ph.D. Transcript, CEC, Pg. 147

CRIT shares Dr. Bagwell's concerns. The potential for adverse impacts to this "non-renewable resource" is clear, and "[o]nce you've destroyed cultural resources, they're gone forever."

Thank you for this opportunity to comment on the proposed Trenching Plan. CRIT remains ready to discuss these issues with the Bureau, NextEra and other affected parties so that we may reach agreement on an acceptable and respectful way to handle this new discovery.

Very truly yours,
COLORADO RIVER INDIAN TRIBES



Eldred Enas, Chairman

cc: Tribal Council
Ken Salazar, Secretary of the Interior
Larry Echo Hawk, Assistant Secretary of Indian Affairs, DOI

---

[1] Letter from Mike Jackson, Sr., President, Quechan Indian Tribe, to John Kalish, Field Manager, BLM Palm Springs Field Office. (February 16, 2010) (Retrieved from: http://www.energy.ca.gov/sitingcases/genesis_solar/documents/others/2010-02-16_Section_106_Consultation_Process_Letter_TN-55835.pdf. (January 20, 2012)

[2] Electronic Mail from Greg Glassco, Yavapai-Prescott Indian Tribes, Cultural Resources Manager to Douglas F. Bonamici. Law Clerk, Colorado River Indian Tribes (January 19, 2012, 4:02 pm MST) (on file with author).

cc: Tribal Council
Ken Salazar, Secretary of the Interior
Larry Echo Hawk, Assistant Secretary of Indian Affairs, DOI
Bob Abbey, Director, Bureau of Land Management
James G. Kenna, California State Director, BLM
Teri Raml, District Manager- California Desert District, BLM
Janice Staudte, Superintendent, Colorado River Agency, BIA
George Klein, Archaeologist, South Coast Field Office, BLM
Eric N. Shepard, Attorney General
Lisa Swick, Acting Museum Director
Ron Escobar, Tribal Secretary/ Treasurer, Chemehuevi Tribe
Linda Otero, Tribal Council, Fort Mojave Indian Tribe
Patricia Garcia-Tuck, Director, THPO Agua Caliente Band of Cahuilla Indians
John P. Bathke, Historic Preservation Officer, Quechan Indian Nation
H. Jill McCormick, M.A., Cultural Resources Manager, Cocopah Indian Tribe
Winter King, Shute, Mihaly & Weinberger LLP

Thank you for your comment, Patrick Maguire.

The comment tracking number that has been assigned to your comment is SEDDsupp20123.

Comment Date: January 27, 2012 14:52:34PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20123

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Address 3:
City: Santa Monica
State: CA
Zip: 90401
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Dixieland PEIS Variance Request.pdf

Comment Submitted:

MAINSTREAM
RENEWABLE
POWER

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www.mainstreamrp.com

January 25, 2012

Solar Energy Draft PEIS
Argonne National Laboratory
9700 South Cass Avenue
EVS/240
Argonne, IL 60439

Comments on the Supplement to the Draft Solar PEIS

Dear Agencies:

Mainstream Renewable Power ("Mainstream") is a developer of renewable onshore and offshore solar and wind energy projects. Mainstream currently has operations in eight countries on four continents with over 8,500 MW under development. In California, this development includes two major wind energy projects on Bureau of Land Management ("BLM") managed lands. California represents a strategic and important focus for Mainstream's development portfolio.

Mainstream also supports the efforts of the Department of Energy ("DOE"), the BLM and all the co-operating agencies in supporting the goal for the responsible development of renewable energy in the western United States. Mainstream shares this objective through sensible siting and conscientious development.

When reviewing any development proposal, Mainstream takes great care in identifying and analyzing prospective site characteristics. When reviewing potential solar sites, Mainstream evaluates its compatibility with surrounding land uses and whether residual impacts to the environment are minimized. After much detailed analysis, Mainstream believes that it has found such a potential solar development site. This site is unique in that it retains excellent solar resources, has apparently minimal environmental impacts, is on land largely previous disturbed, is adjacent to transmission rights-of-way, substations and other solar developments, and has no other apparent public use.

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We have reviewed the proposed Solar Development Area Maps and find that this excellent potential solar development site has not yet been specifically identified. The site is; however, in the vicinity of the Imperial East Proposed Solar Energy Zone. The characteristics of the proposed solar development site are as follows:

- Project Name – Dixieland Solar Project
- BLM Ref – CACA053143
- Land Owner – United States Department of the Interior, managed by the BLM
- Acreage – 240 acres
- Location – County of Imperial, California (13 miles west of the City of El Centro)
- Address – North of Strobel Road, south of Evan Hewes Highway and west of the Foxglove Canal and Dixie Drain No.4
- Section – T16S R11E, Sec. 11 & 12 and T16S R12E, Sec. 18
- APN's – 034360074000, 51260018000, 034360040000
- Map – See enclosed

Mainstream appreciates that given the smaller project acreage, this site would not be suitable as an independent Solar Energy Zone; however, we believe that the proposed site is an excellent candidate to be included as a variance area.

Prior to such review, it must be noted that the Dixieland application to the BLM was submitted in May 2011, the first application screening meeting took place on May 20th 2011 and the second on August 4th 2011, all prior to the publication of the Supplement to the PEIS. In your Answer to Questions section, you define "pending applications" as applications on file with the BLM before publication of the Supplement, including applications for lands within proposed SEZs filed before June 30, 2009. "New" applications are those applications filed within proposed SEZs after June 30, 2009, and any application filed after the publication of the Supplement. The application was processed in accordance with applicable BLM instructional memorandums and the application was formally accepted by the BLM Field Office at El Centro on October 7, 2011. Since the application was received and "on file" prior to the publication of the supplement, it should be considered a pending application; however, further clarification may be necessary.

In addition to being an "application on file", Mainstream requests that the Dixieland Project site be included as a variance area in the proposed Solar PEIS. Additional supporting factors include:

- The surrounding area is a hub for existing and permitted solar and geothermal electricity generation
    - Imperial Irrigation District ("IID") Dixieland Substation is one mile north
    - IID's proposed 230kV Transmission Line crosses the Dixieland Project site boundary (anticipated construction date of 2012/13)
    - SDG&E Imperial Valley Substation is located approximately six miles southeast of the project site
    - Union Pacific Railroad tracks share the northern site boundary
    - Foxglove Canal and Dixie Drain No. 4 share the eastern site boundary
    - The existing Southwest Powerlink and proposed Sunrise Powerlink are located approximately three miles south of the project site
    - BLM Classification – Limited with Type III Application accepted

- There are at least two other major solar projects planned on adjacent lands
    - Centinela Solar Project, south and west of the Dixieland site
    - Imperial Valley Solar Project, west of the Dixieland site

- In order to accommodate the flexibility described in the program objectives, the modified program alternative allows for utility-scale development in variance areas outside of the Solar Energy Zones and exclusion areas in accordance with a proposed variance ordinance. As the draft Solar PEIS document indicates, there are twenty-nine categories of lands that would be excluded from solar development. None of these categories are found at the proposed Dixieland Solar Project site. Moreover, the site is:
    - Project to accommodate a PV Array system of approximately 20MW total.
    - Site is not within the BLM-administered lands considered off-limits to development. Rather the site has been serialized by BLM as CACA053143
    - Lands have a slight east slope of approximately 1%
    - Solar isolation levels are greater than 7.0 kWh/m2/day
    - The Dixieland site is not in or adjacent to designated critical habitat, special management areas, wilderness study areas or Areas of Critical Environmental Concern (ACECs)
    - Preliminary biological assessments indicates that the site has no apparent critical habitat for any threatened or endangered species

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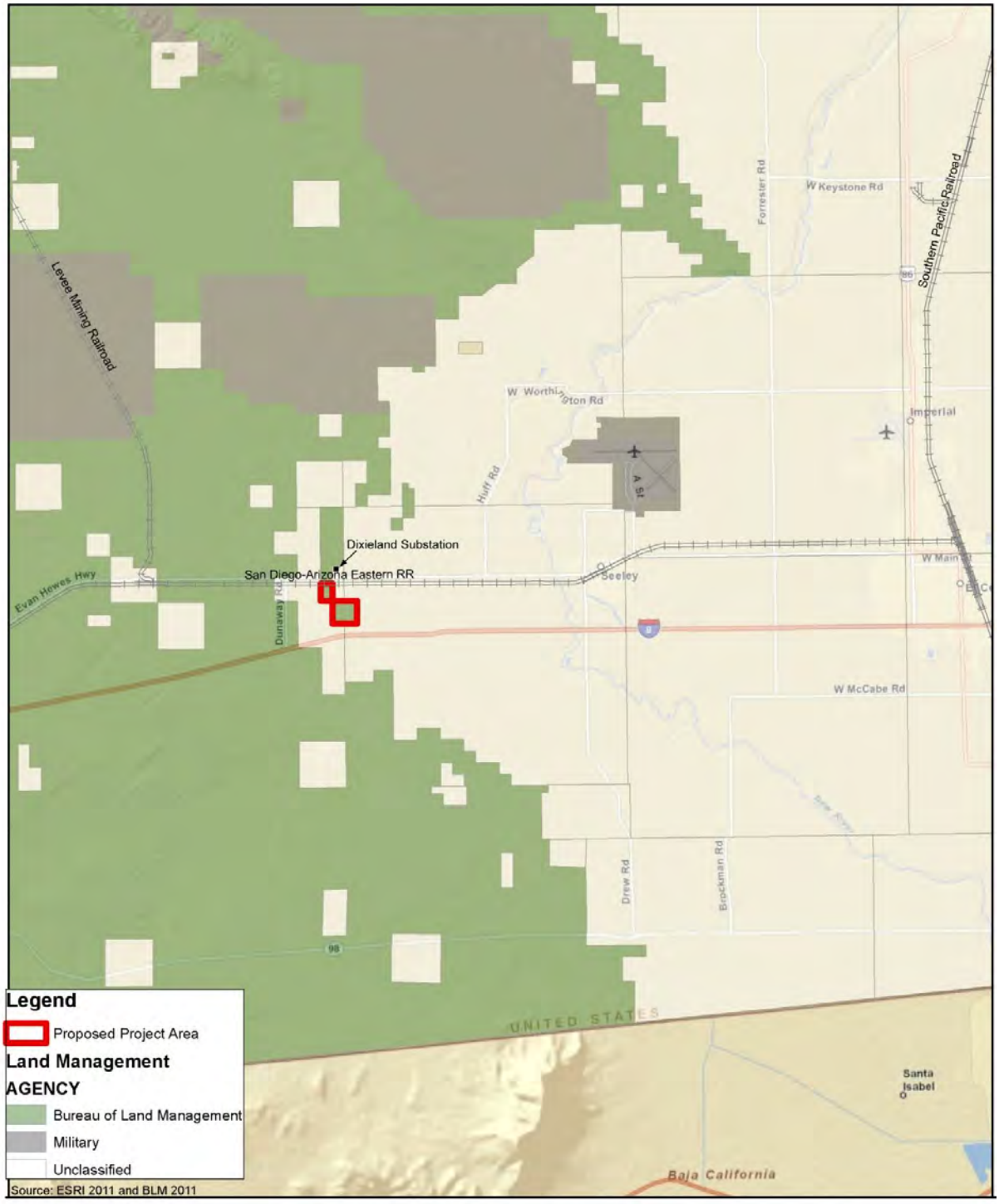
- The site is not a right-of-way exclusion areas or avoidance area
- The site is not a special recreational management area or other special use area
- Although not required for PV array installation, the site is adjacent to water supplies

According to the map published by the Argonne National Laboratory, dated October 2011, titled "BLM-Administered Lands in California Available for Application for Solar Energy ROW Authorizations under the Modified BLM Alternatives Considered in the Supplement", the Dixieland Project site appears not to have been included in Lands Available for Application – Modified Program Alternative (Variance Areas). For all the reasons stated above, including that the project application has already been accepted by the BLM, Mainstream believes the proposed PEIS can be enhanced with the inclusion of this Dixieland Project site.

We appreciate the opportunity to comment of the proposed Solar PEIS and are available at any time to discuss further the recommendations included in this transmittal. Should you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Patrick Maguire
Vice President Development


Legend
Proposed Project Area
Land Management
AGENCY
Bureau of Land Management
Military
Unclassified
Source: ESRI 2011 and BLM 2011
Dixieland Substation
San Diego-Arizona Eastern RR
Levee Mining Railroad
Southern Pacific Railroad
Forrester Rd
W Keystone Rd
W Worthington Rd
Imperial
Huff Rd
A St
Evan Hewes Hwy
Dunaway Rd
Seeley
W Main St
W McCabe Rd
Drew Rd
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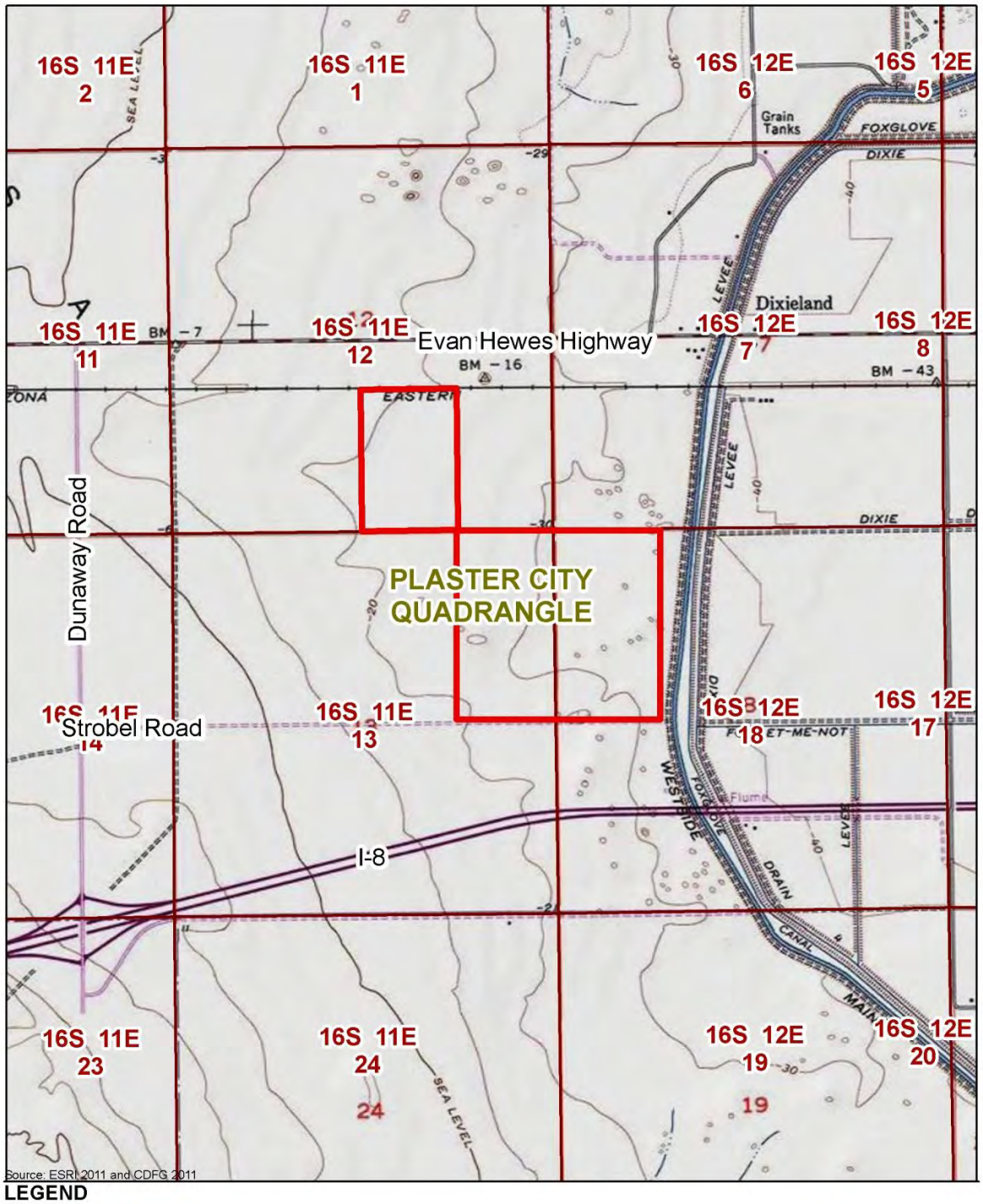

Source: ESRI 2011 and CDFG 2011

LEGEND

Proposed Project Area

0 0.125 0.25 0.5 0.75 1 Miles

RMT
ENVIRONMENT • ENERGY • ENGINEERING

Figure 4: Panoramic Views of the Project Site

Northern Project Parcel

Southern Project Parcel

Figure 5: Panoramic Views of the Project Site

Dixie Drain #4, Looking South with Southern Parcel on Right with Berm

Union Pacific Railroad on Northern Boundary of North Project Parcel

Thank you for your comment, Gary Werner.

The comment tracking number that has been assigned to your comment is SEDDsupp20124.

Comment Date: January 27, 2012 15:23:33PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20124

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Attachment: PEIS_-Supplement_-_PNTS_Comments_-27Jan2012.pdf

Comment Submitted:

Partnership for the National Trails System

222 S. Hamilton #13 Madison, WI 53703 Phone: (608) 249-7870
www.pnts.org Fax: (608) 257-3513

Sustaining Our Trail Resouces

January 27, 2012

VIA ELECTRONIC SUBMISSION (http://solareis.anl.gov/involve/comments/index.cfm)

Linda J. Resseguie
Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue
EVS/240
Argonne, IL 60439

Re: Comments on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (DOE/EIS-0403D-S

Dear Ms. Resseguie:

The Partnership for the National Trails System (PNTS) commends the efforts of the Bureau of Land Management (BLM) to respond to the many public comments on its draft solar programmatic environmental impact statement (Draft PEIS) by drafting a generally strong Supplement, which elevates protections for natural and cultural resources. We are pleased to see the withdrawal from consideration, or the substantial reduction of, several proposed solar energy zones (SEZs) which, if developed, would have impacted significant natural and cultural resources. We also commend the BLM for conducting thorough National Environmental Policy Act reviews of SEZs, requiring Class II or III cultural resource inventories of project areas proposed in variance applications, and requiring consultation under the National Historic Preservation Act as part of the analysis of new SEZs. Our comments on the Supplement focus on what we see as still inadequate protections for current and potential units of the National Trails System.

We believe, as many others do, that all federal agencies, including the BLM, should work with other public and private entities to achieve significant reduction of energy use through greatly improved efficiency and conservation as a top national priority. Stabilization and reduction of energy use by government, corporations, and individuals -- as has been achieved in California for 30 years -- should be done before embarking on building vast new energy production systems on public lands. We also believe that BLM should play a role, with other federal agencies, in promoting and facilitating "distributed energy production" – the generation of energy through local technologies close to where the energy is used – rather than relying solely on large-scale energy production and transmission systems. Energy policy should seek the elegance of minimizing rather than maximizing energy use; should seek to conserve rather than to expend resources as a first operating principle.

Interests of the Partnership

The Partnership for the National Trails System is a tax-exempt, non-profit federation of 34 non-profit organizations that work in direct partnership with Federal and state agencies to help sustain and manage America's 30 national scenic and historic trails. The Partnership exists to foster information exchange among the trail organizations, to provide skill-building training for volunteers and staff, to coordinate their public policy advocacy, and to advise Federal agency managers about issues relating to the National Trails System.

The Partnership was incorporated in 2001 and received tax-exempt 501(c)3 status from the Internal Revenue Service in 2003.

I. BLM should treat national scenic and historic trails as equal units of the National Landscape Conservation System.

We strongly applaud and support the decision to exclude all units of the National Landscape Conservation System (NLCS), including the national scenic and historic trails, from areas to be considered for solar energy development. Despite this decision the national scenic and historic trails are inadequately protected in the draft Solar PEIS.

When Congress designated the **National Landscape Conservation System** (Conservation System) it explicitly recognized that the system shall include each area that is "designated as a national scenic trail or national historic trail designated as a component of the National Trails System" 16 U.S.C. § 7202(b)(1)(D). Additionally, the Supplement acknowledges that national scenic and historic trails (NSHTs) are units of the Conservation System [Supplement at 1-10] and BLM Instruction Memorandum (IM) 2011-061 states that solar "development must… be consistent with protection of areas and resources of national interest, including the BLM National Landscape Conservation System." However, at the same time, the Supplement and the IM propose to lessen protections for NSHTs relative to other components of the Conservation System, a prescription we find inconsistent with Congress' intent. For instance, while both documents consider other units of the Conservation System to be areas of "High Potential for Conflict," they consider NSHTs to be areas of only "Medium Potential for Conflict" because of their "linear nature" [Supplement at I-10] and the idea that they "have resource conflicts that can potentially be resolved" [IM].

Recommendation:

- While the origin of this discrepancy between NSHTs and other units of the Conservation System is not the Supplement itself, we recommend that the BLM remedy this inconsistency in the treatment of units in the Supplement by elevating high potential route segments of national historic trails (NHTs) and national scenic trails (NSTs) to "High Potential for Conflict."

II. BLM should increase the width of the avoidance area for national scenic and historic trails.

The Supplement states that the standard avoidance width for NSHTs is 0.25 miles, except where a corridor of a different width has been established [Supplement at 2-16]. We commend BLM on establishing a minimum avoidance corridor for NSHTs, but given the importance of their landscape setting for the integrity and significance of NSHTs, and the dramatic visual impacts that utility scale solar developments have on resources that surround them, we believe BLM should add protections for trails beyond that narrow corridor. Such protections should be commensurate with the most

up-to-date strategies for protecting NSHTs, such as those included in the draft environmental impact statement/resource management plan (Draft EIS/RMP) revision recently published by the Lander Field Office of the BLM in Wyoming. For example, the preferred alternative in the Draft EIS/RMP prescribes specific physical and visual protections for trails at 0.25 mile, 1 mile, 3 miles, 5 miles, and more than 5 miles, depending on the development activity.

Recommendations:

- Using BLM's Visual Resource Management System, protections for NSHTs against impacts from utility scale solar energy development should include, at a minimum, limitation of visual contrasts to "weak contrast" for national scenic trails and for high potential route segments of national historic trails.
- BLM should consistently require mitigation measures that reduce visual impacts to current and potential (e.g., West Fork of the Old Spanish National Historic Trail) NSHTs. Such measures could include imposing limits on the height of power poles, promoting non-penetrating and low profile racking/panel photovoltaic systems, and, where appropriate, using low visibility fencing, such as black fencing in lieu of uncoated galvanized fencing, and golf netting.
- Because transmission lines servicing the solar installations can also cause direct and indirect impacts to trails, BLM should require applicants to align power poles within existing easements and rights-of-way for existing power lines, where feasible.
- Where applicable, BLM should require developers to explore agreements with adjacent landowners to eliminate transmission line crossing of public lands in locations where they could directly or indirectly impact national scenic trails and high potential route segments of national historic trails.

III. BLM should consider modifying additional SEZs to reduce impacts to NHTs.

As mentioned above, we commend BLM for removing or modifying several proposed SEZs to reduce impacts to significant resources. However, we believe that BLM should re-examine the extent of adverse impacts of some remaining SEZs to NHTs, given the NHTs' national significance and inclusion in the Conservation System, and modify those SEZs accordingly.

Recommendations:

We recommend that BLM modify the following SEZs to reduce impacts to national historic trails:

- *De Tilla Gulch*: We commend BLM for suggesting inventory and viewshed analysis to help determine potential impacts to the Old Spanish NHT and the West Fork of the Old Spanish Trail from this SEZ. Yet, we feel that the strong visual impacts to the trails that are guaranteed within approximately 5 miles of the SEZ remain unacceptable. Therefore, we recommend that BLM push, at a minimum, the southeastern boundaries of the SEZ back at least 2.5 miles, as well as implement strong mitigation measures to further reduce visual impacts.
- *Dry Lake:* We commend BLM for dramatically reducing the size of this proposed SEZ, in part to avoid impacts to significant cultural resources. However, we still recommend that BLM move the southeastern boundary of the SEZ to the west of I-15 to help reduce impacts to the Old Spanish Trail/Mormon Road site, which is listed in the National Register as a district.

IV. BLM should conduct a Class II cultural resources inventory of at least 10% of each currently proposed SEZ.

We strongly support BLM's recommendation for the use of Class II sample surveys to better understand cultural resources located within proposed SEZs. However, we feel that 5% minimum survey coverage, as planned for SEZs in Arizona, California, and Nevada [Supplement at 2-22] is inadequate. This inadequacy is illustrated by the fact that data collection efforts recommended to reduce uncertainty about potential impacts from several of the proposed SEZs (e.g., Brenda, Gillespie, Imperial East, Riverside East, Antonito Southeast, De Tilla Gulch, Dry Lake Valley North, Gold Point) involve acquiring a 10% sample of each SEZ [Supplement at C-19, C-36, C-51, C-77, C-96, C-112, C-203, C-218].

Recommendations:

- BLM should require consistent Class II sampling of, at a minimum, 10% of current SEZs. This information should be used to help guide solar development away from areas of significant cultural resources and/or to enact avoidance and mitigation strategies.
- BLM should require consistent Class II sampling of, at a minimum, 20% of future proposed SEZs to help ensure avoidance of areas of significant cultural resources. This increased percentage of inventory should be feasible with future funding allocations and longer planning time, and it will provide a more accurate model of the probable locations of significant cultural resources.

Conclusion

When planning for large-scale solar energy development on federal public lands, the BLM must consistently prioritize the protection of outstanding natural, historic, and cultural resources, including—but not limited to—significant concentrations of prehistoric and historic archaeological sites, national scenic and historic trails, and Native American traditional cultural properties and sacred sites.

We appreciate the opportunity to provide these comments and we look forward to participating further in the PEIS process. Please contact me at (608) 249-7870 with any questions or concerns regarding these comments.

Sincerely,

Executive Director
Partnership for the National Trails System

Thank you for your comment, Kathleen Zimmerman.

The comment tracking number that has been assigned to your comment is SEDDsupp20125.

Comment Date: January 27, 2012 15:24:35PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20125

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Privacy Preference: Don't withhold name or address from public record
Attachment: NWF comments on Solar DPEIS Supplement FINAL.pdf

Comment Submitted:

NATIONAL WILDLIFE FEDERATION

Rocky Mountain Regional Center
2995 Baseline Road, Suite 300 Boulder, CO 80303 www.nwf.org

January 27, 2012

Draft Solar Energy Programmatic EIS
Argonne National Laboratory
9700 South Cass Avenue -- EVS/240
Argonne, Illinois 60439

Delivered via electronic and regular mail

Re: Comments on the Supplement to the DRAFT Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

To Whom It May Concern:

These comments are submitted on behalf of the National Wildlife Federation (NWF). NWF appreciates the opportunity to submit these comments to the Department of Energy and the Bureau of Land Management [hereinafter Agencies]. NWF is submitting these comments today via electronic mail and forwarding a copy separately by mail.

As an organization, NWF represents the power and commitment of four million members and supporters joined by affiliated organizations in 48 states and territories and the District of Columbia. NWF and its affiliates have a long history of working to conserve the wildlife and wild places in the West. Many members of NWF and its affiliates use the lands and resources that will be impacted by utility-scale solar energy generation facilities constructed on federal public lands; they also use and enjoy wildlife resources that may be impacted by construction of these facilities on other federal lands, as well as state, private and tribal lands.

NWF also recognizes that climate change poses an enormous threat to both the human environment and the earth's biologic diversity. For that reason, NWF has called for a rapid transition to energy sources other than fossil fuels that contribute to greenhouse gas (GHG) emissions and climate change. The generation of electricity via solar energy, including utility-scale facilities, is an important component of that transition. Without immediate and decisive steps to curb GHG emissions, the long-term survival of many wildlife species is in jeopardy.

INTRODUCTION

NWF supports the Agencies' decision to supplement the *Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States* [hereinafter DPEIS] released last year. The Supplement clearly reflects a willingness to respond to comments submitted by both conservationists and industry proponents. It also demonstrates the complexity of both promoting such a land-intensive use and conserving vital fish and wildlife habitats. NWF believes the Agencies truly are committed to developing a strategy for siting utility-scale solar energy generation facilities that meets both of those goals.

As NWF stated in its comments on the DPEIS, NWF wholeheartedly endorses the designation of Solar Energy Zones (SEZs). The SEZs represent a new approach on the part of BLM, one where the agency more fully exercises its authority to promote and manage commercial activities on public lands. NWF believes that this approach will avoid the fragmentation of important wildlife habitats that has occurred as a result of other commercial activities on public lands, such as oil and gas drilling. The concentration of development in the SEZs promotes the consolidation of related infrastructure (e.g., roads, transmission lines) resulting in less total land disturbance and reduced costs to both industry and consumers. NWF also believes that this approach will increase support for renewable energy projects by reducing opposition from other public land users.

NWF is happy to see that the Supplement modifies the BLM's preferred alternative as identified in the DPEIS in several respects. The Supplement proposes to:

1) eliminate from consideration several SEZs that were unacceptable either because of potential impacts on environmental resources, including fish and wildlife, or because the SEZs were unworkable for industry;
2) re-configure several SEZs in order to avoid conflicts with environmental resources;
3) clarify incentives for projects constructed within SEZs;
4) expand the categories of environmental resources that would be protected from solar energy development;
5) require BLM to conduct site-specific environmental impact analyses when individual locations and proposed uses are identified;
6) improve consultation with Tribes; and
7) commit BLM to the preparation of regional mitigation plans to compensate for the unavoidable loss of some public lands resources.

In its comments on the DPEIS, NWF also urged BLM to abandon the provisions of the preferred alternative which made 22 million acres of public land available for utility-scale solar energy generation facilities outside the SEZs. The Supplement does modify the methodology by which lands outside designated SEZs would be made available to development. Developers seeking to site projects outside SEZs would be required to seek a "variance." Alternatively, the Supplement identifies criteria for the designation of additional SEZs. So, the Supplement no longer states that 22 million acres of public land

will be openly available to the construction of utility-scale solar energy generation facilities. However, counting the lands where either variances may be granted or new SEZs designated, there is still 18-20 million acres of public land "on the table."

NWF remains concerned that the variance process as outlined in the Supplement is not restrictive enough to preserve the integrity of the SEZs. The SEZs are intended to prevent a hodge-podge of projects and transmission lines across the landscape. The variance process could undermine that goal. Instead of sorting through requests for variances, NWF urges BLM to devote its limited resources to the ongoing processes in California, Arizona, Colorado, and Utah to designate additional SEZs.

SPECIFIC COMMENTS

The Variance Process

NWF understands the appeal of providing sufficient flexibility to accommodate the "perfect" project even though it would be constructed outside an SEZ. Unfortunately, the variance process as currently proposed does not limit its reach to utility-scale solar energy generation facilities proposed for "perfect" sites on already-disturbed lands with little or no fish and wildlife values but with ready access to transmission and plentiful water. The variance process merely states that BLM will "consider" a number of factors when evaluating variance applications. Those factors include "[d]ocumentation that the project will be located in an area with low resource values and where minimal conflict with adjacent lands is likely." However, nothing in the variance process described in the Supplement specifically prohibits BLM, after due consideration, from granting a variance for a solar farm next to a backcountry trout stream, a project that might require the construction of miles of transmission and roads through valuable fish and wildlife habitat. Industry proponents have assured NWF that they have no interest in seeking variances for such locations. So, there would be little harm in clarifying that variances will only be granted for projects that can be brought online quickly, where the applicant has sufficient capital and access to markets, and the project will have very limited effects on other public lands resources because the resources already are significantly and permanently impacted by other human activities and infrastructure at or near the site.

The Competitive Process

NWF supports BLM's commitment to establish a competitive bidding structure for rights-of-way on public lands to construct utility-scale solar energy generation facilities. BLM is obligated to secure fair market value for the use of public resources. However, the competitive bidding process for access to lands within the SEZs must not become a deterrent to development within the SEZs. NWF urges BLM to develop a competitive bidding system that is extremely "user-friendly." BLM might also consider a bidding structure where cash bonuses or other bid components could be paid out over time so that the successful bidder could devote more financial capital initially to designing and building out the projects.

Mitigation
The Supplement states that "regional mitigation plans" will be developed for each SEZ (Supplement at 2-24), but contains little information about what these mitigation plans will include. While NWF recognizes the difficulty of developing comprehensive mitigation plans in the context of a programmatic document, it would be useful to establish some criteria for the content of these plans.

Due to the nature of utility-scale solar energy generation facilities, the efficacy of mitigation measures is severely limited (*see* DPEIS Table 5-10-2 at 5-95). The only truly effective mitigation will be to close lands to this development. Little can be done on-site except to reclaim those resources disturbed during construction – roads and staging areas that are no longer necessary once the facility is up and running. Regional mitigation plans will most likely have to address off-site mitigation.

NWF believes that no off-site mitigation proposal should be accepted without a thorough assessment of: the availability of other habitat, the feasibility of long-term restoration/enhancement/protection of alternative habitat, and the adequacy of funding to sustain the alternative habitat for the life of the project (including time required for final reclamation standards to be achieved). NWF has seen too many examples where industry has offered to "throw some money" at the problem without any analysis of the extent of the wildlife impacts or the availability of effective mitigation remedies.

NWF is heartened to see that BLM intends to ensure that any mitigation lands are protected to provide enduring conservation benefits and that as part of its environmental review of future projects, BLM will evaluate the success of its previous mitigation efforts. However, BLM should also make clear that risk of mitigation failure must not be borne entirely by fish and wildlife. BLM should state that all regional mitigation plans will establish binding thresholds for fish and wildlife losses; that reaching the thresholds will have consequences for both new and existing projects; and that lack of monitoring data is not an excuse to continue existing projects and authorize new ones.

Tribal Consultation
The Supplement states that:

> Processes under way will build upon government-to-government consultation undertaken between the BLM and Indian Tribes regarding the Draft Solar PEIS. The BLM ***expects*** these actions will continue through completion of the Solar PEIS, signing of the ROD, and beyond, as the agency considers project-specific solar applications to be reviewed under the policies 18 established by the national solar program.

Supplement at 2-82, *emphasis added.* Government-to-government consultation is an obligation mandated by both statute and treaty. Rather than "expect" consultation to continue, BLM is obligated to "ensure" consultation continues.

BLM conducted an ethnographic study for the SEZs located in Nevada and Utah, including information related to traditional uses of plants and animals, trails, and sacred

sites, to enable BLM to minimize impacts on cultural resources. Prior to the preparation of the Final Solar PEIS, BLM states it will contact other tribes not included in the study to ensure the inclusion of tribal traditional uses and cultural resources in other SEZs in other states (Supplement at 2-82). NWF urges BLM to pursue and fulfill fully this objective.

BLM acknowledges that individual SEZ action plans contain data gaps, stating:

> The BLM will prioritize the collection of additional data and analysis in those SEZs that are most likely to be developed in the near future. Some of the items identified in the action plans will be completed by the BLM and presented in the Final Solar PEIS. Data collection not completed by the BLM (as part of the Final Solar PEIS or through other efforts) would likely be required of developers as part of site-specific tiered analysis for future projects.

Supplement at C-1. Appendix C also indicates that substantial data gaps exist in regards to cultural resources and cultural inventory assessments for the SEZs. BLM is obligated to ensure these inventories are conducted for site-specific projects and that government-to-government consultation with tribes is carried out. Consultation and cultural resource assessments should aim to avoid, or at the very least minimize, the impacts of solar projects to cultural resources.

Designated SEZs

In its comments on the DPEIS, NWF pointed out that several of the SEZs identified in the DPEIS included vital habitats for Greater sage-grouse and big game species. These observations were based upon GIS data supplied by state wildlife agencies. While a couple of these SEZs have been modified and no longer include these habitats, there are several that remain of concern to NWF.

De Tilla Gulch SEZ in Colorado, as originally proposed in the DPEIS, contains both elk severe winter range and pronghorn winter concentration areas (Supplement at C-101). The Supplement states that pronghorn seasonal ranges have been excluded but does not address the severe winter range for elk (*Id.* at C-102).

The Gold Point SEZ in Nevada contains habitat for the Greater sage-grouse. The Supplement states that "pre-disturbance surveys" will be conducted within this SEZ for sensitive species, including sage-grouse, (Supplement at C-211 to C-214) and that "suitable" habitats will be mapped. The Supplement does not indicate that these habitats will be excluded from development. The same is true of the Milford Flats South SEZ in Utah where the SEZ includes sage-grouse habitat and the proposed transmission corridor would cross brood-rearing habitat. The Wah Wah Valley SEZ in Utah still includes significant sage-grouse habitat.

Several of the proposed SEZs include lands that provide movement corridors for Desert bighorn sheep.[1] BLM acknowledges this important wildlife use; yet, with the exception of suggested limits on fencing, nothing in the SEZ-Specific Design Features for SEZs includes measures to ensure these routes retain their value as movement corridors. BLM must identify these corridors and commit to effective conservation measures. For all SEZs, requiring that migratory bottlenecks are not created within these corridors both on and off the SEZs should be part of the program components described in the DPEIS in Appendix A and in Specific Design Features.

CONCLUSION

As an organization, NWF wants the SEZ strategy for development on public lands to succeed. To be successful, NWF recognizes that the SEZs must work not just for conservation of fish and wildlife habitat but also for industry proponents and for BLM itself. Once the DPEIS is finalized NWF urges BLM to continue to collect site-specific information regarding resources at risk and potential impacts so that processing applications for projects within SEZs can be as streamlined as possible. The collection of this data can also help inform the designation of additional SEZs. NWF supports BLM's decision to focus some attention on the transmission issues associated with getting solar power onto the grid. Transmission access could be a serious roadblock to the viability of the SEZs and to individual projects. Both the collection of additional information on impacts and the availability of transmission will make the SEZs more workable for industry proponents.

NWF also urges BLM to tighten the variance process so that there remain adequate incentives to drive development to the SEZs and conserve other important public lands resources. Otherwise, fish and wildlife habitat will continue to be "nickel and dimed" away. This is bad for fish and wildlife and for the agency. BLM will continue to have to respond to applications seeking variances across the landscape instead of concentrating its limited resources on permitting projects inside the SEZs. Given that the SEZs identified in the Supplement provide more acreage than is necessary to meet projected demand, it makes no sense for BLM to waste time reviewing applications for projects that are both unwise and unnecessary.

Sincerely,

Kathleen C. Zimmerman
Senior Policy Advisor, Public Lands Program
National Wildlife Federation

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[1] *See, e.g.*, Dry Lake Valley North SEZ in Nevada (Supplement at C-198); Gold Point SEZ in Nevada (Supplement at C-213); Millers SEZ in Nevada (Supplement at C-232); Afton SEZ in New Mexico (Supplement at C-251).

Thank you for your comment, Rob Mrowka.

The comment tracking number that has been assigned to your comment is SEDDsupp20126.

Comment Date: January 27, 2012 15:33:25PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20126

First Name: Rob
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Attachment: CBD comments on the supplement to the Solar PDEIS - final.pdf

Comment Submitted:

I am submitting a 10-page letter and two attachments via the uploader contained on this page.

CENTER for BIOLOGICAL DIVERSITY Because life is good.

Shannon Stewart, BLM Solar PEIS Project Lead
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Argonne National Laboratory
9700 S. Cass Avenue
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Argonne, IL 60439

January 27, 2012

Electronically via: http://www.solareis.anl.gov/involve/comments/index.cfm

Subject: Center for Biological Diversity Comments on the Supplement to the Draft Solar PEIS

Dear Ms. Stewart:

Please accept and fully consider these comments on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States ("Supplement") on behalf of The Center for Biological Diversity ("Center"). To avoid repetition, we incorporate by reference our previous comments submitted for Nevada via a Wilderness Society letter dated April 18, 2011 and for California our organizational letter dated May 2, 2011.

The Center is a not for profit international conservation organization dedicated to working through environmental advocacy, science, law and creative media to secure a future for all species, great or small, hovering on the brink of extinction. The development of renewable energy is a critical component of efforts to reduce greenhouse gas emissions, avoid the worst consequences of global warming, to comply with legislation and Executive Orders and to assist California and Nevada in meeting legislative mandates for emission reductions. The Center strongly supports the development of renewable energy production, and the generation of electricity from solar power, in particular. However, like any project, solar power projects should be thoughtfully planned to minimize impacts to the environment. In particular, renewable energy projects should avoid impacts to sensitive species and habitats, and should be sited in proximity to the areas of electricity end-use in order to reduce the need for extensive new transmission corridors and lines and the efficiency loss associated with extended energy transmission. Only by maintaining the highest environmental standards with regard to local impacts, and effects on species and habitat, can renewable energy production be truly sustainable.

The Center wishes to acknowledge the affirmative response the Bureau of Land Management ("BLM") and Department of Energy ("DOE") have made in the supplement in response to comments we and others submitted to the draft environmental impact statement ("DEIS"). By doing so, you strengthen our commitment to working with you in the planning and development of a viable renewable energy program on the federal public lands.

The BLM should continue to refine the Programmatic Environmental Impact Statement (PEIS) through the Final PEIS and Record of Decision (ROD), carrying forward the zone-based focus and most other elements of the Supplement, and sign the ROD by fall 2012.

While these comments focus on proposals for California and Nevada, many of our comments are wider reaching and apply to the entire six western state planning region.

1. Alternatives

The Center urges the BLM and DOE ("agencies") to select the "Modified SEZ Alternative" ("SEZ alternative"). We base our recommendation on several considerations.

First, the desert lands of the southwest are rich in natural resources and biological diversity as well as providing ecosystem services invaluable to the planet and human society. As such the footprint of industrialized renewable energy plants should be minimized to the maximum extent practical and sited with great care and abundant forethought and planning. Only the SEZ alternative would meet this concern and consideration.

The second comes from an examination of the needs for solar energy development acreage estimated in the agencies' "reasonably foreseeable development scenario"[1] and the acres of potentially developable BLM-administered lands under the alternative analyzed in the PDEIS.[2]

Considering all six states, the acreage in proposed SEZs exceeds the needs of the reasonable foreseeable development scenario by over 71,000 acres. At the same time, the agencies' preferred "modified program alternative" ("preferred alternative") would exceed the projected needs by over 20 million acres.

The SEZ alternative provides a more reasoned template for solar developers to search for appropriate sites for development while protecting pristine federal lands. The preferred alternative, while more restrictive than the "no action alternative", would continue the problems associated with the "fast track process" where solar developers staked out areas for development in a helter-skelter fashion, leading to major conflicts and impacts on native ecosystems and other land uses and users.

The Center realized that the preferred alternative is enlightened by the creation of exclusionary screens[3], a proposed "Variance process"[4], and stricter pre-development requirements found in BLM Instructional Memorandums, but we still feel that a development process focused on previously agreed upon SEZs would better serve the expeditious development of solar renewable energy, focus necessary transmission to load centers preventing transmission route proliferation as well as protect valuable and irreplaceable desert ecosystems. The option for development in variance areas undermines the intended focus on development in SEZs and exponentially complicates transmission planning.

[1] Table 1.6-1
[2] Table 2.3-1
[3] Table 2.2-1
[4] Section 2.2.2.3-1

The agencies' exclusionary screens and variance process, while a great improvement over the current no action scenario, still fail to address important ecological considerations and impacts of solar development on pristine desert lands. Areas of our concern include key desert tortoise habitat that is currently outside Desert Wildlife Management Areas ("DWMA") or Areas of Critical Environmental Concern ("ACEC"), including areas identified as desert tortoise connectivity areas; BLM Sonoran desert tortoise Category I and Category II management units[5] and Habitat Management Areas (also referred to as Wildlife Habitat Management Areas); Unusual Plant Assemblages (UPAs), sage grouse and critical big game habitat not currently identified for protections in Resource Management Plans; areas important for wildlife movements and habitat connectivity; areas with high concentrations of eagles and other raptors; and, lands containing habitat for state and federally listed plant and animal species, and other lands providing habitat for imperiled but unlisted plant and animal species.

The proposed variance process would entail a potential for a high degree of conflict over siting, command a disproportionately high demand of agency resources, complicate transmission planning and threaten the streamlining envisioned for development in SEZs.

Finally, the supplement outlines a process whereby new SEZs could be indentified and created should a need arise.[6] Rather than allow the solar prospecting to continue under the preferred alternative in the "variance areas", the Center feels that developer needs for lands outside the proposed SEZs should be addressed through a new SEZ identification process which instills a bigger picture approach versus the siting of individual developer projects.

2. Desert tortoise

Recent peer-reviewed scientific literature identifies that the effects of the envisioned industrial solar development in the southwest deserts may not be compatible with wildlife conservation, and that is especially true for the Agassiz's desert tortoise (the federally listed threatened Mojave Population).[7] Therefore the agencies should apply a precautionary principle and areas that have been identified by the U.S. Fish and Wildlife Service as essential connectivity areas for desert tortoise[8] should be given the highest level of protection as Areas of Critical Environmental Concern (ACECs). These ACECs should be codified as part of the land management plan amendments required by the PEIS.

With regards to the agencies' question on desert tortoise variance requirements posed in the supplement page 2-35, if variances were to be allowed, we would urge the agencies to select "Option2", strict restrictions for any projects proposed in variance areas within the range of both Mojave and Sonoran desert tortoises.

[5] Identified in: Bureau of Land Management. 1990. Strategy for desert tortoise habitat management on public lands in Arizona. Arizona State Office, Bureau of Land Management, Department of the Interior.
[6] Appendix D
[7] Lovich and Ennen 2011
[8] USFWS 2011

The organization, Basin and Range Watch, recently submitted a proposal for the establishment of an ACEC in the Ivanpah Valley to the BLM for their consideration. Since this supplement envisions amendments to existing Resource Management Plans, the Center wishes to formally endorse this proposal, at least in concept. The Ivanpah Valley has been besieged by ill-placed solar energy developments and proposals. At the same time, it is important habitat for a genetically distinct population of desert tortoises that cross the California-Nevada state line. The conservation and recovery efforts to protect this segment of the desert tortoise population would be advanced by the creation of this ACEC.

The Ivanpah Valley is a unique valley spanning the state line between California and Nevada. Because of this biologically arbitrary boundary, impacts to biological resources from renewable energy developments in different parts of the same valley are evaluated by different states. The Ivanpah Valley is important because it is home to a dense population of the federally threatened desert tortoise as well as rare plan communities. A small portion of the valley in California is designated as a desert tortoise Area of Critical Environmental Concern (ACEC) under the Northern and Eastern Mojave Plan. A portion of federally designated critical habitat is also identified in the southeastern part of the valley.

Surveys on both sides of the state line indicate an extant, robust population of desert tortoise. In fact, the U.S. Fish and Wildlife Service's (FWS) October 10, 2010 Biological Opinion on the Ivanpah Solar Electric Generating Station (ISEGS), which is located in the southwestern part of the valley, states at p. 63: "We recommend that the Bureau amend the California Desert Conservation Area Plan to prohibit large-scale development (e.g., solar energy facilities, wind development, etc.) within the area bounded by Interstate 15, the State line, and Clark Mountains." This recommendation was limited to the land on the California side of the border, because the local office of the consulting agencies' jurisdiction was in California.

As the BLM is well aware, the ISEGS project quickly reached its "take" limit of desert tortoises and had to re-initiate consultation with the Service, which resulted in a new Biological Opinion on June 10, 2011. In the new Biological Opinion, the FWS expanded its recommendation to include the whole of the Ivanpah Valley, stating "We recommend that the Bureau amend the necessary land use plans to prohibit large-scale development (e.g., solar energy facilities, wind development, etc.) within all remaining portions of the Ivanpah Valley to reduce fragmentation within the critical linkage between the Ivanpah Critical Habitat Unit and the Eldorado Critical Habitat Unit." (at pg. 92-93). This new recommendation recognizes that the whole valley is important to the survival of this population of desert tortoise, and that the linkage between the Ivanpah Critical Habitat Unit, which is in California, and the Eldorado Critical Habitat Unit, which is in Nevada, must be kept intact. In line with the direction already identified by the FWS, BLM-administered lands within the Ivanpah Valley should be included as an exclusion area for variance applications.

Although BLM is undertaking a new cumulative effects analysis for a portion of the Ivanpah Valley (and which does not include much of the valley in Nevada), it has not finished the analysis. Nor has the BLM developed either a comprehensive bi-state assessment or a long-term management plan for this important valley. Meanwhile, the entire Ivanpah Valley has been nominated as an ACEC, in order to provide further safeguards for the desert tortoise in this

important valley as well as a suite of very rare plants and significant cultural values present there. To avoid further degradation of the valley, we urge that it be excluded from variance applications.

3. Pending solar applications

The agencies' in their supplement propose to handle solar development applications outside of proposed SEZs and submitted before the date of publication of the supplement as pending applications under existing policies.[9] This results in 79 such "pending" applications. This also results in a continuation and perpetuation of a "solar land rush process" that results in poor siting decisions, unintended environmental impacts and often severe cumulative impacts. Such projects are not adequately evaluated as to how they fit into the landscape both environmentally as well as in terms of required transmission infrastructure in the SPEIS and should be considered as part of the base-line.

By essentially "grandfathering" in the proposed class of "pending" applications, the agencies complicate and compound the permitting and approval process, adding additional burdens to scarce agency resources and potentially slowing the permitting process for projects within SEZs and ultimately defeating the purpose of the PEIS.

As a case in point, the pending application process outlined in the supplement[10] artificially imposes an unnecessary process entailing multiple complex steps and conditions. The BLM admits that it has determined that, "in appropriate circumstances, it can rely on the broad discretion it has under FLPMA to deny ROW applications prior to completing the NEPA process if such applications do not meet due diligence requirements and/or environmental criteria. Such decisions must be made with regard for the public interest and be supported by reasoned analysis and an adequate administrative record. Decisions to deny pending applications must be assessed on a case-by-case basis. BLM's denial of an application constitutes a "final agency action" and is therefore subject to administrative appeal to the Interior Board of Land Appeals (IBLA)."[11]

A review of the applications deemed to be "pending"[12] reveals that over 685,000 acres are encumbered by this designation. A vast majority of the 79 pending applications were filed prior to 2010. Taken together, these two facts demonstrate the speculative approach taken in filing these applications and the likely lack of analysis and due diligence that went into them.

The Center requests that the agencies reconsider their current definition of "pending". We suggest a threshold for consideration under existing policies and procedures be the publishing in the Federal Register of a Notice of Intent for the proposed solar development project. Any project lacking a Notice prior to the date that the supplement was noticed in the Federal Register would fall under the decision coming out of the PDEIS process.

[9] Table 1.7-1
[10] Pages 1-10 – 1-12
[11] Page 1-10
[12] Appendix A

4. **Adherence to existing wildlife management policies should be affirmed**

The Solar PEIS should explicitly affirm that BLM land management policies, except where specifically modified in accordance with the Solar PEIS, will continue to guide land management and planning decisions. In particular, we point to current policies guiding the management of wildlife policies on public lands reflected in:

- Manual 6840 on Special Status Species Management for "sensitive" species – i.e., those at-risk, but not yet listed – which directs the BLM to "improve the condition of the species' habitat" or "minimize or eliminate threats affecting the status of the species";
- Manual 6500 on Wildlife and Fisheries Management which focuses on policy to "manage habitat with emphasis on ecosystems to ensure self-sustaining populations and a natural abundance and diversity of wildlife, fish, and plant resources on public lands" and further calls for the agency to "increase the amount and quality of habitat available"; and
- Handbook 4180 on BLM Rangeland Health Standards which states that "[h]abitats are, or are making significant progress towards being restored or maintained for Federal threatened and endangered species, Federal Proposed, Category 1 and 2 Federal candidate and other special status species."

In all these cases, the BLM's existing wildlife policy requires more than maintenance of the status quo. As such, these same policies apply to decisions affecting the siting, permitting, and development of solar projects on public lands; and the Solar PEIS should reiterate the importance of complying with agency wildlife management policies.

5. Comments on specific proposed SEZs

The Center appreciates the substantive changes made in the proposed SEZs in response to comments that were submitted on the PDEIS. Our previously stated concern about the lack of available ground water to support certain solar technologies remains for all proposed SEZs. We now offer these additional observations on the proposed SEZs as they appear in the supplement.

<u>California</u>

As part of our general concerns about water resources, which are highly important resources in the arid southwest and likely to be further impacted by climate change, we also request that the Amargosa River watershed in California be removed from development consideration because of the innumerable threatened and endangered species that rely upon this watershed for existence (including the endangered Amargosa vole, the critically endangered Devil's Hole pupfish, the endangered Amargosa niterwort, the threatened Ash Meadows gumplant, the endangered least Bell's vireo, the rare Amargosa toad, and the rare Tecopa bird's beak among others) and the Amargosa's federal designation as a Wild and Scenic River in this part of its reach.

We support the agencies' decision to delete both the Pisgah and Iron Mountain SEZs which were included in the original DPEIS. Both of these areas would have had significant conflicts with natural resource values.

The SPEIS proposes the large Riverside East SEZ and within that SEZ identifies "non-development areas". The non-development areas appear to capture parts of, but not the entire important sand transport corridor that originates in Joshua Tree National Park's Pinto basin and flows to the limits of the agricultural areas south of Blythe as well as the Mc Coy wash. Regarding the sand transport corridor, the agencies should exclude additional contiguous areas of the sand transport corridor and sand source areas, for a number of reasons. First, disruption of sand transport corridor functionality near corridor sources affects all downwind resources. Secondly, sand dune habitat is a rare resource on the landscape. The geological and geographical features that result in sand transport and dune formation are extremely limited. The species that have evolved to rely on this unique habitat are also quite rare and typically endemic only to dune systems. In fact the southern most range of the Mojave fringe-toed lizard occurs only in this area, and based on the fact that this population is living in the lowest elevation and most arid part of its range, likely has greater capacity to survive climate changes modeled for the southwest deserts and therefore should be protected. Thirdly, because of the uniqueness of the Aeolian habitat, impacts to sand transport systems are therefore comparatively greater than to other more common habitat types. Impacts to sand transport systems are also much more challenging to mitigate because of the limited habitat type and complex Aeolian requirements that form and maintain the sand transport and dune habitat. Lastly, any facility put in or even adjacent to a sand transport corridor will suffer significant impacts from sand abrasion, require regular clearing of sand from structures, and generally increasing maintenance and operational costs.[13]. Therefore we request that the EIS take a second hard look at the sand transport corridor in the Riverside East SEZ and exclude all areas that help to maintain functionality of that important corridor as development areas. In addition, the microphyll woodlands as identified and mapped in the BLM's Northern and Eastern Colorado Plan (NECO) need to be more closely examined for conservation beyond the McCoy Wash.

As a general matter, significant conservation investments have been made in the California deserts, including the largest nonprofit land acquisition in U.S. history donated to the American people by the Wildlands Conservancy[14]. To BLM alone, over 482,000 acres were donated for conservation purposes. In addition other private lands have been acquired and donated to BLM as mitigation for impacts to rare desert species and habitats. These types of lands should be removed from development consideration because they were purposefully donated to BLM as conservation parcels.

The document states that "BLM will rely on the California DRECP planning effort... and the California West Chocolate Mountains Renewable Energy Evaluation Area (REEA) effort to identify new or expanded SEZs in these planning areas in the near term." (DEIS at 2-28). We encourage the agencies to craft a FPEIS that indeed allows the flexibility of incorporating the DRECP planning effort into California BLM land use plans as an amendment.

Numerous issues that the Center brought up in our California-specific comments on the DEIS remain unaddressed in the supplement and we refer you to those issues from our previous comments including:

[13] The lifespan of these projects also will likely be decreased.
[14] http://wildlandsconservancy.org/conservation_california.html

- Environmental baseline still not adequately described;
- Multiple Use Classes of the land proposed for SEZ and variance lands are not identified nor are the impacts of loss of multiple use in favor of a single use for industrial purposes
- The effects of the disturbance of desert pavement and air quality issues;
- The effects of the proposal on Reserved Water Rights in the California Desert
- Clarification of the Special Recreation Management Areas (SRMAs) issues
- Cumulative Impacts Analysis
- Alternatives Analysis

We request that these issues be addressed.

Nevada

The Center supports the elimination of the Delamar and East Mormon Mountain SEZs.

We offer the following addition comments on some of the remaining SEZs.

Amargosa SEZ
The Center appreciates the positive approach the agencies took in addressing the concerns the Center raised in previous comments. The new boundaries do a much better job at protecting desert ecosystems and rare species.

We remain concerned that nay development in the Amargosa watershed proceed with utmost caution and consideration of the innumerable threatened and endangered species that rely upon this watershed for existence (including the endangered Amargosa vole, the critically endangered Devil's Hole pupfish, the endangered Amargosa niterwort, the threatened Ash Meadows gumplant, the endangered least Bell's vireo, the rare Amargosa toad, and the rare Tecopa bird's beak among others).

Gold Point SEZ
In our comments on the DEIS, we raised the concern about the lengthy proposed transmission corridor which do not appear to have been addressed in the supplement. The assumed new transmission corridor would cross extremely dense Joshua tree woodland and scenic remote BLM areas used for hiking, camping, and other recreational activities, as well as potentially impact the historic mining town of Goldfield. The BLM should include analysis of potential impacts associated with these issues in the FPEIS, as well as measures to avoid, minimize or mitigate such impacts. We offer the suggestion that the transmission line follow the existing roadway that passes through the SEZ.

Millers SEZ
The action plan for the SEZ should include surveys for Tecopa bird's beak, an alkali flat obligate plant that could occur in the southern part of the SEZ or further south, and could be affected by development. It should also include surveys for Wong's pyrig, a springsnail that could occur south of the SEZ and be indirectly affected by groundwater modification.

Further, special considerations are needed in the SEZ's design to avoid and mitigate for impacts on migrating neo-tropical birds that traditionally use the area as a stopping point.

6. The BLM should closely coordinate the PEIS with other BLM planning efforts including the Las Vegas-Pahrump Resource Management Plan revision

As noted in the Supplement, in addition to the PEIS, the BLM is also undertaking efforts to identify renewable energy priority areas such as new SEZs in other ongoing planning efforts, including the Las Vegas-Pahrump RMP revision currently underway. (Supplement at p. 2-32) The BLM should take advantage of these opportunities to use more localized planning efforts to identify low-conflict priority areas for solar development, and the agency should ensure that these efforts are closely coordinated with the PEIS.

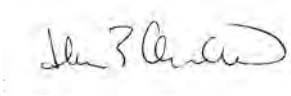
7. The BLM should provide a 60 day public comment period on the Final PEIS

There will be a significant amount of new information in the Final PEIS, including updated SEZ-specific design features, SEZ action plans, cumulative impacts analysis and monitoring and adaptive management protocols. For this reason, the BLM should provide a 60 day public comment period on the Final PEIS. While we continue to encourage the BLM to complete the PEIS in a thorough and timely manner, it is very important that the public be given the opportunity to provide meaningful input on this new information in order to satisfy the requirements of the National Environmental Policy Act. Further, this comment period should not substantially delay the timeline for completion of the PEIS, because BLM's regulations obligate the BLM to provide a 30-day protest period and a concurrent 60-day governor consistency review of land use plan amendments. 40 C.F.R. §§ 1610.5-2; 1610.5-3. The proposed 60-day public comment period would encompass these same timeframes.

In conclusion, the Center thanks the agencies for proposing thoughtful approaches to solar energy development on public lands that will focus appropriate large-scale solar energy development needed to help alleviate the effects of climate change to areas with lower conflicts and adverse impacts to desert ecosystems. This approach will help ensure that the natural and cultural resources of the federal public lands are protected for future generations. We look forward to working with the agencies as you finalize the PEIS over the coming months.

Thank you for your thorough consideration of these comments.

Sincerely yours in conservation,



Rob Mrowka
Ecologist/Nevada Conservation Advocate

Ileene Anderson
Biologist/Desert Program Director

Attachments: (sent separately)

Lovich, J. E. and J.R. Ennen 2011. Wildlife Conservation and Solar Energy Development in the Desert Southwest, United States. BioScience 61 (12): 982-992.

U.S. Fish and Wildlife Service (USFWS) 2011. BLM Solar Energy Development Program with USFWS-Recommended Desert Tortoise Linkages between Critical Habitat/DWMA Units. (Map) Pgs. 1

Thank you for your comment, Rob Mrowka.

The comment tracking number that has been assigned to your comment is SEDDsupp20127.

Comment Date: January 27, 2012 15:35:31PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20127

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Privacy Preference: Don't withhold name or address from public record
Attachment: Lovich Ennen 2011 Wildlife Conservation Solar Energy Development in the Desert SW.pdf

Comment Submitted:

document 2 of 3

Wildlife Conservation and Solar Energy Development in the Desert Southwest, United States

JEFFREY E. LOVICH AND JOSHUA R. ENNEN

Large areas of public land are currently being permitted or evaluated for utility-scale solar energy development (USSED) in the southwestern United States, including areas with high biodiversity and protected species. However, peer-reviewed studies of the effects of USSED on wildlife are lacking. The potential effects of the construction and the eventual decommissioning of solar energy facilities include the direct mortality of wildlife; environmental impacts of fugitive dust and dust suppressants; destruction and modification of habitat, including the impacts of roads; and off-site impacts related to construction material acquisition, processing, and transportation. The potential effects of the operation and maintenance of the facilities include habitat fragmentation and barriers to gene flow, increased noise, electromagnetic field generation, microclimate alteration, pollution, water consumption, and fire. Facility design effects, the efficacy of site-selection criteria, and the cumulative effects of USSED on regional wildlife populations are unknown. Currently available peer-reviewed data are insufficient to allow a rigorous assessment of the impact of USSED on wildlife.

Keywords: solar energy development, Mojave Desert, Sonoran Desert, wildlife, desert tortoises

The United States is poised to develop new renewable energy facilities at an unprecedented rate, including in potentially large areas of public land in the Southwest. This quantum leap is driven by escalating costs and demand for traditional energy sources from fossil fuels and by concerns over global climate change. Attention is focused largely on renewable forms of energy, especially solar energy. The potential for utility-scale solar energy development (USSED) and operation (USSEDO) is particularly high in the southwestern United States, where solar energy potential is high (USDOI and USDOE 2011a) and is already being harnessed in some areas. However, the potential for USSEDO conflicts with natural resources, especially wildlife, is also high, given the exceptional biodiversity (Mittermeier et al. 2002) and sensitivity (Lovich and Bainbridge 1999) of arid Southwest ecosystems, especially the Mojave (Randall et al. 2010) and Sonoran Deserts, which are already stressed by climate and human changes (CBI 2010). In addition, the desert Southwest is identified as a "hotspot" for threatened and endangered species in the United States (Flather et al. 1998). For these reasons, planning efforts should consider ways to minimize USSEDO impacts on wildlife (CBI 2010). Paradoxically, the implementation of large-scale solar energy development as an "environmentally friendly" alternative to conventional energy sources may actually increase environmental degradation on a local and on a regional scale (Bezdek 1993, Abbasi and Abbasi 2000) with concomitant negative effects on wildlife.

A logical first step in evaluating the effects of USSEDO on wildlife is to assess the existing scientific knowledge. As renewable energy development proceeds rapidly worldwide, information is slowly accumulating on the effects of USSEDO on the environment (for reviews, see Harte and Jassby 1978, Pimentel et al. 1994, Abbasi and Abbasi 2000). Gill (2005) noted that although the number of peer-reviewed publications on renewable energy has increased dramatically since 1991, only 7.6% of all publications on the topic covered environmental impacts, only 4.0% included discussions of ecological implications, and less than 1.0% contained information on environmental risks. A great deal of information on USSEDO exists in environmental compliance documents and other unpublished, non-peer-reviewed "gray" literature sources. Published scientific information on the effects on wildlife of any form of renewable energy development, including that of wind energy, is scant (Kuvlesky et al. 2007). The vast majority of the published research on wildlife and renewable energy development has been focused on the effects of wind energy development on birds (Drewitt and Langston 2006) and bats (Kunz et al. 2007) because of their sensitivity to aerial impacts. In contrast, almost no information is available on the effects of solar energy development on wildlife.

From a conservation standpoint, one of the most important species in the desert Southwest is Agassiz's desert

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tortoise (*Gopherus agassizii*; figure 1). Distributed north and west of the Colorado River, the species was listed as *threatened* under the US Endangered Species Act in 1990. Because of its protected status, Agassiz's desert tortoise acts as an "umbrella species," extending protection to other plants and animals within its range (Tracy and Brussard, 1994). The newly described Morafka's desert tortoise (*Gopherus morafkai*; Murphy et al. 2011) is another species of significant conservation concern in the desert Southwest, found east of the Colorado River. Both tortoises are important as ecological engineers who construct burrows that provide shelter to many other animal species, which allows them to escape the temperature extremes of the desert (Ernst and Lovich 2009). The importance of these tortoises is thus greatly disproportionate to their intrinsic value as species. By virtue of their protected status, Agassiz's desert tortoises have a significant impact on regulatory issues in the listed portion of their range, yet little is known about the effects of USSEDO on the species, even a quarter century after the recognition of that deficiency (Pearson 1986). Large areas of habitat occupied by Agassiz's desert tortoise in particular have potential for development of USSED (figure 2).

Figure 1. Agassiz's desert tortoise (*Gopherus agassizii*). Large areas of desert tortoise habitat are developed or being evaluated for renewable energy development, including for wind and solar energy. Photograph: Jeffrey E. Lovich.

In this article, we review the state of knowledge about the known and potential effects, both direct and indirect, of USSEDO on wildlife (table 1). Our review is based on information published primarily in peer-reviewed scientific journals for both energy and wildlife professionals. Agassiz's desert tortoise is periodically highlighted in our review because of its protected status, wide distribution in areas considered for USSEDO in the desert Southwest, and well-studied status (Ernst and Lovich 2009). In addition, we identify gaps in our understanding of the effects of USSEDO on wildlife and suggest questions that will guide future research toward a goal of mitigating or minimizing the negative effects on wildlife.

Background on proposed energy-development potential in the southwestern United States

The blueprint for evaluating and permitting the development of solar energy on public land in the region, as is required under the US National Environmental Policy Act (USEPA 2010), began in a draft environmental impact statement (EIS) prepared by two federal agencies (USDOI and USDOE 2011a). The purpose of the EIS is to "develop a new Solar Energy Program to further support utility-scale solar energy development on BLM [US Bureau of Land

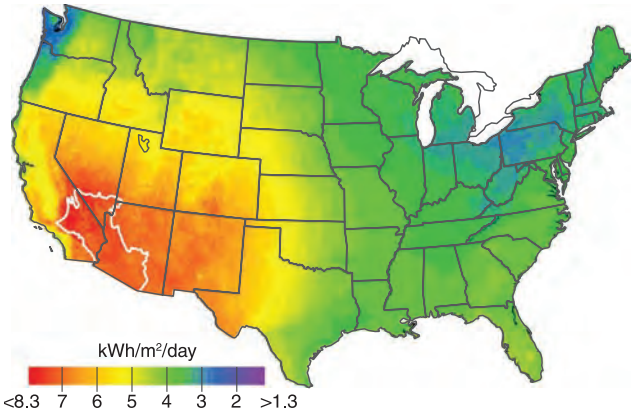

Figure 2. Concentrating solar energy potential (in kilowatt-hours per square meter per day [kWh/m²/day]) of the United States. The map shows the annual average direct normal solar resource data based on a 10-kilometer satellite-modeled data set for the period from 1998 to 2005. Refer to NREL (2011) for additional details and data sources. The white outline defines the approximate composite ranges of Agassiz's (west of the Colorado River) and Morafka's (east of the Colorado River) desert tortoises (Murphy et al. 2011) in the United States, both species of significant conservation concern. This figure was prepared by the National Renewable Energy Laboratory for the US Department of Energy (NREL 2011). The image was authored by an employee of the Alliance for Sustainable Energy, LLC, under Contract no. DE-AC36-08GO28308 with the US Department of Energy. Reprinted with permission from NREL 2011.

Table 1. List of known and potential impacts of utility-scale solar energy development on wildlife in the desert Southwest.

Impacts due to facility construction and decommissioning	Impacts due to facility presence, operation, and maintenance
Destruction and modification of wildlife habitat	Habitat fragmentation and barriers to movement and gene flow
Direct mortality of wildlife	Noise effects
Dust and dust-suppression effects	Electromagnetic field effects
Road effects	Microclimate effects
Off-site impacts	Pollution effects from spills
Destruction and modification of wildlife habitat	Water consumption effects
	Fire effects
	Light pollution effects, including polarized light
	Habitat fragmentation and barriers to movement and gene flow
	Noise effects

Management] -administered lands… and to ensure consistent application of measures to avoid, minimize, or mitigate the adverse impacts of such development" (p. ES-2). As of February 2010, the BLM had 127 active applications for solar facilities on lands that the BLM administers. According to USDOI and USDOE (2011a), all of the BLM-administered land in six states (California, Arizona, Utah, Nevada, New Mexico, and Colorado) was considered initially, for a total of 178 million hectares (ha). Not all of that land is compatible with solar energy development, so three alternative configurations are listed by USDOI and USDOI (2011a) for consideration, ranging from 274,244 to 39,972,558 ha. The larger figure is listed under the *no action alternative* where BLM would continue to use existing policy and guidance to evaluate applications. Of the area being considered under the two action alternatives, approximately 9 million ha meet the criteria established under the BLM's preferred action alternative to support solar development. Twenty-five criteria were used to exclude certain areas of public land from solar development and include environmental, social, and economic factors. The preferred alternative also included the identification of proposed *solar energy zones* (SEZs), defined as "area[s] with few impediments to utility-scale production of solar energy" (USDOI and USDOE 2011a, p. ES-7). By themselves, these SEZs constitute the nonpreferred action alternative of 274,244 ha listed above. Maps of SEZs are available at *http://solareis.anl.gov/documents/dpeis/index.cfm*.

Several sensitive, threatened, or endangered species are being considered within the EIS, but Agassiz's desert tortoise is one of only four species noted whose very presence at a site may be sufficient to exclude USSED in special cases (see table ES.2-2 in USDOI and USDOE 2011a). The potential effects of USSEDO are not trivial for tortoises or other wildlife species. Within the area covered in the draft EIS by USDOI and USDOE (2011a), it is estimated that approximately 161,943 ha of Agassiz's desert tortoise habitat will be directly affected. However, when including direct and indirect impacts on habitat (excluding transmission lines and roads that would add additional impacts; see Lovich and Bainbridge 1999, Kristan and Boarman 2007), it is estimated that approximately 769,230 ha will be affected. Some SEZs are adjacent to critical habitat designated for the recovery of Agassiz's desert tortoise, and this proximity is considered part of the indirect impacts.

On 28 October 2011, while this paper was in press, the BLM and US Department of Energy released a supplement to the EIS (USDOI and USDOE 2011b, 2011c) after receiving more than 80,500 comments. The no action alternative remains the same as in the EIS. The new preferred alternative (slightly reduced to 8,225,179 ha as the modified program alternative) eliminates or adjusts SEZs (now reduced to 115,335 ha in 17 zones as the modified SEZ alternative) to ensure that they are not in high-conflict areas and provides incentives for their use. The new plan also proposes a process to accommodate additional solar energy development outside of SEZs and to revisit ongoing state-based planning efforts to allow consideration of additional SEZs in the future.

The impacts of USSED on wildlife: Effects due to construction and decommissioning

The construction and eventual decommissioning of solar energy facilities will have impacts on wildlife, including rare and endangered species, and on their habitats in the desert (Harte and Jassby 1978). These activities involve significant ground disturbance and direct (e.g., mortality) and indirect (e.g., habitat loss, degradation, modification) impacts on wildlife and their habitat (Kuvlesky et al. 2007). Solar energy facilities require large land areas to harness sunlight and convert it to electrical energy. According to Wilshire and colleagues (2008), photovoltaic panels with a 10% conversion efficiency would need to cover an area of about 32,000 square kilometers, or an area a little smaller than the state of Maryland, to meet the current electricity demands of the United States. Many of the areas being considered for the development of solar energy in the Mojave and Sonoran Deserts are, at present, relatively undisturbed (USDOI and USDOE 2011a).

The extent of surface disturbance of USSED is related to the cooling technology used. Because of the scarcity of water in the desert Southwest region, dry-cooling systems, which consume 90%–95% less water than wet-cooling systems (EPRI 2002), are becoming a more viable option for concentrating solar facilities. Although wet-cooling systems are more economical and efficient, they consume larger amounts of water per kilowatt-hour (Torcellini et al. 2003). Unlike wet-cooling systems, dry-cooling systems use ambient air, instead of water, to cool the exhaust steam from the turbines. However, to achieve a heat-rejection efficiency similar to that in a wet-cooling system, Khalil and colleagues (2006) estimated that a direct dry-cooling system will require a larger footprint and would thus affect more wildlife habitat.

Although we found no information in the scientific literature about the direct effects of USSED on wildlife, the ground-disturbance impacts are expected to be similar to those caused by other human activities in the desert (Lovich and Bainbridge 1999).

Dust and dust suppressants. USSED transforms the landscape substantially through site preparation, including the construction of roads and other infrastructure. In addition, many solar facilities require vegetation removal and grading. These construction activities produce dust emissions, especially in arid environments (Munson et al. 2011), which already have the potential for natural dust emission. Dust can have dramatic effects on ecological processes at all scales (reviewed by Field et al. 2010). At the smallest scale, wind erosion, which powers dust emission, can alter the fertility and water-retention capabilities of the soil. Physiologically, dust can adversely influence the gas exchange, photosynthesis, and water usage of Mojave Desert shrubs (Sharifi et al. 1997). Depending on particle size, wind speed, and other factors, dust emission can physically damage plant species through root exposure, burial, and abrasions to their leaves and stems. The physiological and physical damage to plant species inflicted by dust emissions could ultimately reduce the plants' primary production and could indirectly affect wildlife food plants and habitat quality.

From an operational perspective, dust particles reduce mirror and panel efficiency in converting solar energy into heat or electricity. To combat dust, solar energy facilities apply various dust suppressants to surfaces with exposed soil (e.g., graded areas, areas with vegetation removed, roads). There are eight categories of common dust suppressants used for industrial applications: water, salts and brines, organic nonpetroleum products, synthetic polymers, organic petroleum, electrochemical substances, clay additives, and mulch and fiber mixtures (reviewed in Piechota et al. 2004). In a study conducted in the Mojave Desert in which the hydrological impacts of dust suppressants were compared, Singh and colleagues (2003) reported that changes did occur in the volume, rate, and timing of runoff when dust suppressants were used. In particular, petroleum-based and acrylic-polymer dust suppressants drastically influenced the hydrology of disturbed areas by increasing runoff volume and changing its timing. When it is applied to disturbed desert soils, magnesium chloride ($MgCl_2$), a commonly used salt-based dust depressant, does not increase runoff volume but does, however, increase the total suspended solids loads in runoff (Singh et al. 2003).

Others have highlighted the fact that there is a dearth of scientific research and literature on the effects of dust suppressants on wildlife, including the most commonly used category of dust depressant: brines and salts (Piechota et al. 2004, Goodrich et al. 2008). However, the application of $MgCl_2$ to roads was correlated with a higher frequency of plant damage (Goodrich et al. 2008). Because chloride salts, including $MgCl_2$, are not confined to the point of application but have the ability to be transported in runoff (White and Broadly 2001), the potential exists for a loss of primary production associated with plant damage in the habitats surrounding a solar facility, which could directly affect wildlife habitat.

Mortality of wildlife. We are not aware of any published studies documenting the direct effects of USSED on the survival of wildlife. However, subterranean animals can be affected by USSED, including species that hibernate underground. In the Sonoran Desert portion of California, Cowles (1941) observed that most reptiles in the Coachella Valley hibernated at depths of less than 33 centimeters (cm), with many at considerably shallower depths. Included in his observations were flat-tailed horned lizards (*Phrynosoma mcallii*)—a species of special concern in the region because of solar energy development (USDOI and USDOE 2011a)—and the federally protected Coachella Valley fringe-toed lizard (*Uma inornata*). Even lightweight vehicles like motorcycles are capable of causing greatly increased soil density (soil compaction) at a depth of 30–60 cm as their tires pass over the surface (Webb 1983). These observations suggest that vehicular activities in the desert have the potential to kill or entrap large numbers of subterranean animals (Stebbins 1995) through compressive forces or burrow collapse. Similar or greater impacts would be expected from the heavy equipment associated with the construction activities at an energy facility.

Destruction and modification of wildlife habitat. Despite the absence of published, peer-reviewed information on the effects of USSED on wildlife and their habitats, a considerable body of literature exists on the effects of other ground-disturbing activities on both ecological patterns and processes that are broadly comparable. Ground-disturbing activities affect a variety of processes in the desert, including soil density, water infiltration rate, vulnerability to erosion, secondary plant succession, invasion by exotic plant species, and stability of cryptobiotic soil crusts (for reviews, see Lovich and Bainbridge 1999, Webb et al. 2009). All of these processes have the ability—individually and together—to alter habitat quality, often to the detriment of wildlife. Any disturbance and alteration to the desert landscape, including the construction and decommissioning of utility-scale solar energy facilities, has the potential to increase soil erosion. Erosion can physically and physiologically affect plant species and can thus adversely influence primary production (Sharifi et al. 1997, Field et al. 2010) and food availability for wildlife.

Solar energy facilities require substantial site preparation (including the removal of vegetation) that alters topography and, thus, drainage patterns to divert the surface flow associated with rainfall away from facility infrastructure (Abbasi and Abbasi 2000). Channeling runoff away from plant communities can have dramatic negative effects on water availability and habitat quality in the desert, as was shown by Schlesinger and colleagues (1989). Areas deprived

of runoff from sheet flow support less biomass of perennial and annual plants relative to adjacent areas with uninterrupted water-flow patterns.

The impacts of roads. Roads are required in order to provide access to solar energy infrastructure. Both paved and unpaved roads have well-documented negative effects on wildlife (Forman and Alexander 1998), and similar effects are expected in utility-scale solar energy facilities. Although road mortality is most easily detected on the actual roadway, the effects of roads extend far beyond their physical surface. In a study of the effects of roads on Agassiz's desert tortoise populations in southern Nevada, von Seckendorff Hoff and Marlow (2002) examined transects along roads with traffic volumes varying from 25 to 5000 vehicles per day. Tortoises and tortoise sign (e.g., burrows, shells, scat) decreased with their proximity to a road. On roads with high traffic volumes, tortoises and tortoise sign were reduced as far as 4000 meters from the roadside. Roads with lower traffic volumes had fewer far-reaching effects.

Another effect of roads in the desert is the edge enhancement of plants and arthropod herbivores (Lightfoot and Whitford 1991). Perennial plants along the roadside are often larger than those farther away, and annual plant germination is often greatest along the shoulders of roads. It is possible that increased runoff due to impervious pavement or compacted soil contributes to this heterogeneity of vegetation in relationship to a road. Agassiz's desert tortoises may select locations for burrow construction that are close to roads, perhaps because of this increased productivity of food plants (Lovich and Daniels 2000). Although this situation suggests potentially beneficial impacts for herbivorous species of wildlife, such as tortoises, it increases their chance of being killed by vehicle strikes, as was shown by von Seckendorff Hoff and Marlow (2002).

Off-site impacts. Direct impacts on wildlife and habitat can occur well outside the actual footprint of the energy facility. Extraction of large amounts of raw materials for the construction of solar energy facilities (e.g., aggregate, cement, steel, glass); transportation and processing of those materials; the need for large amounts of water for cooling some installations; and the potential for the production of toxic wastes, including coolants, antifreeze, rust inhibitors, and heavy metals, can affect wildlife adjacent to or far from the location of the facility (Abbasi and Abbasi 2000). Abbasi and Abbasi (2000) summarized data suggesting that the material requirements for large-scale solar facilities exceed those for conventional fossil-fuel plants on a cost-per-unit-of-energy basis. In addition, water used for steam production at one solar energy facility in the Mojave Desert of California contained selenium, and the wastewater was pumped into evaporation ponds that attracted birds that fed on invertebrates. Although selenium toxicity was not considered a threat on the basis of the results of one study, the possibility exists for harmful bioaccumulation of this toxic micronutrient (Herbst 2006). In recognition of the hazard, Pimentel and colleagues (1994) suggested that fencing should be used to keep wildlife away from these toxic ponds.

The impacts of USSED on wildlife: Effects due to operation and maintenance

This category includes the effects related to the presence and operation of the solar facility, not the physical construction and decommissioning of the same. Some of the effects (e.g., mortality of wildlife and impacts caused by roads) are similar to those discussed previously for construction and decommissioning and are not discussed further.

Habitat fragmentation. Until relatively recently, the desert Southwest was characterized by large blocks of continuous and interconnected habitat. Roads and urban development continue to contribute to habitat fragmentation in this landscape. Large-scale energy development has the potential to add to and exacerbate the situation, presenting potential barriers to movement and genetic exchange in wildlife populations, including those of bighorn sheep (*Ovis canadensis*), deer (*Odocoileus* spp.), tortoises, and other species of concern and social significance. Research conducted on the effects of oil and gas exploration and development (OGED) on wildlife in the Intermountain West provides a possible analog to USSEDO, since comparable data are not available for the desert Southwest. The potential effects on mule deer (*Odocoileus hemionus*) and other wildlife species include impediments to free movement, the creation of migration bottlenecks, and a reduction in effective winter range size. Mule deer responded immediately to OGED by moving away from disturbances, with no sign of acclimation during the three years of study by Sawyer and colleagues (2009). Some deer avoidance resulted in their use of less-preferred and presumably less-suitable habitats.

Despite a lack of data on the direct contributions of USSEDO to habitat fragmentation, USSEDO has the potential to be an impediment to gene flow for some species. Although the extent of this impact is, as yet, largely unquantified in the desert, compelling evidence for the effects of human-caused habitat fragmentation on diverse wildlife species has already been demonstrated in the adjacent coastal region of southern California (Delaney et al. 2010).

Noise effects. Industrial noise can have impacts on wildlife, including changes to their habitat use and activity patterns, increases in stress, weakened immune systems, reduced reproductive success, altered foraging behavior, increased predation risk, degraded communication with conspecifics, and damaged hearing (Barber et al. 2009, Pater et al. 2009). Changes in sound level of only a few decibels can elicit substantial animal responses. Most noise associated with USSEDO is likely to be generated during the construction phase (Suter 2002), but noise can also be produced during operation and maintenance activities. Brattstrom and Bondello (1983) documented the effects of noise on Mojave

Desert wildlife on the basis of experiments involving off-highway vehicles. Noise from some of these vehicles can reach 110 decibels—near the threshold of human pain and certainly within the range expected for various construction, operation, and maintenance activities (Suter 2002) associated with USSEDO. This level of noise caused hearing loss in animals, such as kangaroo rats (*Dipodomys* spp.), desert iguanas (*Dipsosaurus dorsalis*), and fringe-toed lizards (*Uma* spp.). In addition, it interfered with the ability of kangaroo rats to detect predators, such as rattlesnakes (*Crotalus* spp.), and caused an unnatural emergence of aestivating spadefoot toads (*Scaphiopus* spp.), which would most likely result in their deaths. Because of impacts on wildlife, Brattstrom and Bondello (1983) recommended that "all undisturbed desert habitats, critical habitats, and all ranges of threatened, endangered, or otherwise protected desert species" (p. 204) should be protected from loud noise.

Although many consider solar energy production a "quiet" endeavor, noise is associated with their operation. For example, facilities at which wet-cooling systems are used will have noises generated by fans and pumps. As for facilities with dry-cooling systems, only noise from fans will be produced during operation (EPRI 2002). Because of the larger size requirements of dry-cooling systems, there will be more noise production associated with an increase in the number of fans.

Electromagnetic field generation. When electricity is passed through cables, it generates electric and magnetic fields. USSEDO requires a large distribution system of buried and overhead cables to transmit energy from the point of production to the end user. Electromagnetic fields (EMFs) produced as energy flows through system cables are a concern from the standpoint of both human and wildlife health, yet little information is available to assess the potential impact of the EMFs associated with USSEDO on wildlife. Concerns about EMFs have persisted for a long time, in part because of controversy over whether they're the actual cause of problems and disagreement about the underlying mechanisms for possible effects. For example, there is presently a lack of widely accepted agreement about the biological mechanisms that can explain the consistent associations between extremely low-frequency EMF exposure from overhead power lines and childhood leukemia, although there is no shortage of theories (Gee 2009).

Some conclude that the effects of EMFs on wildlife will be minor because of reviews of the often conflicting and inconclusive literature on the topic (Petersen and Malm 2006). Others suggest that EMFs are a possible source of harm for diverse species of wildlife and contribute to the decline of some mammal populations. Balmori (2010) listed possible impacts of chronic exposure to athermal electromagnetic radiation, which included damage to the nervous system, disruption of circadian rhythm, changes in heart function, impairment of immunity and fertility, and genetic and developmental problems. He concluded that enough evidence exists to confirm harm to wildlife but suggested that further study is urgently needed. Other authors suggest that the generally inconsistent epidemiological evidence in support of the effects of EMFs should not be cause for inaction. Instead, they argue that the precautionary principle should be applied in order to prevent a recurrence of the "late lessons from early warnings" scenario that has been repeated throughout history (Gee 2009).

Magnetic information is used for orientation by diverse species, from insects (Sharma and Kumar 2010) to reptiles (Perry A et al. 1985). Despite recognition of this phenomenon, the direct effects of USSEDO-produced EMFs on wildlife orientation remains unknown.

Microclimate effects. The alteration of a landscape through the removal of vegetation and the construction of structures by humans not only has the potential of increasing animal mortality but also changes the characteristics of the environment in a way that affects wildlife. The potential for microclimate effects unique to solar facilities was discussed by Pimentel and colleagues (1994) and by Harte and Jassby (1978). It has been estimated that a concentrating solar facility can increase the albedo of a desert environment by 30%–56%, which could influence local temperature and precipitation patterns through changes in wind speed and evapotranspiration. Depending on their design, large concentrating solar facilities may also have the ability to produce significant amounts of unused heat that could be carried downwind into adjacent wildlife habitat with the potential to create localized drought conditions. The heat produced by central-tower solar facilities can burn or incinerate birds and flying insects as they pass through the concentrated beams of reflected light (McCrary et al. 1986, Pimentel et al. 1994, Tsoutsos et al. 2005, Wilshire et al. 2008).

A dry-cooled solar facility—in particular, one with a concentrating-trough system—could reject heated air from the cooling process with temperatures 25–35 degrees Fahrenheit higher than the ambient temperature (EPRI 2002). This could affect the microclimate on site or those in adjacent habitats. To our knowledge, no research is available to assess the effects of USSEDO on temperature or that of any other climatic variable on wildlife. However, organisms whose sex is determined by incubation temperatures, such as both species of desert tortoises, may be especially sensitive to temperature changes, because small temperature changes have the potential to alter hatchling sex ratios (Hulin et al. 2009).

Pollutants from spills. USSEDO, especially at wet-cooled solar facilities, has a potential risk for hazardous chemical spills on site, associated with the toxicants used in cooling systems, antifreeze agents, rust inhibitors, herbicides, and heavy metals (Abbasi and Abbasi 2000, Tsoutsos et al. 2005). Wet-cooling solar systems must use treatment chemicals (e.g., chlorine, bromine, selenium) and acids and bases (e.g., sulfuric acid, sodium hydroxide, hydrated lime) for the prevention of fouling and scaling and for pH control of the water used in their recirculating systems (EPRI 2002).

Solar facilities at which a recirculating system is used also have treatment and disposal issues associated with water discharge, known as *blowdown*, which is water with a high concentration of dissolved and suspended materials created by the numerous evaporation cycles in the closed system (EPRI 2002). These discharges may contain chemicals used to prevent fouling and scaling. The potentially tainted water is usually stored in evaporative ponds, which further concentrates the toxicants (Herbst 2006). Because water is an attraction for desert wildlife, numerous species could be adversely affected. The adverse effects of the aforementioned substances and similar ones on wildlife are well documented in the literature, and a full review is outside the scope of this article. However, with the decreased likelihood of wet-cooling systems for solar facilities in the desert, the risk of hazardous spills and discharges on site will be less in the future, because dry-cooling systems eliminate most of the associated water-treatment processes (EPRI 2002). However, there are still risks of spills associated with a dry-cooling system. More research is needed on the adverse effects of chemical spills and tainted-water discharges specifically related to USSEDO on wildlife.

Water consumption (wet-cooled solar). The southwestern United States is a water-poor region, and water use is highly regulated throughout the area. Because of this water limitation, the type of cooling systems installed at solar facilities is limited as well. For example, a once-through cooling system—a form of wet cooling—is generally not feasible in arid environments, because there are few permanent bodies of water (i.e., rivers, oceans, and lakes) from which to draw cool water and then into which to release hot water. Likewise, other wet-cooling options, such as recirculating systems and hybrid systems, are becoming less popular because of water shortage issues in the arid region. Therefore, the popularity of the less-efficient and less-economical dry-cooling systems is increasing on public lands. Water will also be needed at solar facilities to periodically wash dust from the mirrors or panels. Although there are numerous reports in which the costs and benefits were compared both environmentally and economically (EPRI 2002, Khalil et al. 2006) between wet- and dry-cooled solar facilities, to our knowledge no one has actually quantified the effects of water use and consumption on desert wildlife in relation to the operation of these facilities.

Fire risks. Any system that produces electricity and heat has a potential risk of fire, and renewable energy facilities are no exception. Concentrating solar energy facilities harness the sun's energy to heat oils, gases, or liquid sodium, depending on the system design (e.g., heliostat power, trough, dish). With temperatures reaching more than 300 degrees Celsius in most concentrated solar systems, spills and leaks from the coolant system increase the risk of fires (Tsoutsos et al. 2005). Even though all vegetation is usually removed from the site during construction, which reduces the risk of a fire propagating on and off site, the increase of human activity in a desert region increases the potential for fire, especially along major highways and in the densely populated western Mojave Desert (Brooks and Matchett 2006).

The Southwest deserts are not fire-adapted ecosystems: fire was historically uncommon in these regions (Brooks and Esque 2002). However, with the establishment of numerous flammable invasive annual plants in the desert Southwest (Brown and Minnich 1986), coupled with an increase in anthropogenic ignitions, fire has become more common in the deserts, which adversely affects wildlife (Esque et al. 2003). For Agassiz's desert tortoise, fire can translate into direct mortality at renewable energy facilities (Lovich and Daniels 2000) and can cause reductions in food and habitat quality. To our knowledge, however, there is no scientific literature related to the effects of USSEDO-caused fire on wildlife.

Light pollution. Two types of light pollution could be produced by solar energy facilities: ecological light pollution (ELP; Longcore and Rich 2004) and polarized light pollution (PLP; Horváth et al. 2009). The latter, PLP, could be produced at high levels at facilities using photovoltaic solar panels, because dark surfaces polarize light. ELP can also be produced at solar facilities in the form of reflected light. The reflected light from USSEDO has been suggested as a possible hazard to eyesight (Abbasi and Abbasi 2000). ELP could adversely affect the physiology, behavior, and population ecology of wildlife, which could include the alteration of predation, competition, and reproduction (for reviews, see Longcore and Rich 2004, Perry G et al. 2008). For example, the foraging behavior of some species can be adversely affected by light pollution (for a review, see Longcore and Rich 2004). The literature is limited regarding the impact of artificial lighting on amphibians and reptiles (Perry G et al. 2008), and, to our knowledge, there are no published studies in which the impacts on wildlife of light pollution produced by USSEDO have been assessed. However, light pollution is considered by G. Perry and colleagues (2008) to be a serious threat to reptiles, amphibians, and entire ecological communities that requires consideration during project planning. G. Perry and colleagues (2008) further recommended the removal of unnecessary lighting so that the lighting conditions of nearby habitats would be as close as possible to their natural state.

Numerous anthropogenic products—usually those that are dark in color (e.g., oil spills, glass panes, automobiles, plastics, paints, asphalt roads)—can unnaturally polarize light, which can have adverse effects on wildlife (for a review, see Horváth et al. 2009). For example, numerous animal species use polarized light for orientation and navigation purposes (Horváth and Varjú 2004). Therefore, the potential exists for PLP to disrupt the orientation and migration abilities of desert wildlife, including those of sensitive species. In the review by Horváth and colleagues (2009), which was focused mostly on insects but included a few avian references, they highlighted the fact that anthropogenic products that produce PLP can appear to be water bodies to wildlife and can become ecological traps for insects and, to a lesser degree, avian species. Therefore,

utility-scale solar energy facilities at which photovoltaic technology is used in the desert Southwest could create a direct effect on insects (i.e., ecological trap), which could have profound but unquantified effects on the ecological community surrounding the solar facility. In addition, there may be indirect effects on wildlife through the limitation of plant food resources, especially if pollinators are negatively affected. As was stated by Horváth and colleagues (2009), the population- and community-level effects of PLP can only be speculated on because of the paucity of data.

Unanswered questions and research needs

In our review of the peer-reviewed scientific literature, we found only one peer-reviewed publication on the specific effects of utility-scale solar energy facility operation on wildlife (McCrary et al. 1986) and none on utility-scale solar energy facility construction or decommissioning. Although it is possible that we missed other peer-reviewed publications, our preliminary assessment demonstrates that very little critically reviewed information is available on this topic. The dearth of published, peer-reviewed scientific information provides an opportunity to identify the fundamental research questions for which resource managers need answers. Without those answers, resource managers will be unable to effectively minimize the negative effects of USSEDO on wildlife, especially before permitting widespread development of this technology on relatively undisturbed public land.

Before-and-after studies. Carefully controlled studies are required in order to tease out the direct and indirect effects of USSEDO on wildlife. Pre- and postconstruction evaluations are necessary to identify the effects of renewable energy facilities and to compare results across studies (Kunz et al. 2007). In their review of wind energy development and wildlife, with an emphasis on birds, Kuvlesky and colleagues (2007) noted that experimental designs and data-collection standards were typically inconsistent among studies. This fact alone contributes measurably to the reported variability among studies or renders comparisons difficult, if not impossible. Additional studies should emphasize the need for carefully controlled before-after-control-impact (BACI) studies (Kuvlesky et al. 2007) with replication (if possible) and a detailed description of site conditions. The potential payoff for supporting BACI studies now could be significant: They could provide answers for how to mitigate the negative impacts on wildlife in a cost-effective and timely manner.

What are the cumulative effects of large numbers of dispersed or concentrated energy facilities? Large portions of the desert Southwest have the potential for solar energy development. Although certain areas are targeted for large facilities because of resource availability and engineering requirements (e.g., their proximity to existing transmission corridors), other areas may receive smaller, more widely scattered facilities. A major unanswered question is what the cumulative impacts of these facilities on wildlife are. Would it be better for wildlife if development is concentrated or if it is scattered in smaller, dispersed facilities? Modeling based on existing data would be highly suspect because of the deficiency of detailed site-level published information identified in our analysis. Except for those on habitat destruction and alteration related to other human endeavors, there are no published articles on the population genetic consequences of habitat fragmentation related to USSED, which makes this a high priority for future research.

What density or design of development maximizes energy benefits while minimizing negative effects on wildlife? We are not aware of any published peer-reviewed studies in which the impacts on wildlife of different USSED densities or designs have been assessed. For example, would it benefit wildlife to leave strips of undisturbed habitat between rows of concentrating solar arrays? Research projects in which various densities, arrays, or designs of energy-development infrastructure are considered would be extremely valuable. BACI studies would be very useful for addressing this deficiency.

What are the best sites for energy farms with respect to the needs of wildlife? The large areas of public land available for renewable energy development in the desert Southwest encompass a wide variety of habitats. Although this provides a large number of choices for USSED, not all areas have the same energy potential because of resource availability and the limitations associated with engineering requirements, as was noted above. Detailed information on wildlife distribution and habitat requirements are crucially needed for proper site location and for the design of renewable energy developments (Tsoutsos et al. 2005). Public-resource-management agencies have access to rich geospatial data sets based on many years of inventories and resource-management planning. These data could be used to identify areas of high value for both energy development and wildlife. Areas with overlapping high values could be carefully studied through risk assessment when it appears that conflicts are likely. Previously degraded wildlife habitats, such as old mine sites, overgrazed pastures, and abandoned crop fields, may be good places to concentrate USSED to minimize its impacts on wildlife (CBI 2010).

Can the impacts of solar energy development on wildlife be mitigated? The construction of solar energy facilities can cause direct mortality of wildlife. In addition, building these facilities results in the destruction and fragmentation of wildlife habitat and may increase the possibility of fire, as was discussed above. Beyond these effects, essentially nothing is known about the operational effects of solar energy facilities on wildlife. Current mitigation strategies for desert tortoises and other protected species include few alternatives other than translocation of the animals from the footprint of the development into other areas. Although this strategy may be appealing at first glance, animal translocation has a checkered history of success, especially for reptiles and amphibians (Germano and Bishop 2008, CBI 2010). Translocation

has yet to be demonstrated as a viable long-term solution that would mitigate the destruction of Agassiz's desert tortoise habitat (Ernst and Lovich 2009, CBI 2010).

Conclusions

All energy production has associated social and environmental costs (Budnitz and Holdren 1976, Bezdek 1993). In their review of the adverse environmental effects of renewable energy development, Abbasi and Abbasi (2000) stated that "renewable energy sources are not the panacea they are popularly perceived to be; indeed, in some cases, their adverse environmental impacts can be as strongly negative as the impacts of conventional energy sources" (p. 121). Therefore, responsible, efficient energy production requires both the minimization of environmental costs and the maximization of benefits to society—factors that are not mutually exclusive. Stevens and colleagues (1991) and Martín-López and colleagues (2008) suggested that the analyses of costs and benefits should include both wildlife use and existence values. On the basis of our review of the existing peer-reviewed scientific literature, it appears that insufficient evidence is available to determine whether solar energy development, as it is envisioned for the desert Southwest, is compatible with wildlife conservation. This is especially true for threatened species such as Agassiz's desert tortoise. The many other unanswered questions that remain after reviewing the available evidence provide opportunities for future research, as was outlined above.

The shift toward renewable energy is widely perceived by the public as a "green movement" intended to reduce greenhouse-gas emissions and acid rain and to curb global climate change (Abbasi and Abbasi 2000). However, as was noted by Harte and Jassby (1978), just because an energy technology is simple, thermodynamically optimal, renewable, or inexpensive does not mean that it will be benign from an ecological perspective. The issue of wildlife impacts is much more complex than is widely appreciated, especially when the various scales of impact (e.g., local, regional, global) are considered. Our analysis shows that, on a local scale, so little is known about the effects USSEDO on wildlife that extrapolation to larger scales with any degree of confidence is currently limited by an inadequate amount of scientific data. Therefore, without additional research to fill the significant information void, accurate assessment of the potential impacts of solar energy development on wildlife is largely theoretical but needs to be empirical and well-founded on supporting science.

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Thank you for your comment, Rob Mrowka.

The comment tracking number that has been assigned to your comment is SEDDsupp20128.

Comment Date: January 27, 2012 15:37:09PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20128

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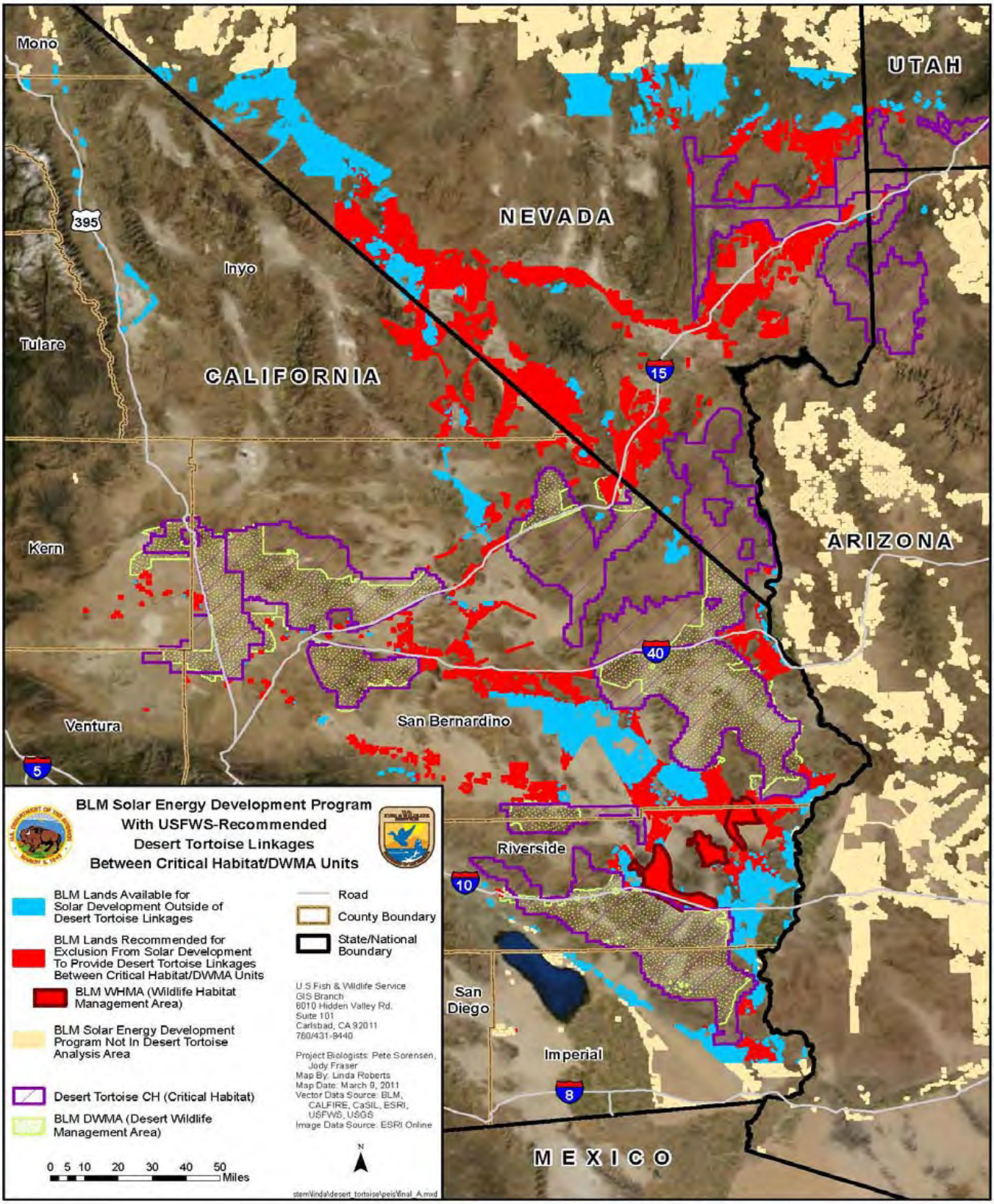
Attachment: USFWS 2011 Map of DT connectivity areas.pdf

Comment Submitted:

doc 3 of 3


Mono
UTAH
NEVADA
395
Inyo
Tulare
CALIFORNIA
15
Kern
ARIZONA
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Ventura
San Bernardino
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Riverside
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San Diego
Imperial
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MEXICO
BLM Solar Energy Development Program
With USFWS-Recommended
Desert Tortoise Linkages
Between Critical Habitat/DWMA Units
BLM Lands Available for Solar Development Outside of Desert Tortoise Linkages
BLM Lands Recommended for Exclusion From Solar Development To Provide Desert Tortoise Linkages Between Critical Habitat/DWMA Units
BLM WHMA (Wildlife Habitat Management Area)
BLM Solar Energy Development Program Not In Desert Tortoise Analysis Area
Desert Tortoise CH (Critical Habitat)
BLM DWMA (Desert Wildlife Management Area)
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State/National Boundary
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U.S Fish & Wildlife Service
GIS Branch
6010 Hidden Valley Rd.
Suite 101
Carlsbad, CA 92011
760/431-9440
Project Biologists: Pete Sorensen, Jody Fraser
Map By: Linda Roberts
Map Date: March 9, 2011
Vector Data Source: BLM, CALFIRE, CaSIL, ESRI, USFWS, USGS
Image Data Source: ESRI Online
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Thank you for your comment, Andrew Wang.

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Comment Submitted:

SOLARRESERVE®

January 27, 2012 Via Internet

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Subject: Comments by SolarReserve on the Supplemental Draft Solar PEIS

Recognizing the considerable efforts invested by multiple stakeholders in the development of the Solar Programmatic Environmental Impact Statement and its Supplemental Draft (Solar PEIS), and further recognizing BLM's goals to complete the process in 2012, SolarReserve appreciates the opportunity to provide our comments below.

By way of introduction, SolarReserve, LLC – headquartered in Santa Monica, California – is an experienced and entrepreneurial company developing large-scale solar energy projects worldwide. It holds the exclusive worldwide license to the molten salt, concentrating solar power (CSP) tower technology developed by Pratt & Whitney Rocketdyne, a subsidiary of United Technologies Corporation. Since its formation in late 2007, SolarReserve's team of power project professionals have assembled a CSP development portfolio of more than 25 projects featuring its licensed solar technology with potential output of more than 3,000 MW in the United States and Europe; with early stage activities in other international markets including the Middle East, North and South Africa, Australia, China, India and Latin America. SolarReserve is also developing more than 1,500 MW of photovoltaic projects across the United States and internationally. SolarReserve's experienced management team has previously developed and financed more than $15 billion in renewable and conventional energy projects in more than a dozen countries around the world.

SolarReserve's molten salt CSP tower technology was successfully demonstrated in California under a U.S. Department of Energy-sponsored pilot project in the late 1990s. The 10 MW *Solar Two* pilot facility utilized a molten salt receiver designed, engineered and assembled by Rocketdyne, now a part of United Technologies Corporation. SolarReserve's lead project, the 110 MW *Crescent Dunes Solar Energy Project* located on BLM land near Tonopah, Nevada started construction in September of 2011. SolarReserve is also in the final stages of NEPA compliance for the *Quartzsite Solar Energy Project* on BLM land in Western Arizona.

Our comments are as follows:

Solar Energy Zones

SolarReserve agrees that a designated number of acres set aside for large solar development and properly incentivized with streamlined NEPA compliance requirements, including as examples certainty around consultation under Section 106 of the National Historic Preservation Act and certainty around impact mitigation expectations, will stimulate such development. Given the near term lack of electrical demand in the Desert Southwest and the California-centric demand for renewable energy driven by an aggressive 33% Renewable Portfolio Standard, SolarReserve views the current SEZ acres as a combination of inadequately small and located the wrong places (i.e., distant from California load centers and not designated using appropriate transmission considerations). SolarReserve therefore urges for additional new SEZs to be co-located with transmission

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existing or in development, as such capacity represents one of the single largest hurdles in our work. In addition, we request that the variance process and the new SEZ designation process to be more clearly defined and "workable" in that it should incorporate flexibilty toward new project siting outside of SEZs as market conditions ultimately evolve and improve.

Pending Applications

Given the significant number of existing applications defined as "pending" within the Solar PEIS framework, SolarReserve requests that BLM continue to process these applications under existing policies and Instructional Memoranda, and not to subject them to the forthcoming PEIS Record of Decision. One stark example of this potential treatment is the case of our pending Final EIS and Record of Decision for the *Quartzsite Solar Energy Project* which has already been designated as a BLM Priority Project for 2012 in Arizona. *Quartzsite* has undergone various significant processes for NEPA compliance since 2009 and it would be highly inappropriate at this stage to re-subject the project to future Solar PEIS considerations and requirements.

Technology Restrictions

SolarReserve views as inappropriate the proposed restrictions of 10 feet in height and implementation of only solar PV technology in SEZs. Even with current technology, some types of tracking solar PV technology exceed 10 feet in height. Given that SolarReserve's CSP technology requires a roughly 650 feet high tower, this would mean an automatic exclusion in every case. Moreover, as BLM already understands very well, a determination of visual impact is a highly subjective effort that is required to consider a multitude of factors. Therefore, SolarReserve requests the elimination of both height and technology restrictions, and for associated visual impact evaluations to continue to be made on a case-by-case basis so long as the development is not proposed for an area with existing Visual Resource Management Class 1 or 2 designations.

SolarReserve strives to foster continued strong working relationships within every level of the BLM and DOI as well as with our stakeholder partners. Together with our colleagues in the still nascent utility-scale solar industry, we understand the historic nature and significant positive long-term impacts that the Solar PEIS can generate for a meaningful contribution of clean renewable power generation on public land in the United States…if properly implemented with well-considered and balanced input. Please contact me if you have any questions as this PEIS moves toward completion in 2012.

Sincerely,

Andrew Wang
Director, Development
SolarReserve, LLC
(310) 315-2225
Andrew.Wang@SolarReserve.com

Thank you for your comment, Alex Daue.

The comment tracking number that has been assigned to your comment is SEDDsupp20130.

Comment Date: January 27, 2012 15:39:10PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20130

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Attachment: Supplement to Solar DPEIS Comments - Arizona (TWS and partners 1-27-12).pdf

Comment Submitted:

TWS et. al Arizona comments.

January 27, 2012

Delivered via electronic submission to the BLM Solar PEIS website and U.S. mail (with attachments).

Shannon Stewart, BLM Solar PEIS Project Lead
Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue
EVS/240
Argonne, IL 60439

Re: Comments on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (Arizona portion)

Dear Ms. Stewart:

Please accept and fully consider these comments on the Arizona portion of the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (Supplement) on behalf of The Wilderness Society, Sierra Club – Grand Canyon (Arizona) Chapter, Sonoran Institute, Arizona Wilderness Coalition, Defenders of Wildlife, Sky Island Alliance and the Coalition for Sonoran Desert Protection. Please note that these comments are specific to the Arizona portion of the Supplement – some of the signatory groups are also submitting separate comment letters addressing the other states included in the PEIS as well as overarching policy issues.

Overview

We appreciate the overall direction of the Supplement with its additional focus on guiding solar projects to low-conflict Solar Energy Zones (SEZs) in the Modified Solar Energy Development Alternative. The Department of Interior (DOI) and the Bureau of Land Management (BLM) have shown a strong commitment to zone-based development in both the Supplement and in public statements since the publication of the Supplement. We believe that this focus is critical for both the protection of wildlands and wildlife habitat and for meeting our climate and clean energy goals through the success of responsible and well-sited solar development on public lands. **The BLM should continue to refine the Programmatic Environmental Impact Statement (PEIS) through the Final PEIS and Record of Decision (ROD), carrying forward the zone-based focus and most other elements of the Supplement, and sign the ROD by fall 2012.**

We also appreciate that the BLM has addressed many of the specific recommendations we made on the Draft PEIS regarding the Arizona SEZs in the SEZ action plans in the Supplement. Completing the proposed additional analyses, pre-construction surveys, mapping and other reviews identified in the SEZ action plans will be very important for

the success of low-impact solar development in the SEZs, and the BLM should ensure that these efforts are completed prior to development.

Our comment letter addresses several issues, including the following key issues:

- **Exclusion areas:** The Supplement should be strengthened by adding the following lands to the exclusion list: Citizens' Proposed Wilderness areas, BLM-identified lands with wilderness characteristics that are not managed to protect those characteristics, Sonoran desert tortoise management units (Categories I, II and key areas within Category III, as detailed below); lands in Pima County's Conservation Lands System and Preserve System; lands identified in Pinal County's Open Space Plan; lands in modeled multi-species "Arizona Wildlife Linkages"; lands in proposed 2002 cactus ferruginous pygmy owl critical habitat; and lands in the San Pedro-Wilcox Watershed.
- **Changes to SEZs and proposed SEZ action plans:** We support most of the changes to the SEZs and the SEZ action plans that are included in the Supplement. Key recommendations from our comments on the Draft PEIS that still need to be addressed are highlighted in this letter.
- **Coordination with the Restoration Design Energy Project (RDEP):** The BLM should move forward with the RDEP process in a timely manner and provide the identification and analysis of lands that can be utilized for new solar energy zones or as lands suitable for variance projects consistent with the BLM's Solar PEIS.
- **Visual Resource Management in SEZs:** Given the rapidly evolving nature of solar technologies, the BLM should address visual resource impacts on a project-by-project basis in the SEZs, rather than using the proscriptive height and technology restrictions proposed in the Supplement.

I. The BLM should strengthen the exclusion areas in the Final PEIS.

We appreciate the set of exclusion areas included in the Draft PEIS and the Supplement to limit impacts to sensitive natural and cultural resources. The additional exclusion areas added in the Supplement will also help limit impacts and facilitate responsible solar development. **However, the BLM should also exclude the following areas from development[1]:**

- Citizens' Proposed Wilderness Areas: 174,151 acres.[2] We commend the BLM for significantly reducing the number of acres from the 510,888 acres that were proposed to be open for application in the Draft PEIS. However, all Citizens' Proposed Wilderness (CPW) areas should be excluded from development. Examples of areas that have undergone an exhaustive inventory for opportunities of solitude, primitive recreation, naturalness, and other supplemental wilderness values are described below. These areas, among 28 other CPW Areas (see Attachment 1) represent areas where more than 1,000 acres of the area are in

[1] Detailed rationales for excluding these areas from solar development were included in our May 2, 2011 comment letter on the Draft PEIS, and are incorporated here by reference.
[2] A spreadsheet detailing these areas is included as Attachment 1. GIS data for Citizen's Proposed Wilderness areas are included as Attachment 2.

conflict with the Supplement's identified variance application areas. A number of these areas are currently being considered for legislative enactment as wilderness, therefore reducing conflict with future potential solar development is imperative.

- Yellow Medicine Butte: 7,877 acres of conflict (43% of the unit). The Yellow Medicine Butte CPW unit includes a rugged, volcanic mountain surrounded by an unfragmented expanse of the Lower Colorado Subdivision of the Sonoran Desert. Resting between the Eagletail Mountains Wilderness and Woolsey Peak Wilderness that were protected in 1990, this large unit currently hosts one of the most important desert bighorn sheep populations in the vicinity while providing core and connective habitat for other sensitive species. Accessed by the primitive Agua Caliente Road, visitors enjoy a true desert wilderness experience with a high degree of solitude from developed areas to the north and east.
- Cortez Peak: 10,183 acres of conflict (37% of the unit). Cortez Peak CPW consist of a northwest-southeast trending ridge of volcanic mountains, including deep, intertwined canyons that offer topographic screening and premium opportunities for solitude. The influence of humankind is slight given its remote character within the larger Gila Bend Mountains. Similar to Yellow Medicine Butte CPW and other proximate units, the area provides core and connective habitat for sensitive species, as well as premium opportunities for wilderness experiences by those who visit the area. Flat lands within this unit have significant and irreplaceable values.
- Face Mountain: 20,824 acres of conflict (61% of the unit). Face Mountain is the signature geologic feature within this large CPW, including significant flatlands filled with iconic flora and diverse wilderness recreation opportunities. Hidden inner valleys of pristine Sonoran Desert lie in between the ridgelines, offering visitors a unique wilderness experience of naturalness, solitude, and primitive recreation. Developable flatlands in this unit lie in primarily in the northern portion of the unit, which is critical to sustain the viability of wildlife passage through the Gila Bend Mountains.
- East Belmont Mountains: 17,974 acres of conflict (33% of the unit). This unit is exceptional in that it has retained substantial wilderness characteristics despite its proximity to the greater Phoenix metro area. The proposed unit possesses both outstanding opportunities for solitude and primitive/unconfined recreation as visitors are immediately overcome by the topographical and biological variety. This unit provides critical connection to the Hassayampa River to the east and features several large ephemeral washes that supplement the incredible diversity of the area.

- <u>BLM-identified lands with wilderness characteristics not managed to protect those characteristics</u>;
- <u>San Pedro-Wilcox Watershed (USGS Hydrologic Unit Code 150502):</u> 29,917 acres;
- <u>Kaibab-Paunsagunt Wildlife Corridor</u>: In our comments on the Draft Solar PEIS, we recommended that lands in the Kaibab-Paunsagunt Wildlife Corridor be added

to the exclusion list, as utility scale solar development in this important migratory corridor could easily fragment it and disrupt seasonal deer herd movements, which could not only have detrimental impacts to the deer populations that utilize this area heavily, but could also inhibit genetic exchange between them. Unfortunately, the Supplement did not add this biologically important area to the exclusion list. We again reiterate the importance of adding this area to the exclusion list. Specifically, the area in question that should be added to the exclusion list is north of the Kaibab National Forest's northern boundary and east of Kanab Creek. We also note that this corridor extends into southern Utah and the BLM should consult with the Arizona and Utah Game and Fish Departments to ensure that solar development does not impair the functionality of the corridor.

- Pygmy-owl Proposed Critical Habitat (2002)[3]: We are encouraged that the amount of land identified as available for solar development between the Draft Solar PEIS SEDP Alternative and the Supplement's variance application areas located in the 2002 FWS proposed pygmy owl critical habitat was significantly reduced, from approximately 110,775 acres to 7,523 acres. We reiterate the importance of adding the remainder of these lands, crucial to pygmy owl conservation and recovery, to the exclusion list.
- Sonoran desert tortoise habitat: We note that a recent settlement agreement has the Sonoran desert tortoise on track for a listing decision by the US Fish and Wildlife Service in 2015. If listed as threatened or endangered, a critical habitat designation will also be forthcoming. Therefore, lands identified as important habitat for this declining species should not be identified for possible utility scale solar development. We are encouraged that the amount of land identified as suitable for solar development between the Draft Solar PEIS SEDP Alternative and the Supplement's variance application areas conflicting with mapped Sonoran desert tortoise habitat was reduced from approximately 1,188,911 to 880,875 acres, a 26% reduction. However, there is still a high level of conflict with known habitat of this already-declining and reclusive reptile. Potential future solar development in these areas under the Modified SEDP Alternative's variance application areas could encircle, fragment and thus isolate desert tortoise populations – further contributing to their decline. We recommend removing habitat classified by BLM habitat suitability models as Category I "essential" (28,674 acres in conflict) or Category II "may be essential" (301,513 acres in conflict) from further consideration for solar development in order to avert accelerating their decline, and to also remove modeled or otherwise documented tortoise linkages, including areas in Category III habitat, that serve to maintain a connected metapopulation.
- Pinal County Open Space and Trails Master Plan: We appreciate that in the Supplement the BLM has removed a significant area between Interstate 10 and State Highway 79 from further consideration for solar development. In addition to being proposed open space in Pinal County's Open Space Plan, this area also aligns with Unit 4 of the US Fish and Wildlife Service's proposed cactus ferruginous pygmy owl critical habitat. However, all of the other lands identified

[3] A spreadsheet detailing these areas and numerous other sensitive and protected areas described in this section is included as Attachment 3.

in the Draft PEIS continue to be identified as variance application areas in the Supplement, and additional lands were added that also conflict with the open space plan. Additional areas of conflict include:
    - Existing Open Space: 16,058 acres
    - Proposed Open Space: 62,024 acres
    - Proposed Regional Park: 30,044 acres
- Pima County:
    - Sonoran Desert Conservation Plan: As stated on the Sonoran Desert Conservation Plan website, "The Sonoran Desert Conservation Plan is guiding regional efforts to conserve the best lands and most precious resources for future generations of Pima County residents to enjoy. The Plan combines short-term actions with long-range land-use decisions in Pima County, one of the most biologically diverse counties in the U.S. From cactus-studded deserts to conifer forests, the diverse landscape of Pima County is the home to a million residents from diverse ethnic and cultural backgrounds, and contains a rich diversity of plant and animal life."[4] Lands in the county's Maeveen Marie Behan Conservation Lands System and Open Space Preserve system have been identified via the best available science to protect habitat for multiple threatened and endangered species. Areas within the Maeveen Marie Behan Conservation Lands System that should be excluded from solar development:
        - Important Riparian Areas: 426 acres
        - Biological Core Areas: 3,277 acres
        - Special Species Management Areas: 5,350 acres
        - Multiple Use Management Areas: 8,812 acres
        - Open Space Preserve System: 3,533 acres
    - Ranches purchased for conservation purposes: Stemming from its desire to preserve biologically important lands, as well as ranch conservation, Pima County has purchased ranches throughout the county, most of them within the Conservation Lands System. These purchases typically include some private acreage, as well as state and BLM grazing leases. The County has purchased the private acreage as fee simple lands and continues to hold the leases for the grazing rights on state and BLM lands. BLM lands associated with these ranches that should be excluded from solar development include:
        - Rancho Seco: 2,134 acres[5]
        - Diamond Bell Ranch: 473 acres
        - Buckelew Farms: 188 acres
- Arizona Wildlife Linkages: Following an initial workshop at the Phoenix Zoo in April 2004, nine public agencies and nonprofit organizations, including AZGFD, ADOT, FHWA, USFS, BLM, NAU, Sky Island Alliance, and the Wildlands Network initiated a collaborative effort to proactively address wildlife connectivity in Arizona. They identified and mapped large blocks of protected habitat threatened by fragmentation and prioritized areas for further study. Their

[4] Available at: http://www.pima.gov/cmo/sdcp/
[5] Descriptions of Rancho Seco, Diamond Bell Ranch and Buckelew Farms are included as Attachment 4.

report, Arizona's Wildlife Linkages Assessment, can be downloaded from ADOT's website at:
http://www.azdot.gov/inside_adot/OES/AZ_WildLife_Linkages/assessment.asp

Funded by Arizona Game & Fish Department, a team of conservation biologists and GIS Analysts at Northern Arizona University created detailed linkage designs for 16 priority areas highlighted in the Wildlife Linkages Assessment. These plans identified and mapped multi-species corridors that will best maintain wildlife movement between wildland blocks, as well as highlight specific planning and road mitigation measures required to maintain connectivity in these corridors. Among the focal species selected and/or modeled for these linkages include the following BLM sensitive species: Black-footed ferret, Desert bighorn sheep, Hualapai Mexican vole, Jaguar, Arizona chuckwalla, Banded gila monster, Chiricahua leopard frog, Mojave desert tortoise, Rosy boa, Southwestern willow flycatcher, Western burrowing owl, Western yellow-billed cuckoo, Bonytail chub, Desert sucker, Desert pupfish, Gila topminnow, Longfin dace, and Razorback sucker, as well as other wildlife of conservation concern. Shapefiles delineating the spatial extent of these linkages and reports describing them in detail can be downloaded at: http://corridordesign.org/linkages/arizona

By its nature, utility-scale solar development has the potential to fragment and disrupt the functionality of these wildlife linkages. Within the 16 modeled linkages described above, the Draft Solar PEIS SEDP Alternative identified 45,745 acres in conflict. The Supplemental's variance application areas identify 25,834 acres in conflict with these linkages, an encouraging 43.5% decrease in conflict. The linkage reports noted above state,"This Linkage Design Plan is a science-based starting point for conservation actions. The plan can be used as a resource for regional land managers to understand their critical role in sustaining biodiversity and ecosystem processes. Relevant aspects of this plan can be folded into management plans of agencies managing public lands" (Beier et al. 2006-2008). As such, we encourage the BLM to add the remainder of lands in conflict with these linkages to the exclusion list for the Final Solar PEIS. Linkages with variance application areas in conflict include: Mount Perkins – Warm Springs, Hualapai Mtns – Cerbat Mtns, Hualapai – Peacock, Wickenburg – Hassayampa, Gila Bend – Sonoran Desert Monument - Sierra Estrella Mtns, Rincon – Santa Ritas – Whetstones and a small portion of the Tumacacori – Santa Ritas linkage astride Sopori Wash.

Subsequent to the 16 linkage models and reports described above, the AZGFD, in cooperation with county planners, local wildlife experts and non-profit conservation organizations, has been working to further refine wildlife linkage maps and to conduct additional wildlife linkage models in Coconino, Maricopa, Pinal and Pima Counties. We encourage the BLM to

add these linkages to the exclusion list as well. These additional completed linkage models may be made available by request to the AZGFD.

II. Changes to SEZs and SEZ action plans.

In addition to the specific recommendations relating to individual SEZs below, we recommend that the BLM include in the Final PEIS a chart for each of the SEZs that identifies not only the additional data that are needed but who is responsible for compiling the data and completing each item listed, as well as a timetable for completion of the individual tasks.

Brenda SEZ

We are generally supportive of the changes to and proposed action plan for the Brenda SEZ. The proposed mapping and survey efforts will be particularly important for supporting responsible development within the SEZ. Key recommendations from our comments on the Draft PEIS that were not adequately considered and adopted in the Supplement are discussed below.[6] **Provided that BLM completes the proposed action plan prior to development and addresses the recommendations below, we support designation of the proposed Brenda SEZ as a SEZ in the Final PEIS.**

- Avoidance of sensitive washes including Bouse Wash and Tyson Wash: We appreciate that the BLM has identified 31 acres of non-development area within the Bouse Wash on the northeastern corner of the SEZ. We support the additional mapping and survey efforts for washes and riparian areas included in the Supplement. Because of their important ecological function in the Sonoran Desert, the Final PEIS should also specify that washes and riparian areas will be avoided to minimize impacts to wildlife habitat.

Bullard Wash SEZ

We appreciate and support the BLM's removal of the Bullard Wash SEZ from consideration as a SEZ in the Supplement. As detailed in our May 2, 2011 comments, the diverse plant and wildlife community on site and the potential significant impacts on special status species from solar development there make it inappropriate as a SEZ.

The Supplement proposes that Bullard Wash be retained as an area open to variance applications. We recommend that the northern portion of the SEZ be added to the exclusion areas because of the significant sensitive natural resources present there.

Gillespie SEZ

We are generally supportive of the changes to and proposed action plan for the Gillespie SEZ. The proposed mapping and survey efforts will be particularly important for

[6] Detailed rationales for all SEZ-related recommendations were included in our May 2, 2011 comment letter on the Draft PEIS, and are incorporated here by reference.

supporting responsible development within the SEZ. Key recommendations from our comments on the Draft PEIS that were not adequately considered or adopted in the Supplement are discussed below. **Provided that BLM completes the proposed action plan prior to development and addresses the recommendations below, we support designation of the proposed Gillespie SEZ as a SEZ in the Final PEIS.**

- Remove the southern portion of the SEZ: In our comments on the Draft PEIS, we recommended that the portion of the SEZ south of Agua Caliente Road be removed to protect a complicated system of washes and associated wildlife habitat and hydrologic features there. The Supplement does not include this change, so we recommend that this change be made in the Final PEIS in order to assure that the SEZ is strong and solar development is compatible.
- Minimizing impacts to Special Status Species: We support the proposed pre-construction surveys and mapping included in the Supplement, and recommend that impacts be minimized and mitigated at the project-specific level through design and construction changes.

III. Coordination with the Restoration Design Energy Project.

We believe the Restoration Design Energy Project (RDEP) holds great promise for facilitating responsible solar development on BLM lands in Arizona. Lands identified through RDEP's state wide assessment will be used to identify new solar energy zones and serve as lands available for "variance" projects, both of which are consistent with the Supplement to the BLM's Solar PEIS. Our support for this project is predicated on RDEP's intent (to facilitate solar and wind development at multiple scales across federal, state, and private lands) and its approach (focusing on lands previously disturbed, or with limited environmental values, that are close to transmission infrastructure and demand centers).

As we noted in our previous comments on Solar PEIS, it is premature for us to endorse the RDEP (the project has yet to release a draft EIS), though we are encouraged by the following project elements that we believe should be part of any process that the BLM agrees to pursue to identify additional zones in Arizona:

- A focus on disturbed lands that may be suitable for renewably energy development (not limited to solar) at various scales (i.e., utility- and community-scale projects).
- A state-wide-level suitability assessment that includes federal (BLM and US Forest Service), state trust, and private lands and sets the stage for renewable energy development that extends across land ownerships and jurisdictions.
- Extensive consultations with cooperating agencies that result in a more comprehensive inventory of lands with known sensitive resources that are excluded from development.
- The development of a reasonable (renewable energy) development forecast for the next 20 years (measured in gigawatt hours and acres) tied to the state's renewable energy standard and export potential.

- Consideration of the following key factors in the ultimate selection of lands that may be included in the final alternative:
    - proximity to existing and approved transmission corridors,
    - avoidance of areas determined to host significant wilderness, wildlife, and other important environmental values,
    - avoidance of areas identified as essential for wildlife connectivity,
    - impacts on water quality and quantity,
    - proximity to load or demand centers, and
    - opportunities for land tenure adjustments that facilitate protection of lands with high conservation values.
- A pro-active stakeholder engagement and consultation process that includes numerous opportunities for input prior to the release of a draft EIS.
- Provision for appropriate incentives for developers, including the amendment of all affected Resource Management Plans, to propose projects on lands ultimately identified as potentially suitable.

To ensure the BLM moves forward with the RDEP process in a timely manner, and provides the identification and analysis of lands that can be utilized for the identification of new solar energy zones or lands suitable for variance projects consistent with the BLM's Solar PEIS, we offer the following recommendations:

- RDEP's planning outcomes should result in the identification of new solar energy zones or lands suitable for variance projects, based on "landscape-level planning" and "best available science" as outlined in the Solar PEIS.
- The final identification and evaluation of these zones and "variance" lands should happen with due dispatch, no later than the end of 2012.
- A robust suite of incentives are provided for both zones and "Renewable Energy Development Area" lands.
- The AZ BLM Office should be provided the necessary resources to achieve the above recommendations and assure the appropriate level of analysis and public engagement.

IV. Visual resource management in the SEZs.

The Supplement includes restrictions on project height and technology for the Gillespie SEZ to protect visual resources near the SEZ, requiring projects to be lower than 10' and only use PV technology or technology with comparable or lower reflectivity. We support the BLM addressing visual resource impacts from solar development. However, given the rapidly evolving nature of solar technologies, the BLM should not put in place proscriptive height and technology restrictions for applications in the SEZs. Instead, visual resource impacts should be addressed on a project-by-project basis.

V. Cumulative impacts analysis.

The Supplement states that the cumulative impacts analyses included in the Draft PEIS are currently being updated based on changes in the Supplement, and that updated

analyses will be included in the Final PEIS. In order to fully support designation of the SEZs in Arizona, the BLM should ensure completion of robust cumulative impacts analyses and include them in the Final PEIS.

VI. The BLM should provide a 60-day public comment period on the Final PEIS.

There will be a significant amount of new information in the Final PEIS, including updated SEZ-specific design features, SEZ action plans, cumulative impacts analysis and monitoring and adaptive management protocols. For this reason, the BLM should provide a 60-day public comment period on the Final PEIS. While we continue to encourage the BLM to complete the PEIS in a thorough and timely manner, it is very important that the public be able to thoroughly review the Final PEIS and be given the opportunity to provide meaningful input on this new information in order to satisfy the requirements of the National Environmental Policy Act. Further, this comment period should not substantially delay the timeline for completion of the PEIS, because BLM's regulations obligate the BLM to provide a 30-day protest period and a concurrent 60-day governor consistency review of land use plan amendments. 40 C.F.R. §§ 1610.5-2; 1610.5-3. The proposed 60-day public comment period will run during these same timeframes.

Conclusion

We thank DOI and the BLM for proposing an approach to solar energy development on public lands in Arizona that will focus appropriate large-scale solar energy development needed to help alleviate the effects of climate change in low-conflict zones in order to limit environmental impacts. This approach will help ensure that the natural and cultural resources of Arizona are protected for future generations. We look forward to working with the BLM as the agency finalizes the PEIS over the coming months.

Thank you for your thorough consideration of these comments.

Sincerely,

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Attachments:

- Attachment 1 - Overlap of BLM proposed variance application areas and Citizens' Proposed Wilderness Areas
- Attachment 2 - GIS data for Citizens' Proposed Wilderness Areas
- Attachment 3 - Overlap of BLM proposed variance application areas and protected and sensitive areas
- Attachment 4 - Desriptions of Rancho Seco, Diamond Bell Ranch and Buckelew Farms

References:

Beier, P., D. Majka, and T. Bayless. 2006-2008. Arizona Missing Linkages: Reports to Arizona Game and Fish Department. School of Forestry, Northern Arizona University.

Thank you for your comment, Alex Daue.

The comment tracking number that has been assigned to your comment is SEDDsupp20131.

Comment Date: January 27, 2012 15:42:12PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20131

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Attachment: Supplement to Solar DPEIS Comments - Colorado (TWS and partners 1-27-12).pdf

Comment Submitted:

TWS et. al Colorado comments.

January 27, 2012

Delivered via electronic submission to the BLM Solar PEIS website and U.S. mail (with attachments).

Shannon Stewart, BLM Solar PEIS Project Lead
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Re: Comments on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (Colorado portion)

Dear Ms. Stewart:

Please accept and fully consider these comments on the Colorado portion of the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (Supplement) on behalf of The Wilderness Society, Rocky Mountain Wild, Colorado Environmental Coalition, Rocky Mountain Recreation Initiative, Audubon Colorado and High Country Citizens' Alliance. Please note that these comments are specific to the Colorado portion of the Supplement – some of the signatory groups are also submitting separate comment letters addressing the other states included in the PEIS as well as overarching policy issues.

Overview

We appreciate the overall direction of the Supplement with its additional focus on guiding solar projects to low-conflict Solar Energy Zones (SEZs) in the Modified Solar Energy Development Alternative. The Department of Interior (DOI) and the Bureau of Land Management (BLM) have shown a strong commitment to zone-based development in both the Supplement and in public statements since the publication of the Supplement. We believe that this focus is critical for both the protection of wildlands and wildlife habitat and for meeting our climate and clean energy goals through the success of responsible solar development on public lands. **The BLM should continue to refine the Programmatic Environmental Impact Statement (PEIS) through the Final PEIS and Record of Decision (ROD), carrying forward the zone-based focus and most other elements of the Supplement, and sign the ROD by fall 2012.**

We also appreciate that the BLM has addressed many of the specific recommendations we made on the Draft PEIS regarding the Colorado SEZs in the SEZ action plans in the Supplement. Completing the proposed additional analyses, pre-construction surveys, mapping and other reviews identified in the SEZ action plans will be very important for the success of low-impact solar development in the SEZs, and the BLM should ensure that these efforts are completed prior to development.

Our comment letter addresses several issues, including the following key issues:

- **Exclusion areas:** The Supplement should be strengthened by adding Citizens' Proposed Wilderness areas, BLM-identified lands with wilderness characteristics that are not managed to protect those characteristics and the other areas listed below to the exclusion list.
- **Changes to SEZs and proposed SEZ action plans:** We support most of the changes to the SEZs and the SEZ action plans included in the Supplement. Key recommendations from our comments on the Draft PEIS that still need to be addressed are highlighted in this letter.
- **Visual Resource Management in SEZs:** Given the rapidly evolving nature of solar technologies, the BLM should address visual resource impacts on a project-by-project basis in the SEZs, rather than using the proscriptive height and technology restrictions proposed in the Supplement.

I. BLM should strengthen the exclusion areas in the Final PEIS.

We appreciate the set of exclusion areas included in the Draft PEIS and the Supplement to limit impacts to sensitive natural and cultural resources. The additional exclusion areas added in the Supplement will also help limit impacts and facilitate responsible solar development. **However, the BLM should also exclude the following areas from development[1]:**

- Citizens' Proposed Wilderness areas: 2,569 acres[2]
- BLM-identified lands with wilderness characteristics not managed to protect those characteristics
- Sensitive and protected areas (note that these are listed in order of importance)[3]:
    - Roadless areas: 772 acres
    - Areas of Critical Environmental Concern: 503 acres. These areas should have been excluded from development by the exclusion screens included in the Draft PEIS and the Supplement. (Supplement p. 2-16)
    - Colorado Natural Heritage Program Potential Conservation Areas (PCAs): 13,722 acres
    - Colorado Natural Areas Program areas: 230 acres
    - Colorado State Wildlife Areas: 895 acres
    - Land Trust COMaP v8 2010 areas: 35 acres
    - Miscellaneous Protected Areas GAP PAD-US 2010: 22 acres
    - National Monument COMaP v8 2010: 117 acres
    - State Land Board Trust Lands COSLB: 895 acres
    - The Nature Conservancy Land GAP PAD-US 2010: 28 acres
    - Wild Connections Conservation Plan Proposed Wilderness WCCP 2006: 9 acres

[1] Detailed rationales for excluding these areas from solar development were included in our April 18, 2011 comment letter on the Draft PEIS, and are incorporated here by reference.
[2] A spreadsheet detailing these areas is included as Attachment 1. GIS data for these areas are included as Attachment 2.
[3] A spreadsheet detailing these and other sensitive and protected areas is included as Attachment 3.

    - Wildland Network Design Core Conservation Areas SREP: 5,856 acres
- Species-specific conflicts (note that these are listed in order of importance):[4]
    - Gunnison sage-grouse habitat: 18,268 acres. This habitat is the most important habitat for BLM to exclude from solar development.
    - Lynx habitat: 479 acres
    - Cutthroat trout habitat: 787 acres
    - Columbia sharp-tailed grouse habitat: 11 acres
    - Gunnison's prairie dog habitat: 11,807 acres
    - Colorado Natural Heritage Program element occurrences: these element occurrences would not be protected by excluding the PCAs recommended for exclusion above, and should also be specifically excluded.
        - One occurrence of Colorado wild buckwheat (*Eriogonum brandegeei*) is in the Gunnison Basin PCA that intersects a single parcel in the proposed variance application lands.
        - Three occurrences of Degener beardtongue (*Penstemon degeneri*) that intersect 8 parcels in the Solar PEIS. One of the occurrences is in the Wilson Creek PCA which was drawn specifically to protect Degener beardtongue among other things. However the other two occurrences are not within a PCA.
        - One occurrence of Gray's townsend-daisy (*Townsendia glabella*) intersects a single parcel in the Solar PEIS. The Greenie Mountain Foothills PCA is nearby but it does not intersect the parcel and it was not drawn to protect Gray's townsend-daisy.
        - One occurrence of roundtail chub (*Gila robusta*) is in the Dove Creek PCA where the occurrence intersects a single parcel in the Solar PEIS.

II. Changes to SEZs and SEZ action plans.

In addition to the specific recommendations relating to individual SEZs below, we recommend that the BLM include in the Final PEIS a chart for each of the SEZs that identifies not only the additional data that is needed but who is responsible for compiling the data and completing each item listed, as well as a timetable for completion of the individual tasks.

Antonito Southeast SEZ

We are generally supportive of the proposed action plan for the Antonito Southeast SEZ. The proposed mapping and survey efforts will be particularly important for supporting responsible development within the SEZ. Key recommendations from our comments on the Draft PEIS that were not adopted in the Supplement are discussed below.[5] **Provided that BLM completes the proposed action plan prior to development and addresses**

[4] Attachment 3 also details these areas.
[5] Detailed rationales for all SEZ-related recommendations were included in our April 18, 2011 comment letter on the Draft PEIS, and are incorporated here by reference.

the recommendations below, we support designation of the proposed Antonito Southeast SEZ as a SEZ in the Final PEIS.

- Gunnison's prairie dog: We appreciate that BLM has included pre-disturbance surveys and mapping of colonies in the SEZ. The Final PEIS should specify that active colonies will be avoided, and potential offsite mitigation within areas of high species viability should be pursued if significant impacts are expected.
- Elk and pronghorn winter range: We appreciate that BLM has included pre-disturbance surveys to determine habitat use and migration paths. The Final PEIS should specify that movement corridors outside of project footprints will be preserved.

De Tilla Gulch SEZ

We are generally supportive of the changes to and proposed action plan for the De Tilla Gulch SEZ. The proposed mapping and survey efforts will be particularly important for supporting responsible development within the SEZ. Key recommendations from our comments on the Draft PEIS that are not addressed in the Supplement are included below. **Provided that BLM completes the proposed action plan prior to development and addresses the recommendations below, we support designation of the proposed De Tilla Gulch SEZ as a SEZ in the Final PEIS.**

- Gunnison's prairie dog: We appreciate that BLM has adjusted the boundary of the SEZ to avoid the active colony on the northwest side of the SEZ and included pre-disturbance surveys and mapping of colonies in the SEZ. We also support designating the area removed from the SEZ as an exclusion area. The Final PEIS should specify that active colonies will be avoided, and potential offsite mitigation within areas of high species viability should be pursued if significant impacts are expected.
- Elk, mule deer and pronghorn winter range: We appreciate that BLM has included pre-disturbance surveys to determine habitat use and migration paths. The Final PEIS should specify that movement corridors outside of project footprints will be preserved.

Fourmile East SEZ

We are generally supportive of the changes to and proposed action plan for the Fourmile East SEZ, including the boundary adjustment to avoid impacts to the Old Spanish National Historic Trail. In addition, the proposed mapping and survey efforts will be particularly important for supporting responsible development within the SEZ. Key recommendations from our comments on the Draft PEIS that are not addressed in the Supplement are included below. **Provided that BLM completes the proposed action plan prior to development and addresses the recommendations below, we support designation of the proposed Fourmile East SEZ as a SEZ in the Final PEIS.**

- Gunnison's prairie dog: We appreciate that BLM has included pre-disturbance surveys and mapping of colonies in the SEZ. The Final PEIS should specify that active colonies will be avoided, and potential offsite mitigation within areas of high species viability should be pursued if significant impacts are expected.

Los Mogotes East SEZ

We are generally supportive of the changes to and proposed action plan for the Los Mogotes East SEZ. The proposed mapping and survey efforts will be particularly important for supporting responsible development within the SEZ. Key recommendations from our comments on the Draft PEIS that are not addressed in the Supplement are included below. **Provided that BLM completes the proposed action plan prior to development and addresses the recommendations below, we support designation of the proposed Los Mogotes East SEZ as a SEZ in the Final PEIS.**

- Gunnison's prairie dog: We appreciate that BLM has adjusted the boundary of the SEZ to avoid the colony of unknown status on the west side of the SEZ and included pre-disturbance surveys and mapping of colonies in the SEZ. The Final PEIS should specify that active colonies will be avoided, and potential offsite mitigation within areas of high species viability should be pursued if significant impacts are expected.
- Elk, mule deer and pronghorn winter range: We appreciate that BLM has included pre-disturbance surveys to determine habitat use and migration paths. The Final PEIS should specify that movement corridors outside of project footprints will be preserved.

III. Visual resource management in the SEZs.

The Supplement includes restrictions on project height and technology for all four Colorado SEZs to protect visual resources near the SEZs, requiring projects to be lower than 10' and only use PV technology. We support the BLM addressing visual resource impacts from solar development. However, given the rapidly evolving nature of solar technologies, the BLM should not put in place proscriptive height and technology restrictions for applications in the SEZs. Instead, visual resource impacts should be addressed on a project-by-project basis.

IV. Cumulative impacts analysis.

The Supplement states that the cumulative impacts analyses included in the Draft PEIS are currently being updated based on changes in the Supplement, and that updated analyses will be included in the Final PEIS. In order to fully support designation of the SEZs in Colorado, the BLM should ensure completion of robust cumulative impacts analyses and include them in the Final PEIS.

V. The BLM should closely coordinate the PEIS with other BLM planning efforts including the Grand Junction Resource Management Plan revision.

As noted in the Supplement, in addition to the PEIS, the BLM is also undertaking efforts to identify renewable energy priority areas such as new SEZs in other ongoing planning efforts, including the Grand Junction RMP revision currently underway. (Supplement at p. 2-32) The BLM should take advantage of these opportunities to use more localized planning efforts to identify low-conflict priority areas for solar development, and the agency should ensure that these efforts are closely coordinated with the PEIS.

VI. The BLM should provide a 60 day public comment period on the Final PEIS.

There will be a significant amount of new information in the Final PEIS, including updated SEZ-specific design features, SEZ action plans, cumulative impacts analysis and monitoring and adaptive management protocols. For this reason, the BLM should provide a 60 day public comment period on the Final PEIS. While we continue to encourage the BLM to complete the PEIS in a thorough and timely manner, it is very important that the public be given the opportunity to provide meaningful input on this new information in order to satisfy the requirements of the National Environmental Policy Act. Further, this comment period should not substantially delay the timeline for completion of the PEIS, because BLM's regulations obligate the BLM to provide a 30-day protest period and a concurrent 60-day governor consistency review of land use plan amendments. 40 C.F.R. §§ 1610.5-2; 1610.5-3. The proposed 60-day public comment period will run during these same timeframes.

Conclusion

We thank DOI and the BLM for proposing an approach to solar energy development on public lands in Colorado that will focus appropriate large-scale solar energy development needed to help alleviate the effects of climate change in low-conflict zones. This approach will help ensure that the natural and cultural resources of Colorado are protected for future generations. We look forward to working with the BLM as the agency finalizes the PEIS over the coming months.

Thank you for your thorough consideration of these comments.

Sincerely,

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Attachments

- Attachment 1 - Overlap of BLM proposed variance application areas and Citizens' Proposed Wilderness areas
- Attachment 2 – GIS data for Citizens' Proposed Wilderness areas
- Attachment 3 – Overlap of BLM proposed variance application areas and sensitive and protected areas and species habitat

Thank you for your comment, Alex Daue.

The comment tracking number that has been assigned to your comment is SEDDsupp20132.

Comment Date: January 27, 2012 15:44:45PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20132

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Attachment: Supplement to Solar DPEIS Comments - New Mexico (TWS and partners 1-27-12).pdf

Comment Submitted:

TWS et. al New Mexico comments.

January 27, 2012

Delivered via electronic submission to the BLM Solar PEIS website and U.S. mail (with attachments).

Shannon Stewart, BLM Solar PEIS Project Lead
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Re: Comments on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (New Mexico portion)

Dear Ms. Stewart:

Please accept and fully consider these comments on the New Mexico portion of the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (Supplement) on behalf of The Wilderness Society, Defenders of Wildlife, New Mexico Wilderness Alliance and Western Environmental Law Center. Please note that these comments are specific to the New Mexico portion of the Supplement – some of the signatory groups are also submitting separate comment letters addressing the other states included in the PEIS as well as overarching policy issues.

Overview

We appreciate the overall direction of the Supplement with its additional focus on guiding solar projects to low-conflict Solar Energy Zones (SEZs) in the Modified Solar Energy Development Alternative. The Department of Interior (DOI) and the Bureau of Land Management (BLM) have shown a strong commitment to zone-based development in both the Supplement and in public statements since the publication of the Supplement. We believe that this focus is critical for both the protection of wildlands and wildlife habitat and for meeting our climate and clean energy goals through the success of responsible solar development on public lands. **The BLM should continue to refine the Programmatic Environmental Impact Statement (PEIS) through the Final PEIS and Record of Decision (ROD), carrying forward the zone-based focus and most other elements of the Supplement, and sign the ROD by fall 2012.**

We also appreciate that the BLM has addressed many of the specific recommendations we made on the Draft PEIS regarding the New Mexico SEZs in the SEZ action plans in the Supplement. Completing the proposed additional analyses, pre-construction surveys, mapping and other reviews identified in the SEZ action plans will be very important for the success of low-impact solar development in the SEZs, and the BLM should ensure

that these efforts are completed prior to development. There are, however, several important issues raised in our (April 18, 2011) comments on the Draft EIS that were not adequately addressed in the Supplement. Of particular concern is the Supplement's continued inclusion of environmentally sensitive lands as lands open to "variance applications", which we suggested in our comments on the Draft PEIS should be excluded in order to avoid foreseeable conflicts.

Our comment letter addresses several issues, including the following key issues:

- **Exclusion areas:** The Supplement should be strengthened by adding Citizens' Proposed Wilderness areas, BLM-identified lands with wilderness characteristics that are not managed to protect those characteristics, BLM- validated Northern aplomado falcon high and moderately suitable habitats, relict Chihuahuan desert grasslands and lands identified by the BLM as high priorities for grassland restoration to the exclusion list.
- **Changes to SEZs and proposed SEZ action plans:** We support most of the changes to the SEZs and the SEZ action plans included in the Supplement. Key recommendations from our comments on the Draft PEIS that still need to be addressed are highlighted in this letter.
- **Visual Resource Management in SEZs:** Given the rapidly evolving nature of solar technologies, the BLM should address visual resource impacts on a project-by-project basis in the SEZs, rather than using the proscriptive height and technology restrictions proposed in the Supplement.

I. BLM should strengthen the exclusion areas in the Final PEIS.

We appreciate the set of exclusion areas included in the Draft PEIS and the Supplement to limit impacts to sensitive natural and cultural resources. The additional exclusion areas added in the Supplement will also help limit impacts and facilitate responsible solar development. **However, the BLM should also exclude the following areas from development[1]:**

- Citizens' Proposed Wilderness areas: 134 areas with 515,371 acres of overlap.[2] Within these 134 areas, there are 59 Citizens' Proposed Wilderness (CPW) units that have greater than 5,000 acres of variance application areas in conflict and/or have variance application areas that comprise 20% or more of the respective unit. These wilderness quality lands fall within the following complexes: Animas Mountains, Cabezon Country, Cedar Mountains, Continental Divide, Cookes Range, El Malpais, Greater Big Hatches, Greater Bisti/De-Na-Zin, Greater Cerro Pomo, Greater Potrillos, Guadalupe Mountains, Jornada del Muerto, Magdalena Mountains, Nutt Grasslands, Organ Mountains, Peloncillo Mountains, Petaca Pinta Complex, Pyramid Mountains, Quebradas, Robledos – Las Uvas and San Mateo Mountains.

[1] Detailed rationales for excluding these areas from solar development were included in our April 18, 2011 comment letter on the Draft PEIS, and are incorporated here by reference.

[2] A spreadsheet detailing these areas is included as Attachment 1. GIS data for Citizen's Proposed Wilderness areas are included as Attachment 2.

In addition, some of the Citizens' Proposed Wilderness areas with the highest levels of conflict are currently being considered by Congress for designation within the National Wilderness Preservation System. S.1024 has been introduced and referred to Committee, and would protect parts of the Robledos, the Organs, the Potrillos, and the Sierra de las Uvas; all of which could be threatened by development in the PEIS.[3] These areas have long been acknowledged to be of Wilderness quality, a fact that the legislation's existence confirms. We believe the BLM should more carefully consider both Congress's expressed intent and Citizen's Proposed Wilderness, and exclude these areas from solar development.

- BLM-identified lands with wilderness characteristics not managed to protect those characteristics;
- BLM-validated Northern aplomado falcon highly and moderately suitable habitat: 3,809 acres, including 2,513 acres of highly suitable habitat and 1,296 acres of moderately suitable habitat; and
- Lands with relict Chihuahuan desert grasslands or those identified by the BLM as priority areas for grassland restoration.

II. Changes to SEZs and SEZ action plans.

In addition to the specific recommendations relating to the Afton SEZ below, we recommend that the BLM include in the Final PEIS a chart for the Afton SEZ that identifies not only the additional data that is needed but who is responsible for compiling the data and completing each item listed, as well as a timetable for completion of the individual tasks.

Afton SEZ

We are generally supportive of the proposed action plan for the Afton SEZ. The proposed mapping and survey efforts will be particularly important for supporting responsible development within the SEZ. Key recommendations from our comments on the Draft PEIS that were not adopted in the Supplement are discussed below.[4] **Provided that BLM completes the proposed action plan prior to development and addresses the recommendations below, we support designation of the proposed Afton SEZ as a SEZ in the Final PEIS.**

- Minimizing impacts to Special Status Species: While there is likely limited habitat for Special Status Species in the SEZ, the proposed pre-disturbance surveys and mapping efforts in the Supplement will be critical to limiting impacts. Where Special Status Species habitat is found, the Final PEIS should include measures to avoid, minimize and mitigate impacts.

III. Visual resource management in the SEZs.

[3] S. 1024 is included as Attachment 3, and can also be viewed online at http://www.govtrack.us/congress/billtext.xpd?bill=s112-1024

[4] Detailed rationales for all SEZ-related recommendations were included in our April 18, 2011 comment letter on the Draft PEIS, and are incorporated here by reference.

The Supplement includes restrictions on numerous SEZs to protect visual resources near the SEZs, requiring projects to be lower than 10' and only use PV technology. It is not clear in the Supplement what restrictions are proposed for the Afton SEZ. We support the BLM addressing visual resource impacts from solar development. However, given the rapidly evolving nature of solar technologies, the BLM should not put in place proscriptive height and technology restrictions for applications in the SEZs. Instead, visual resource impacts should be addressed on a project-by-project basis.

IV. Cumulative impacts analysis.

The Supplement states that the cumulative impacts analyses included in the Draft PEIS are currently being updated based on changes in the Supplement, and that updated analyses will be included in the Final PEIS. In order to fully support designation of the Afton SEZ in New Mexico, the BLM should ensure completion of a robust cumulative impacts analysis for this SEZ and include it in the Final PEIS.

V. The BLM should provide a 60 day public comment period on the Final PEIS.

There will be a significant amount of new information in the Final PEIS, including updated SEZ-specific design features, SEZ action plans, cumulative impacts analysis and monitoring and adaptive management protocols. For this reason, the BLM should provide a 60 day public comment period on the Final PEIS. While we continue to encourage the BLM to complete the PEIS in a thorough and timely manner, it is very important that the public be given the opportunity to provide meaningful input on this new information in order to satisfy the requirements of the National Environmental Policy Act. Further, this comment period should not substantially delay the timeline for completion of the PEIS, because BLM's regulations obligate the BLM to provide a 30-day protest period and a concurrent 60-day governor consistency review of land use plan amendments. 40 C.F.R. §§ 1610.5-2; 1610.5-3. The proposed 60-day public comment period will run during these same timeframes.

Conclusion

We thank DOI and the BLM for proposing an approach to solar energy development on public lands in New Mexico that will focus appropriate large-scale solar energy development needed to help alleviate the effects of climate change in low-conflict zones. This approach will help ensure that the natural and cultural resources of New Mexico are protected for future generations. We look forward to working with the BLM as the agency finalizes the PEIS over the coming months.

Thank you for your thorough consideration of these comments.

Sincerely,

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Attachments

- Attachment 1 - Overlap of BLM proposed variance application areas and Citizens' Proposed Wilderness areas
- Attachment 2 - GIS data for Citizens' Proposed Wilderness areas
- Attachment 3 - S. 1024

Thank you for your comment, Nancy Karl.

The comment tracking number that has been assigned to your comment is SEDDsupp20133.

Comment Date: January 27, 2012 15:47:01PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20133

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Privacy Preference: Don't withhold name or address from public record
Attachment: MDLT.BLM.PEIS.Comments.Jan2012.pdf

Comment Submitted:

Mojave Desert Land Trust
Preserving land to enjoy forever
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January 26, 2012

Solar Energy Draft PEIS
Argonne National Laboratory
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Argonne, IL 60439

RE: Comments on the Supplement to the Draft Solar Programmatic Environmental Impact Statement

Ladies and Gentleman,

Founded in 2005, Mojave Desert Land Trust (MDLT) is a non-profit 501(c)(3) organization whose mission is to protect the ecosystems, scenic and cultural resources of the California Desert. We accomplish our mission primarily through the acquisition of privately held lands within key conserved areas – Desert National Parks, Desert Wildlife Management Areas, and designated Wilderness areas.

During the last 5 years, MDLT has grown to become a landscape scale conservation partner to the National Park Service (NPS), Bureau of Land Management (BLM), Department of Defense (DOD) and the California Department of Fish & Game.

To date, MDLT has invested more than $18.6 million of private funding to acquire 36,400 acres of land within desert national parks, designated wilderness areas and wildlife linkages. As a major stakeholder of lands within the California desert, we must express our opposition to the Bureau of Land Management's (BLM) Preferred Alternative in the Supplement to the Draft Solar Programmatic Environmental Impact Statement (Supplement) to consider variance lands for utility scale solar development.

MDLT's considerable investment, along with the conveyance to the United States of more than 13,800 acres valued at $6.2 million, has been completed to support and work in concert with the BLM's and National Park Service's protection of wildlife habitat for threatened and endangered species, and to facilitate better management of large conserved areas (DWMA's, national parks and wilderness areas). MDLT has made a significant, positive impact on the checkerboard of inholdings within designated Wilderness Areas within the California Desert Conservation Area that includes Desert Wildlife Management Areas (DWMA), the Mojave National Preserve,

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Joshua Tree National Park and within the linkages that are vital to connecting these ecosystems. *To date, we have acquired more than 840 parcels to stitch these ecosystems back together.*

The BLM's consideration of variance lands for solar energy development beyond the previously defined Solar Energy Zones would have a significant impact on MDLT's conservation investments to date as well as on the wildlife linkages that must be maintained to connect large conserved areas in which we've made these investments.

In addition to our land acquisitions, MDLT has additionally invested in the restoration of thousands of acres of habitat, managing volunteer and paid field experts to conduct thousands of hours of work to ensure these lands are appropriately cleaned up and the habitats are on a path to restoration. The final goal in this effort is to make them suitable for conveyance to the United States and the public, and for their preservation in perpetuity. Large scale solar developments on variance lands would directly impact these investments and their preservation.

We must go on record to strongly oppose the variance lands for consideration in the Supplement. The sacrifice of nearly 1.5 million areas of public recreational lands for the convenience or profit of corporate interests that should be looking to rooftop solar applications or degraded lands for their projects, and allowing significant impacts to the millions of dollars and years of investments by conservation organizations who are good-faith and accountable partners with the BLM and other agencies, would be an unsuitable approach to serving the partnerships and the public who live and work in the California desert.

The Desert Renewable Energy Conservation Plan (DRECP) has undertaken the process by which new solar energy zones, both private and public land, will be identified. Hence, we see no need for a variance process to be a part of the solar energy program to meet renewable energy goals and request this process be dropped from consideration.

Respectfully,

Nancy Karl
Executive Director

Thank you for your comment, Alex Daue.

The comment tracking number that has been assigned to your comment is SEDDsupp20134.

Comment Date: January 27, 2012 15:49:54PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20134

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Attachment: Supplement to Solar DPEIS Comments - Utah (TWS and partners 1-27-12).pdf

Comment Submitted:

TWS et. al Utah comments.

January 27, 2012

Delivered via electronic submission to the BLM Solar PEIS website and U.S. mail (with attachments).

Shannon Stewart, BLM Solar PEIS Project Lead
Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue
EVS/240
Argonne, IL 60439

Re: Comments on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (Utah portion)

Dear Ms. Stewart:

Please accept and fully consider these comments on the Utah portion of the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (Supplement) on behalf of The Wilderness Society, Southern Utah Wilderness Alliance, Wild Utah Project and the Grand Canyon Trust. Please note that these comments are specific to the Utah portion of the Supplement – some of the signatory groups are also submitting separate comment letters addressing the other states included in the PEIS as well as overarching policy issues.

Overview

We appreciate the overall direction of the Supplement with its additional focus on guiding solar projects to low-conflict Solar Energy Zones (SEZs) in the Modified Solar Energy Development Alternative. The Department of Interior (DOI) and the Bureau of Land Management (BLM) have shown a strong commitment to zone-based development in both the Supplement and in public statements since the publication of the Supplement. We believe that this focus is critical for both the protection of wildlands and wildlife habitat and for meeting our climate and clean energy goals through the success of responsible solar development on public lands. **The BLM should continue to refine the Programmatic Environmental Impact Statement (PEIS) through the Final PEIS and Record of Decision (ROD), carrying forward the zone-based focus and most other elements of the Supplement, and sign the ROD by fall 2012.**

We also appreciate that the BLM has addressed many of the specific recommendations we made on the Draft PEIS regarding the Utah SEZs in the SEZ action plans in the Supplement. Completing the proposed additional analyses, pre-construction surveys, mapping and other reviews identified in the SEZ action plans will be very important for the success of low-impact solar development in the SEZs, and the BLM should ensure that these efforts are completed prior to development.

Our comment letter addresses several issues, including the following key issues:

- **Exclusion areas:** The Supplement should be strengthened by adding Citizens' Proposed Wilderness areas, BLM-identified lands with wilderness characteristics that are not managed to protect those characteristics, Greater sage-grouse habitat and the other areas listed below to the exclusion list.
- **Changes to SEZs and proposed SEZ action plans:** We support most of the changes to the SEZs and the SEZ action plans included in the Supplement. Key recommendations from our comments on the Draft PEIS that still need to be addressed are highlighted in this letter.

I. BLM should strengthen the exclusion areas in the Final PEIS.

We appreciate the set of exclusion areas included in the Draft PEIS and the Supplement to limit impacts to sensitive natural and cultural resources. The additional exclusion areas added in the Supplement will also help limit impacts and facilitate responsible solar development. **However, the BLM should also exclude the following areas from development[1]:**

- Citizens' Proposed Wilderness areas: lands proposed in the Supplement to be open to variance applications overlap with 116 units totaling 436,439 acres.[2] The examples of units with overlap with lands proposed to be open to variance applications described below underscore the importance of excluding all Citizens' Proposed Wilderness areas:

  Tule Valley and Tule Valley South proposed wilderness units: The Tule Valley and Tule Valley South proposed wilderness units make up one of Utah's few remaining intact basins in the state's west desert and "basin and range" complex. Today, Tule Valley is much the same as it has been for centuries, a remote and untrammeled basin pockmarked with hot springs, significant cultural sites, and home to *Rana pretiosa* (spotted frog) – a state sensitive species. The area is bounded by a few dirt roads but otherwise there are few signs of current human activity.

  Dirty Devil proposed wilderness unit: The Dirty Devil proposed wilderness unit is one of the west's most iconic landscapes with its incised redrock canyons, fantastic views, and unique history (Billy the Kid and his gang escaped into the Dirty Devil complex on several occasions to evade detection). On certain years, at peak runoff, river runners flock to the Dirty Devil river to run this remote and wild river. The proposed wilderness unit is also prized for its canyoneering, remote camping, and untrammeled vistas. BLM has confirmed on multiple occasions that this area has wilderness characteristics.

[1]Detailed rationales for excluding these areas from solar development were included in our April 18, 2011 comment letter on the Draft PEIS, and are incorporated here by reference.

[2]A spreadsheet detailing these areas is included as Attachment 1. Note that there may be other conflicts not identified in this analysis – due to limitations in accuracy of the available GIS data, we have excluded any areas smaller than one acre. GIS data for Citizens' Proposed Wilderness areas are included as Attachment 2.

Flat Tops proposed wilderness unit: The Flat Tops proposed wilderness unit is located just north of and forms a natural extension to the Dirty Devil proposed wilderness unit. However, unlike the Dirty Devil region, the Flat Tops consist of two significant mesas and surrounding undisturbed deserts and vegetated sand dunes. The area lies just east of Utah's famed Goblin Valley state park and Temple Mountain and west of the Maze District of Canyonlands National Park. BLM has confirmed on multiple occasions that this area has wilderness characteristics.

Mount Ellen proposed wilderness unit: The Mount Ellen proposed wilderness unit is contiguous to and an extension of the Mount Ellen- Blue Hills Wilderness Study Area (WSA). The unit's diverse terrain, steep slopes, isolated basins, dense forest, and barren alpine ridge tops all contribute to provide outstanding opportunities for solitude and primitive and unconfined recreation. Visitors come to this unit to experience solitude, enjoy the vistas into nearby Capitol Reef National Park, and catch sight of and enjoy viewing the largest free-roaming bison herd in Utah. The area is also popular with bison hunters. BLM has confirmed on multiple occasions that this area has wilderness characteristics.

Mount Pennell proposed wilderness unit: The Mount Pennell proposed wilderness unit is a diverse combination of high-elevation piñon and juniper woodlands, incised sandstone canyons, expansive mesas, colorful badlands, and rugged benchlands, providing outstanding opportunities for both solitude and primitive and unconfined recreation. There are extensive opportunities for such dispersed, undeveloped recreation activities as hunting, wildlife observation, photography, nature study, camping, and hiking. Extensive scenic vistas, rugged canyons, stark badlands, rolling and broken benchlands, and wooded high country combine to provide an ideal setting for visitors to experience primitive, unconfined recreation.

The combination of badlands, mesas, and canyons offer an impressive landscape of geologic diversity, linking the Henry Mountains with the Waterpocket Fold area. The bison herd in the Henry Mountains is one of the few free-roaming herds in the nation. The badlands and benchlands also provide habitat for the endangered Wright's fishhook cactus and a number of other candidate plant species.

See Utah Wilderness Inventory, 72 (1999). BLM has confirmed on multiple occasions that this area has wilderness characteristics.

Painted Rock proposed wilderness unit: Located in western Utah's basin and range country, the Painted Rock proposed wilderness unit consists of a horseshoe shaped mountain complex with notable different hues. The unit is extremely remote and connects visitors with the King

Top wilderness study area and Crystal Peak Area of Critical Environmental Concern (ACEC) and northern WahWah Mountains.

Nokai Dome proposed wilderness unit: All three of the large and remote Nokai Dome inventory units retain their generally natural appearance and have wilderness characteristics. Unit 3, with its series of major canyons, colorful badlands, and impressive 1,000-foot cliffs, provides outstanding opportunities for solitude and primitive and unconfined recreation. All of the units provide outstanding opportunities for solitude and primitive and unconfined recreation, either on their own or when considered in conjunction with the contiguous portion of the Glen Canyon National Recreation Area (NRA) that has been proposed for wilderness. BLM has confirmed that this area has wilderness characteristics.

Red Rock Plateau proposed wilderness unit: The eastern edge of the Red Rock Plateau and Copper Point proposed wilderness units are most often viewed by travelers as they drive the Highway 95 Bicentennial Scenic Byway, between the Glen Canyon National Recreation Area and Natural Bridges National Monument, which recognizes the area‘s outstanding natural beauty as well as its historic, cultural and recreational importance.

The crown jewel of this wilderness is the expansive Mancos Mesa, which is dissected east to west by the 20-mile long Moqui Canyon. Mancos Mesa‘s 180-square mile mesa top, bounded on every side by 1,000- to 1,500-foot-high cliffs, is the largest isolated slickrock mesa in southern Utah. Navajo Sandstone dominates the westward-sloping mesa, with elevations ranging from nearly 7,000 feet to 4,500 feet. Expanses of slickrock domes in shades of vermillion intermingle with sand dunes vegetated with ancient juniper trees, sagebrush, Mormon tea, and Indian ricegrass. Cottonwood trees and riparian vegetation can be found tucked away in canyons, fed by natural seeps and springs. Highly eroded and multi-hued badlands found beneath the rim complete the diversity of this outstanding wilderness. The Redrock Plateau and Copper Point proposed wilderness units also shelters extensive archaeological remains spanning thousands of years of prehistory and several different cultures. BLM has confirmed that this area has wilderness characteristics.

WahWah Mountains (North, Central and South) proposed wilderness units: The WahWah Mountains provide beautiful views of rugged mountain topography. There are spectacular scenic vistas in all directions from the higher elevations. Vegetation types transition from cold desert vegetation to ponderosa pine forests. This varied vegetation provides habitat for pronghorn antelope, mule deer, a variety of birds, small mammals, and reptiles. The North WahWah Mountains proposed wilderness unit extends the outstanding opportunities for solitude and

primitive recreation found within the contiguous WahWah Mountains Wilderness Study Area (WSA). The WSA's values include Crystal Peak, a mountain of white volcanic tuff visible for 50 miles; bristlecone pine, which grows in the higher portions of the WSA; and endangered, threatened, or candidate animal species. BLM has confirmed that much of this area has wilderness characteristics.

Snake Valley proposed wilderness unit: The Utah Wilderness Coalition Snake Valley proposed wilderness unit is located north of Utah State Highway 50, in far-western Utah, and is entirely within Millard County and adjacent to the community of Gandy. Great Basin National Park is roughly 20 miles from this proposed wilderness unit and can easily be viewed from within the unit. This proposed wilderness unit and the larger Snake Valley are unique and diverse, and are one of the last wild basin valleys within the "Basin and Range" topography in the state of Utah.

Particularly striking natural features of this remarkable landscape include vast expanses of desert washes and vegetation, a large lake in wetter periods and a shimmering white playa flat in drier times, expanses of large vegetated dunes and dune systems, and an exceptionally rare and productive wetland and marsh area that is dotted by several large ponds. These marsh and wetland areas are highly unique and provide visual contrast within this desert basin; they are rare ecosystems in western Utah. Foote Spring and Twin Springs feed the stream that flows through these marshes and the wetland area. Not only are these wetlands extremely beautiful in this desert area of the basin and range landscape, they also provide crucial habitat for many Utah state sensitive species, including the least chub and spotted frog.

- <u>BLM-identified lands with wilderness characteristics not managed to protect those characteristics;</u>
- <u>Potential Areas of Critical Environmental Concern (ACECs):</u> these areas were found to meet the relevance and importance criteria in recent Resource Management Plan revisions but were not designated or only had portions of the full area meeting the relevance and importance criteria designated;
    - Moab Field Office: Bookcliffs Wildlife Area – 5 acres;
    - Richfield Field Office: 5 areas totaling 20,228 acres;
        - Badlands: 1,692 acres
        - Dirty Devil/North Wash: 606 acres
        - Kingston Canyon: 94 acres
        - Lower Muddy Creek: 31 acres
        - Henry Mountains: 17,804 acres

            Henry Mountains Scenic and Wildlife Potential ACEC: The Richfield ARMP and ROD acknowledged that the Henry Mountains Scenic and Wildlife Potential ACEC offers several relevant and important values, including: scenic, wildlife, special status species, and ecological

values. In deciding not the designate this area as an ACEC, the Richfield ARMP and ROD states that these values will be protected through other means such as VRM II, limiting ORV use to designated trails, wildlife protective stipulations, and Special Recreation Management Area designations. In several instances BLM relies on implementation plans to provide additional, specific protection measures, however those plans have yet to be written or even initiated. Thus we urge BLM to defer making lands within this potential ACEC available for solar applications until these additional planning efforts have been completed to ensure that these resources are given the full protections envisioned by the ROD.

- Wild and Scenic River segments: These segments were determined eligible for Wild and Scenic River status by the Monticello field office but were not carried forward for a suitability determination.
    - Monticello Field Office:
        - White Canyon: 3170ft. BLM's Monticello field office identified White Canyon as eligible for designation under the Wild and Scenic Rivers Act as a "scenic" river, citing it's scenic and recreation 'outstandingly remarkable values.'
        - Lime Creek: 4363 ft. BLM's Monticello field office identified Lime Creek as eligible for designation under the Wild and Scenic Rivers Act as a "scenic" river, citing its cultural and recreation 'outstandingly remarkable values.'
        - Comb Wash: 1077 ft. BLM's Monticello field office identified Comb Wash as eligible for designation under the Wild and Scenic Rivers Act as a "recreational" river, citing its cultural 'outstandingly remarkable values.'
- Greater sage-grouse habitat: the Supplement states that "To meet the objectives of BLM's sage-grouse conservation policy, the Solar PEIS has excluded specifically identified sage-grouse habitat (currently occupied, brooding, and winter habitat) located on BLM public lands in Nevada and Utah". (Supplement at p. 2-18). We appreciate that BLM has added this important exclusion area to protect the Greater sage-grouse. However, the lands proposed to be open for variance applications in the Supplement include substantial acreage of Greater sage-grouse habitat, which should be excluded from development. Specifically, remaining occupied habitat and 75% and 100% breeding densities should all be excluded in Utah given the small number of birds in the state. Acres of overlap with Greater sage-grouse habitat proposed to be open for variance applications in the Supplement are:
    - Occupied habitat: 9,141 acres[3]
    - 75% breeding density: 9,682 acres[4]

[3] Data source: Utah Division of Wildlife Resources, available at: http://dwrcdc.nr.utah.gov/ucdc/downloadgis/Data/Habitat/Birds/GreaterSG2011.zip

- 100% breeding density: 61,600 acres
- Additional wildlife analyses the BLM should use to determine areas open for variance applications: we have attached additional wildlife analyses completed by Wild Utah Project that BLM should use in determining areas open for variance applications and required design features for project applications in sensitive wildlife habitat areas. *See* Attachment 3.

II. Changes to SEZs and SEZ action plans.

In addition to the specific recommendations relating to the Utah SEZs below, we recommend that the BLM include in the Final PEIS a chart for the SEZ that identifies not only the additional data that is needed but who is responsible for compiling the data and completing each item listed, as well as a timetable for completion of the individual tasks.

Escalante Valley SEZ

We are generally supportive of the proposed action plan for the Escalante Valley SEZ. The proposed mapping and survey efforts will be particularly important for supporting responsible development within the SEZ. Key recommendations from our comments on the Draft PEIS that were not adopted in the Supplement are discussed below.[5] **Provided that BLM completes the proposed action plan prior to development and addresses the recommendations below, we support designation of the proposed Escalante Valley SEZ as a SEZ in the Final PEIS.**

- Minimizing impacts to Special Status Species: We appreciate the BLM identifying a non-development area in the southwest corner of the SEZ to avoid impacts to the dry lakebed there. We also support the pre-disturbance surveys identified in the Supplement. Where Special Status Species habitat is found, the Final PEIS should include measures to avoid, minimize and mitigate impacts.
- Minimizing impacts related to vegetation removal, soil disturbance and dust: We support the habitat and vegetation mapping efforts identified in the Supplement, and recommend that additional specific design features be included in the Final PEIS to minimize impacts.
- Ecological reference area: As stated in our April 18, 2011 comments on the Draft PEIS, we recommend that BLM identify a 1,000 hectare ecological reference area as part of the SEZ to provide a control area for researching impacts of utility-scale solar development and inform future efforts to minimize and mitigate impacts.

Milford Flats South SEZ

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[4] Data source for 75% and 100% breeding densities: Doherty, K. E., J. D. Tack, J. S. Evans, D. E. Naugle. 2010b. Mapping Breeding Densities of Greater Sage-grouse: A Tool for Range-wide Conservation Planning. Prepared for Bureau of Land Management. BLM Completion Report: Inter Agency Agreement #L10PG00911. (Sep. 24, 2010).

[5] Detailed rationales for all SEZ-related recommendations were included in our April 18, 2011 comment letter on the Draft PEIS, and are incorporated here by reference.

We are generally supportive of the proposed action plan for the Milford Flats South SEZ. The proposed mapping and survey efforts will be particularly important for supporting responsible development within the SEZ. Key recommendations from our comments on the Draft PEIS that were not adopted in the Supplement are discussed below. **Provided that BLM completes the proposed action plan prior to development and addresses the recommendations below, we support designation of the proposed Milford Flats South SEZ as a SEZ in the Final PEIS.**

- Minimizing impacts to Special Status Species: We appreciate the BLM identifying a non-development area composing the Minersville Canal, which will avoid impacts to species with habitat along the canal. We also support the pre-disturbance surveys identified in the Supplement, as well as the proposed mapping of playa habitat, woodland habitat, and rocky cliffs and outcrops, which are all habitat types that may contain Special Status Species. Given the potential for Special Status Species habitat within these habitat types, these areas should be avoided. Where Special Status Species habitat is found, the Final PEIS should include measures to avoid, minimize and mitigate impacts.
- Minimizing impacts related to vegetation removal, soil disturbance and dust: We support the habitat and vegetation mapping efforts identified in the Supplement, and recommend that additional specific design features be included in the Final PEIS to minimize impacts.
- Ecological reference area: As stated in our April 18, 2011 comments on the Draft PEIS, we recommend that BLM identify a 1,000 hectare ecological reference area as part of the SEZ to provide a control area for researching impacts of utility-scale solar development and inform future efforts to minimize and mitigate impacts.

WahWah Valley SEZ

As detailed in our April 18, 2011 comments on the Draft PEIS, the remote nature of the WahWah Valley SEZ and the lack of an underlying Resource Management Plan (RMP) for the area make it the least appropriate of the proposed Utah SEZs. **For these reasons, we recommend that the BLM prioritize the designation of the Milford Flats South and Escalante Valley SEZs and de-prioritize the designation of the WahWah Valley SEZ until an RMP is completed for the area.**

Though we recommend that this SEZ be de-prioritized until completion of an RMP for the area, we are generally supportive of the proposed action plan for the WahWah Valley SEZ. The proposed mapping and survey efforts will be particularly important for supporting responsible development within the SEZ. Key recommendations from our comments on the Draft PEIS that were not adopted in the Supplement are discussed below.

- Minimizing impacts to Special Status Species: We appreciate the BLM identifying a non-development area along WahWah Wash, which will avoid impacts to species with habitat along the wash. We also support the pre-disturbance surveys identified in the Supplement, as well as the proposed

mapping of dry wash, playa, and greasewood flat habitats, which are all habitat types that may contain Special Status Species. Where Special Status Species habitat is found, the Final PEIS should include measures to avoid, minimize and mitigate impacts.

- Ecological reference area: As stated in our April 18, 2011 comments on the Draft PEIS, we recommend that BLM identify a 1,000 hectare ecological reference area as part of the SEZ to provide a control area for researching impacts of utility-scale solar development and inform future efforts to minimize and mitigate impacts.

III. Cumulative impacts analysis.

The Supplement states that the cumulative impacts analyses included in the Draft PEIS are currently being updated based on changes in the Supplement, and that updated analyses will be included in the Final PEIS. In order to fully support designation of the SEZs in Utah, the BLM should ensure completion of robust cumulative impacts analyses and include them in the Final PEIS.

IV. The BLM should provide a 60 day public comment period on the Final PEIS.

There will be a significant amount of new information in the Final PEIS, including updated SEZ-specific design features, SEZ action plans, cumulative impacts analysis and monitoring and adaptive management protocols. For this reason, the BLM should provide a 60 day public comment period on the Final PEIS. While we continue to encourage the BLM to complete the PEIS in a thorough and timely manner, it is very important that the public be given the opportunity to provide meaningful input on this new information in order to satisfy the requirements of the National Environmental Policy Act. Further, this comment period should not substantially delay the timeline for completion of the PEIS, because BLM's regulations obligate the BLM to provide a 30-day protest period and a concurrent 60-day governor consistency review of land use plan amendments. 40 C.F.R. §§ 1610.5-2; 1610.5-3.The proposed 60-day public comment period will run during these same timeframes.

Conclusion

We thank DOI and the BLM for proposing an approach to solar energy development on public lands in Utah that will focus appropriate large-scale solar energy development needed to help alleviate the effects of climate change in low-conflict zones. This approach will help ensure that the natural and cultural resources of Utah are protected for future generations. We look forward to working with the BLM as the agency finalizes the PEIS over the coming months.

Thank you for your thorough consideration of these comments.

Sincerely,

Alex Daue, Renewable Energy Associate
The Wilderness Society
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Attachments

- Attachment 1 - Overlap of BLM proposed variance application areas and Citizens' Proposed Wilderness units
- Attachment 2: GIS data for Citizens' Proposed Wilderness units
- Attachment 3: Wild Utah Project wildlife habitat analysis and recommendations

Thank you for your comment, Erin Lieberman.

The comment tracking number that has been assigned to your comment is SEDDsupp20135.

Comment Date: January 27, 2012 15:52:57PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20135

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Attachment: 012712_DoW_Solar_Comments.xlsx.xlsx

Comment Submitted:

Friday, January 27, 2012

Draft Solar Energy Programmatic EIS
Argonne National Laboratory
9700 S. Cass Avenue – EVS/240
Argonne, IL 60439

To Whom It May Concern:

Please find attached more than 35,000 comments from Defenders of Wildlife supporters regarding the Bureau of Land Management and Department of Energy's Supplement to the Draft Solar Programmatic Environmental Impact Statement (BLM/DES 11–49, DOE/EIS–0403D–S). Many of these individuals signed on to a version of the text below, however some chose to personalize their comments.

As a supporter of Defenders of Wildlife and someone who wishes to make solar energy development in the U.S. "smart from the start," I encourage you to strengthen protections for wildlife and natural resources in the Draft Solar PEIS.

First, I commend you for putting a stronger emphasis on solar energy zones--areas identified with few if any wildlife and natural resource conflicts. I encourage you to ensure that projects located in solar energy zones will be prioritized for development.

Although the Bureau of Land Management did the right thing by removing some highly sensitive areas from further consideration as zones (the Pisgah and Iron Mountain Zones in California), the agency has left open the possibility that solar development on some of these lands might still occur through the "variance process."

But variances should be extremely limited so that they are only used in rare instances where the conservation benefits are clear and can be documented. Variances should be the exception, not the rule.

To protect imperiled species like desert tortoises and bighorn sheep, the agency should exclude areas that have already been deemed unsuitable because of likely wildlife and resource conflicts.

America's degraded lands, like brownfields and old mining sites are not now included in most solar zones. They should be. Such areas are appropriate additional lands that should be available for development.

By developing degraded areas such as these -- rather than more sensitive and ecologically rich sites -- we can preserve important wildlife habitat and protect valuable natural resources.

America is transitioning from a society reliant on fossil fuels to one built on clean, renewable energy. But to make sure this is truly widllife-friendly energy development, we must make sure the process is smart from the start by:

1. Supporting solar development in designated solar energy zones--areas where conflicts with wildlife and other important natural resources can be avoided or minimized;
2. Limiting variances for projects outside of zones. Make them the exception, not the rule; and
3. Requiring developers to avoid, minimize and effectively mitigate any unavoidable effects on wildlife by promoting "wildlife-friendly" solar development.

I believe the changes listed above will greatly enhance your proposal and better protect America's rich natural heritage. Thank you for considering my comments.

Please accept these individuals' comments with regard to the U.S. Fish and Wildlife Service's proposed plan and our thanks for your agency's collaboration in ensuring that the voices of these concerned citizens are heard.

Sincerely,

Jim Lyons
Senior Director, Renewable Energy
Defenders of Wildlife
Phone: 202-772-3202
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Thank you for your comment, Patrick Donnelly-Shores.

The comment tracking number that has been assigned to your comment is SEDDsupp20110.

Comment Date: January 27, 2012 11:22:11AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20110

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Attachment:

Comment Submitted:

This is an addendum to the paper I submitted as my comment to the original Draft PEIS, summarizing a critique of the Supplement. In summary: the SEZPA is the correct one to adopt. Especially given the flexibility built in by the potential of adopting new SEZs, there is no reason to chose the SEDPA. Please do not.

The Supplement shows BLM clearly responding to the huge outpouring of interest from the public to the PEIS. However, it isn't clear that truly substantive changes were made to the PEIS as a whole. Some of the most politically troublesome lands were eliminated from consideration, be they SEZs in particularly vulnerable or remote areas, or SEDPA lands which were the most sensitive and had attracted the most attention. And certain procedures such as Variances and SEZ-identification were enhanced, if for no other reason than to clarify National BLM priorities to a disparate group of state offices.
Despite these improvements, however, BLM still kept the SEDPA as its preferred alternative, declaring over 20 million acres of Public Land open to solar development, against the wishes of almost every commenter at the Sacramento public meeting referenced above, and at other public meetings, transcripts of which were made available on the Solar PEIS website. Estimates in the PEIS indicate that more than enough capacity would be available within the SEZs to meet the RFDS. It remains unclear as to why BLM continues to prefer the SEDPA, given the flexibility that has been built into the PEIS, and the fact that the document is not the exclusive authority governing the permitting of solar projects.

Thank you for your comment, Nada Culver.

The comment tracking number that has been assigned to your comment is SEDDsupp20111.

Comment Date: January 27, 2012 11:26:35AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20111

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Privacy Preference: Don't withhold name or address from public record
Attachment: TWS et al Comments on Supplement to Solar DPEIS 1-17-12.pdf

Comment Submitted:

This is the second of our two submissions. Thank you for your consideration.

January 27, 2012

Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue
EVS/240
Argonne, IL 60439

Re: Comments on Supplement to Draft Solar PEIS

To Whom It May Concern:

Please accept these comments on the Supplement to the Draft Solar Programmatic Environmental Impact Statement (PEIS). We appreciate the Bureau of Land Management providing this additional information and an opportunity for public comment.

At the outset, we want to express our appreciation that the Supplement includes: (1) a revised preferred alternative that is zone-based and sets out a more comprehensive program; (2) a commitment to completing the PEIS in 2012; and (3) an acknowledgment of BLM's and the Department of Interior's authority and discretion to deny applications for rights-of-way on the public lands. We believe these elements will help the Department implement a responsible solar energy program in a timely manner.

The detailed comments set out below represent our best effort to improve the proposed framework in the Draft PEIS and Supplement, as well as to support generation of solar energy in the right places on the public lands.

BLM should add critical exclusion areas in the Final PEIS.

We appreciate the set of proposed exclusion areas set out in the Draft PEIS and the Supplement that will limit impacts to sensitive natural and cultural resources; clear exclusion areas are a key element of avoiding and reducing both environmental consequences and opposition. The additional exclusion areas included in the Supplement will further help limit impacts and controversy, and facilitate responsible solar development. **However, the list of exclusion areas (Table 2.2-1) should be modified to include additional sensitive resources, especially citizen-proposed wilderness and all BLM-identified lands with wilderness characteristics, including those that the BLM is not currently managing to protect those characteristics.** BLM's current guidance on inventory and management of lands with wilderness characteristics, Instruction Memorandum (IM) 2011-154, reiterates the agency's obligations under FLPMA "to conduct and maintain inventories" and "to consider identified lands with wilderness characteristics in land use plans and when analyzing project-specific solar applications under the National Environmental Policy Act," as well as providing guidance on considering alternatives to protect wilderness characteristics. IM 2011-154

was issued in July, 2011, after issuance of the Draft PEIS. The Final PEIS should both exclude these areas and acknowledge the new guidance.[1]

The Final PEIS should also include **desert tortoise connectivity areas[2], BLM Sonoran desert tortoise Category I and Category II management units[3] and Habitat Management Areas** (also referred to as Wildlife Habitat Management Areas) in the list of areas excluded from development and incorporate additional sensitive resources in the specific to states in the exclusion areas, such as those found in parts of the California Desert Conservation Area. These resources are identified and discussed in detail in separate, state-specific comments being submitted on the Supplement by some of our organizations. We also note that the BLM should incorporate data generated through the various interagency state and regional Crucial Habitat Assessment Tool development processes that are being managed by the Western Governors Association, which will assist in identifying crucial habitat and wildlife corridors, both of which are subject to protection under this PEIS[4].

Program and policy elements should be explicitly incorporated into RMP Amendments through the Solar PEIS ROD.

We appreciate that Appendix E to the Supplement reiterates that land use plans will be amended to identify exclusion areas, SEZs, and variance areas, and will also incorporate design features that mitigate impacts on environmental and cultural resources. We also support the agency's commitment to evaluating land use plans currently undergoing revision or amendment to address inconsistencies with the Solar PEIS. Pursuant to BLM's Land Use Planning Handbook, amendments are appropriate for incorporating new or revised policies that change terms, conditions or decisions from the existing plan. H-1601-1.VII.B.

In the Solar PEIS ROD, BLM should fully incorporate the changes in land use allocations and terms for approving solar energy development into the amendments, so that the **land use plan amendments include**:

- Language of the current instruction memoranda, especially those issued in fiscal year 2011 IMs; and

[1] Additional detailed rationales for excluding these areas from solar development and maps and GIS data of their locations were included in our May 1, 2011 comment letter on the Draft PEIS, and are incorporated herein by reference.

[2] The BLM's proposed connectivity habitats shown on Figure 2.2-2 (SPEIS at p. 2-36) should be replaced with the connectivity (or "linkage") habitats recommended by the FWS in its comments on the Draft PEIS. See comments of U.S. Fish and Wildlife Service, Draft PEIS, May 6, 2011, Figure B-2. It is important to understand that agency's recommendations identified lands to be included in a "…*minimum linkage design necessary for the conservation and recovery of the Mojave population of the desert tortoise*…" FWS DPEIS comments, Figure B-2 (emphasis added).

[3] Identified in: Bureau of Land Management. 1990. Strategy for desert tortoise habitat management on public lands in Arizona. Arizona State Office, Bureau of Land Management, Department of the Interior.

[4] *See also* Instruction Memorandum No. 2012-039, which instructs land managers to use prioritized wildlife and habitat information and data developed through state- and regional-level CHATs as a principal source to inform land use planning, as well as related natural resource decisions on public lands.

- The policy elements discussed in Appendix III to our comments on the Draft PEIS.[5]

BLM should not rely on IMs to implement policy, since IMs are explicitly intended to be temporary and do not clearly amend the terms of all RMPs, but rather should fully incorporate terms for approving solar energy development into land use plans through amendments.

In addition, the Solar PEIS ROD should incorporate a **process for updating affected plans through ongoing amendments and issuing interim guidance** pending completion of those amendments, including:

- Clarifying current statements in the Supplement that the BLM will continue to refine exclusions (*See*, Supplement, p. 2-13, noting that modifications to exclusion areas will result from adaptive management and monitoring and be incorporated into the Solar Energy Program) and that additions to exclusion categories can be made by state and field offices (Supplement, Table 2.2-1, Item #29, p. 2-17). The Final PEIS should provide that changes or additions to exclusion areas will be evaluated and incorporated through amendments to applicable land use plans instead of the general references to "appropriate" processes (Supplement, p. 2-13); and
- Identifying specific policies expected to be developed and describing the anticipated path forward for incorporating these into affected land use plans (again, the agency should not rely on IMs as a long-term source for guidance).

Requirements for ongoing and project-specific NEPA analysis should be elaborated.

The NEPA analysis set out in the Draft Solar PEIS regarding cumulative and landscape-level impacts, mitigation measures, changes to design features, and further assessment of SEZs, including natural and cultural resources, visual impacts, water use and transmission, has generally not been expanded in the Supplement. Appendix J has been expanded to include analysis of impacts on special status species that was conducted for the land within SEZs in the Draft PEIS, which will provide better information for tiering as this data is incorporated into the additional analyses deferred to the Final PEIS. As discussed in detail in Section II.A of our comments on the Draft Solar PEIS (incorporated herein by reference), the NEPA analysis conducted to date will support important elements of the BLM's solar energy development program as set out in the Draft PEIS and Supplement, including tiering to analysis from the PEIS and shorter timeframes for processing applications in SEZs.

Nonetheless, additional analysis is needed to successfully implement the program and approve individual project-specific solar applications. Based on information presented in the Supplement, we have concerns with seeming disincentives for completing project-specific environmental impact statements (EISs) and with continued deferral of data

[5] Comment letter of The Wilderness Society et. al on the Draft PEIS submitted on our May 1, 2011.

collection and analysis of other key elements of the program. Accordingly, we recommend the following **specific changes and provisions regarding NEPA analysis**:

- The Final PEIS should not require Director's Office concurrence *only* when an authorized officer determines that an EIS should be prepared to analyze a project within a zone. *See*, Supplement, pp. 2-20 – 2-21. Both the BLM and the Council on Environmental Quality have issued guidance regarding when an EIS or environmental assessment (EA) is appropriate. The Final PEIS should provide that the BLM will provide more specific considerations for determining when an EA or EIS is appropriate (to supplement existing guidance) and that employees may, as always, seeks advice from the Director's Office in making decisions about using an EIS or EA for project-specific solar applications within a zone. We are not taking the position that an EA will never be appropriate, but the current process sets out an apparent disincentive for BLM staff to use EISs even though EISs will often be the appropriate NEPA document.
- The Final PEIS should provide guidance on issues to be developed in NEPA analysis for specific solar applications within a zone, whether in an EA or EIS, including:
    - Identifying specific elements of analysis – simply stating (as the Supplement does) that "further evaluation will be required for future projects based on actual location, technology, POD, and so forth" (Supplement, p. 2-20) is not sufficient guidance. The Final PEIS should require that analysis of individual applications will address, at a minimum, features and resources of the actual location, technology, a reasonable range of alternatives, plan of development, cumulative impacts for affected landscape, and mitigation measures, and provide opportunities for public comment through scoping, preliminary alternatives, and draft NEPA document;
    - Specifying that robust public involvement is required, including requiring a comment period, even if using an EA, and emphasizing the benefits of early and ongoing public involvement, such as through providing preliminary alternatives for public comment;
    - Requiring cumulative impact analysis to address ongoing projects and stressors in the area, which cannot be accomplished through tiering;
- Preparation of regional mitigation plans is an important addition that could provide helpful information for tiering analysis of project-specific solar applications within those regions, including the much-needed cumulative impact analysis. The Final PEIS should include a clearer definition of the scope of these plans and a commitment and timetable for their completion[6];
- Because the adaptive management and monitoring plans will not be prepared until the Final PEIS, additional NEPA analysis in that document will be required to evaluate their effect on expected impacts;
- Changes to design features and additional analysis of SEZs, including natural and cultural resources, visual impacts, water use and transmission, are also deferred to the Final PEIS. Consequently, the agency will need to provide an opportunity for

[6] This is discussed in further detail in comments submitted by Defenders of Wildlife.

meaningful public comment on this analysis and respond to such comments in order to comply with NEPA[7].

The variance process should be clarified.

The variance process outlined in the Supplement is a new addition to the solar program and was not recommended by the conservation community in our comments on the Draft PEIS.[8] Nonetheless, we support the inclusion of a variance process because there are likely to be situations where development of projects outside of SEZs will be appropriate and will advance the goal of increasing sustainable generation of and access to appropriate solar energy resource areas (for example, when there is no room in existing zones in the near term, where a project with disturbed private lands can be expanded on similarly disturbed adjacent public lands, or where a project in a low conflict area is also in close proximity to existing transmission). *See* Supplement, p. 2-33.

However, it is crucial that this exception – i.e., authorizing new utility scale projects outside SEZs – does not become the rule – i.e., guiding development of these projects to SEZs in order to minimize environmental impacts. The variance process proposed in the Supplement was designed to "ensure that only those applications that can demonstrate that environmental impacts are minimized will be processed by the BLM." Supplement, p. 2-65. A few additional improvements, set out below, will provide even clearer guidance for developers evaluating potential sites outside SEZs and will reinforce Deputy Secretary Hayes' and BLM's commitments to locating utility-scale solar energy development in zones.

The Final PEIS should incorporate the following recommended improvements:

- State clearly that the burden is on the applicant to show that the proposed project-specific variance application is clearly appropriate; having committed to a zone-based program the BLM should not focus its limited resources on trying to "fix" proposals that are inappropriate;
- Provide that no applications will be accepted in areas identified as "high conflict" areas in IM 2011-061;
- Clarify that variance applications will be further screened to permit BLM to focus on proposed variance applications which appear to have the highest likelihood of success[9] (rather than using a "first in line" approach) and to give the lowest priority to applications that would affect sensitive or controversial resources (i.e., sage-grouse and desert tortoise habitats);
- For desert tortoise, employ special variance application requirements (rejecting Option 1 set out in the Supplement). *See* Supplement, pp. 2-35 – 2-36. Strengthen

[7] Since BLM regulations require a 30-day protest period and a concurrent 60-day governor consistency review of land use plan amendments (40 C.F.R. §§ 1610.5-2; 1610.5-3), the agency can provide an additional comment period during these same timeframes.

[8] Several of the groups submitting these comments did endorse the variance idea in comments that they submitted as members of the California Desert Renewable Energy Working Group (CDREWG).

[9] Ongoing processes such as Arizona's Restoration Design Energy Project and California's Desert Renewable Energy Conservation Plan could identify projects likely to succeed.

these requirements beyond those set out as Option 2 in the Supplement in order to address habitat quality in addition to numbers of tortoises. For applications in variance areas that are within the range of desert tortoise but outside of proposed connectivity areas (as modified by our recommendations above), the applicant must provide documentation of the following:

  - Project area has less than or equal to 2 tortoises (>160 mm Midline Carapace Length) per square mile; and
  - Where Habitat Potential Index Value is 0.7 or greater, verification that the habitat condition is "highly converted." This verification should be provided through application of science-based models of land conditions through field inspection[10];

- Adopt project-specific requirements for use in evaluating sites that include habitat for desert tortoise and/or greater sage-grouse. Species issues, and tortoise issues in particular, have proven to be the most problematic issues involved in the kind of ad hoc solar development process that is now underway. Without the kind of specific detail that is incorporated in Option 2 (Supplement, pp. 2-35 – 2-38), neither the BLM nor developers nor investors will have the kind of guidance that experience has shown that they need – i.e., specific standards that will help identify potential sites outside of SEZs that are appropriate; and
- Prior to accepting applications, the BLM should be required to consult with local municipalities affected to ensure applications are not in direct conflict with local land use plans such as comprehensive land use plans, open space plans, pending or adopted conservation plans or other officially adopted plans and policies.

Adherence to existing wildlife management policies should be affirmed:

The Solar PEIS should explicitly affirm that BLM land management policies, except where specifically modified in accordance with the Solar PEIS, will continue to guide land management and planning decisions. In particular, we point to current policies guiding the management of wildlife policies on public lands reflected in:

- Manual 6840 on Special Status Species Management for "sensitive" species – i.e., those at-risk, but not yet listed – which directs the BLM to "improve the condition of the species' habitat" or "minimize or eliminate threats affecting the status of the species";
- Manual 6500 on Wildlife and Fisheries Management which focuses on policy to "manage habitat with emphasis on ecosystems to ensure self-sustaining populations and a natural abundance and diversity of wildlife, fish, and plant resources on public lands" and further calls for the agency to "increase the amount and quality of habitat available"; and
- Handbook 4180 on BLM Rangeland Health Standards which states that "[h]abitats are, or are making significant progress towards being restored or maintained for Federal threatened and endangered species, Federal Proposed, Category 1 and 2 Federal candidate and other special status species."

[10] More detailed discussion of the scientific basis for these recommendations is provided in state-specific comments for California and Nevada.

In all these cases, the BLM's existing wildlife policy requires more than maintenance of the status quo. As such, these same policies apply to decisions affecting the siting, permitting, and development of solar projects on public lands; and **the Solar PEIS should reiterate the importance of complying with agency wildlife management policies**.

Thank you for your consideration of these comments. We look forward to seeing them addressed in the Final PEIS.

Sincerely yours,

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Thank you for your comment, Donald Krouse.

The comment tracking number that has been assigned to your comment is SEDDsupp20112.

Comment Date: January 27, 2012 11:38:14AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20112

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Attachment:

Comment Submitted:

It would seem reasonable to ask for an extension of time to review this 582 document so, therefore, I do so request at least a 90 day extension.

Thank you.

Thank you for your comment, Alan Bea'ls.

The comment tracking number that has been assigned to your comment is SEDDsupp20113.

Comment Date: January 27, 2012 12:36:58PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20113

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Attachment:

Comment Submitted:

Please stay with the "preferred solar zone" alternative with regard to solar energy production. We need to save as many pristine environments as possible.

Thank you for your comment, Bill Harper.

The comment tracking number that has been assigned to your comment is SEDDsupp20114.

Comment Date: January 27, 2012 12:47:48PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20114

First Name: Bill
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Last Name: Harper
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Address 3:
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State: [Withheld by requestor]
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Country: [Withheld by requestor]
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Attachment:

Comment Submitted:

The PEIS facilitates fast tracking for a very marginal industry in very precious Public Land. Industrial solar with its transmission costs are unsustainable. Since the PEIS process has begun rooftop solar prices have dropped by more than half.

To say that these arguments are outside the scope of the PEIS is disingenuine if you are REALLY considering the economic and cultural aspects.

To say that what the BLM and the DOE is doing has nothing to do with other goverments subsidies is absurd. Especially since the DOE is handing out those subsidies.

The PEIS are also faciilitaing Secret contracts with Public power providers. Where is the energy security in such an arraingement?

How can we make sustainable energy decisions with such arraingements?

The solar monitors at Rice Valley showed a week this September with only with 30 percent insolation due to monsoon storms from Baja while LA enjoyed sunshine. No help during peak demand.

The current and future drought and resulting fire and dust is only going the futher reduce insolation.

We have had once a century weather events the times this decade on the east coast. Hurricane and tornado eason is longer than ever. The wind will blow much harder more often than in the past in the southwest. Damaged panels are not being replaced at current facilties (see Google Earth; Kramer Junction, California).

I am sure that many of these facilites will last less than 10 years.

Banning Solar power on public lands would give us cheaper power with security.

Are we gong to make the same mistakes again or, are we going to"Man Up"?

Sincerly, Bill Harper

Thank you for your comment, Jan Bodendorf.

The comment tracking number that has been assigned to your comment is SEDDsupp20115.

Comment Date: January 27, 2012 13:07:36PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20115

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Attachment:

Comment Submitted:

I am against large-scale industrial development of Solar power in the San Luis valley or anywhere else, do to the many and obvious adverse effects on wildlife, plants, and people.
I wholeheartedly support the development of small-scale, locally controlled solar projects. If something is worth doing it is worth doing well, and large scale corporate controlled installations would do more harm than good on so very many levels. Emphatically not the right way to proceed! Let's take a cue from Hippocrates- first, do no harm.

Thank you for your comment, Dawn Meidinger.

The comment tracking number that has been assigned to your comment is SEDDsupp20116.

Comment Date: January 27, 2012 13:15:43PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20116

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Attachment: BNSF comments re SDPEIS.pdf

Comment Submitted:

Comments being submitted on behalf of BNSF Railway Company are attached.

FENNEMORE CRAIG, P.C.

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January 27, 2012

Via Electronic Posting (http://solareis.anl.gov/involve/comments/index.cfm) and Priority Mail

Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue – EVS/240
Argonne, Illinois 60439

Re: Bureau of Land Management ("BLM") - Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States ("SDPEIS"), 76 Fed. Reg. 66958 (Oct. 28, 2011); Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States ("DPEIS"), 75 Fed. Reg. 78980 (Dec. 17, 2010)

Dear Sir/Madam:

On behalf of BNSF Railway Company ("BNSF"), please consider the comments submitted herein regarding the SDPEIS, and by implication, the DPEIS. BNSF is submitting these comments because of the increased emphasis in the SDPEIS on the variance process rather than pre-designated solar energy zones ("SEZ"). The more flexible variance approach increases the likelihood that solar generation facilities will be located near BNSF tracks. These comments are intended to highlight the areas where advance screening and planning would be beneficial in the site selection and variance approval process.

I. BACKGROUND.

BNSF provides long-haul rail freight service throughout the United States, including in the six southwestern states of Arizona, California, Colorado, Nevada, New Mexico and Utah, on more than 23,000 miles of track. Portions of this system of track are operated as transcontinental main lines, which are critical freight arteries between the eastern United States and west coast ports. BNSF and its predecessors have been operating these lines since the 1880s. Traffic on

some of these lines has exceeded 100 trains per day during peak periods, moving at speeds up to 70 miles per hour for freight trains, and 90 miles per hour for Amtrak trains.

II. BNSF AUTHORITY.

The authorities under which BNSF operates its system of track and to which these comments relate include the following:

A. BNSF owns many of its rights of way through federal land by virtue of federal grants to its predecessors under, *inter alia*, the Act of July 27, 1866, 14 Stat. 292, the Act of March 3, 1871, 16 Stat. 573, and the Act of March 3, 1875, 18 Stat. 482.

B. The Federal Land Policy and Management Act of 1976 ("FLPMA") does not authorize Bureau of Land Management ("BLM") to terminate, restrict or impede the rights of a holder of a pre-FLPMA right of way. 43 U.S.C. § 1769; *City and County of Denver v. Bergland*, 695 F.2d 465 (10th Cir. 1982).

C. Under FLPMA, a right of way issued by BLM must contain terms and conditions that "protect Federal ... economic interests ... and protect the other lawful users of the lands adjacent to and traversed by such right of way." 43 U.S.C. § 1765.

D. The Interstate Commerce Commission Termination Act of 1995 preempts any state law or legal action that interferes with rail operations or facilities, and lodges exclusive jurisdiction to regulate railroad operations and facilities with the Surface Transportation Board. 49 U.S.C. §§ 10501, *et seq.*

E. The Federal Railroad Administration ("FRA") has jurisdiction over railroad signaling and other rail safety regulations in accordance with the Federal Rail Safety Act ("FRSA"), the Railway Safety Improvement Act ("RSIA"), and other provisions of Title 49 U.S.C. and Title 49 C.F.R.

III. INDUSTRY COORDINATION.

The SDPEIS sets forth a process whereby BLM may consider a variance for the siting of a solar development project outside of a SEZ (*see* SDPEIS, Section 2.2.2.3, pages 2-33 through 2-40). The variance process contemplates BLM coordinating and consulting with various federal, state, local and tribal entities, as well as communicating with any potentially affected grazing permittee/lessee, and with the owner of any federal mining claims and/or mineral leases located within the boundaries of the proposed solar development project area. Unfortunately, the

SDPEIS variance process fails to adequately provide for the consideration of potential effects to railroad rights of way and railroad operations.

BNSF strongly recommends that at a minimum, the SDPEIS variance process specifically state that BLM must communicate with and give due consideration to the concerns of any potentially affected railroad right of way holder that maintains rights, facilities or operations near the boundaries of a proposed solar development project subject to the variance process. In addition to the issues noted above, issues unique to a particular solar development site under consideration for a variance should be identified early in the variance process. BLM will not be able to adequately identify such issues without input from railroad right of way holders, such as BNSF.

To the extent BLM personnel share the erroneous view reflected in the DPEIS that solar installations will not have a significant impact on railroads, BLM personnel may not include railroads among the potentially affected parties receiving notice under 43 CFR 2807.14. Because BLM is required to deny any variance that has the effect of terminating, restricting or impeding the operations of railroad right of way holders as a matter of law, identifying conflicts at an early stage of planning will benefit all participants in the process.

IV. SPECIFIC IMPACTS REQUIRING CONSIDERATION.

Interestingly, the DPEIS states in Section 5.19.1.1 that:

> **"[u]tility-scale solar energy projects are expected to have an insignificant impact on railroad operations."**

This cursory conclusion is unsupported and should be substantially revised in the final PEIS. In so doing, the BLM can look to the recently proposed Calico Solar Project near Barstow, California (CACA 49537) ("Calico Project") and the many issues that arose in the context of siting that project near the BNSF right of way.

As a result of the Calico Project, BNSF has developed a specific list of concerns relating to effects in the areas immediately surrounding its rights of way and track. These effects generally fall into six broad categories: (a) glint and glare; (b) stormwater runoff, hydrologic behavior and sedimentation; (c) right of way crossings; (d) transmission line safety and nuisance (e) hazardous materials management; and (f) emergency access. BNSF wants to ensure that these effects are adequately addressed and analyzed for any project considered for a variance outside of a SEZ. SDPEIS Section 2.2.1.3 indicates that the Design Features listed in Appendix A, Section A.2.2 of the DPEIS will be incorporated into the application process, so BNSF's comments are keyed to the applicable Design Features.

A. Glint and Glare.

Table A.2-1 in Appendix A of the DPEIS requires a Glint and Glare Assessment, Mitigation and Monitoring Plan, but the subsequent specifications do not adequately address potential railroad issues. For example, the last bullet point in Section A.2.2.1 indicates that "glare from reflective surfaces shall be evaluated through coordination with local airport operators," but does not address railroads. Similarly, Section A.2.2.13.1 under the subheading "Glint and Glare" recognizes the potential impact on "roadway users" but not railroads. The third bullet point of Section A.2.2.22.2 also fails to identify the public safety impact of glint and glare on nearby railroads. These examples suggest that BLM has dramatically underestimated the potential impact of glint and glare on railroads.

To the contrary, BNSF is very concerned that glint and glare from solar arrays installed in the vicinity of BNSF rights of way may interfere with critical safety and operational functions, including signaling and the ability of train crews to see potential safety hazards. Intense glint and glare from solar arrays installed near BNSF rights of way could cause the following serious impacts on transportation and public safety: (i) flash blindness or other visual effects preventing the crews from perceiving obstructions on the tracks or other safety hazards; (ii) blindness, veiling reflections or distractions preventing crews from maintaining visual contact with critical signals; and (iii) technology effects such as phantom signals caused by low-angle reflections on the signal equipment. Signaling and train safety are regulated by FRA, not BLM.

Glint and glare impacts have a very high potential to cause catastrophic crossing accidents or derailments. Even in the absence of catastrophic accidents, glint and glare impacts could cause major transportation delays because train crews must stop the trains on an emergency basis if they are not able to see the signals. When a train has been stopped through an emergency application of the brakes, BNSF General Code of Operating Rule 6.23 requires the engineer to inspect all cars, units, equipment and track. Trains on the main line exceed a mile in length and run approximately every 15 minutes, so it is not difficult to see that every emergency stop has the potential to cause significant delays with ramifications reaching from the ports of Los Angeles and Long Beach to Chicago and beyond.

BNSF recommends that, at a minimum, the SDPEIS include railroads in each instance where glint and glare impacts are to be assessed, and require any future solar development projects to analyze the effects of glint and glare on any affected railroad operators. Adequate analysis would require a site-specific and technology-specific study analyzing the effect of glint and glare on railroad signaling technology as well as on the visual perception of railroad personnel. Any such study must address the unique angles and field of vision experienced by railroad personnel traveling along the tracks near the project area. This type of modeling is feasible using available simulation technology and should be required for any project located anywhere near a rail line.

To the extent that glint and glare are identified as a safety concern, BLM should require the proponent to include adequate setbacks and/or shielding in the project plans prior to the approval of any solar development project. The above requirements should be incorporated at the programmatic level, and not simply addressed on a case-by-case basis, so as to ensure uniformity in application across all future solar developments projects.

B. Stormwater Runoff, Hydrologic Behavior and Sedimentation.

Table A.2-1 in Appendix A of the DPEIS requires both a Stormwater Management Plan and a Drainage, Erosion and Sediment Control Plan. The requirements associated with these plans are extensive, but based on BNSF's experience with the Calico Project, there is a danger that solar developers will seek to minimize the impacts of their projects on surrounding rail lines. Most of BNSF's main line tracks in this region have been in place for over 100 years, and BNSF has extensive experience dealing with geomorphic and hydrologic issues such as flooding, sedimentation, infiltration and subsidence. Much of the southwestern desert region is prone to flash flooding, with potentially catastrophic effects on BNSF's track structure. Large scale solar generation projects can be expected to have significant impacts on local hydrologic systems.

For example, the proposed Calico Project is located on natural "desert pavement" within an active alluvial fan sloping down toward BNSF's right of way. This situation is likely to recur as gently southward sloping alluvial fans may be considered attractive locations for solar development in a basin and range desert environment. Desert pavement is a crust consisting of coarser materials from which finer sediment has been removed by wind or water erosion. Alluvial fans are very large broad based flat lying geologic land surface structures resulting from very long periods of water and wind erosion. Active alluvial fans are by nature unstable, and disturbance of large areas of alluvial fans and desert pavement associated with solar project development will affect the stormwater runoff, hydrologic behavior, and sedimentation on the project area as well as on all down gradient areas.

Disturbance of alluvial fans and desert pavement will occur during construction and operation of a solar development project through several mechanisms. For instance, during the construction phase on the photovoltaic arrays currently proposed at the Calico Project, vertical steel posts will be driven five to six feet into the ground every 12 to 15 feet. Such construction requires heavy equipment to traverse virtually every square foot of a solar development project site, and will generate intense vibration, pulverizing, displacing and completely destroying the desert pavement crust throughout the entire project area. After construction, ongoing operation and maintenance activities will require the continual use of a system of unimproved access roads that are spaced on every other solar array, which will potentially amount to many hundreds, if not thousands of miles of roads. Use of the roads will create ruts and channels, which will in turn become erosion pathways for pulverized desert pavement during storm events, being fed by the parallel running drip lines of the solar arrays.

BNSF is very concerned that any future solar development project up-gradient from its rights of way or other railroad facilities may be impacted from such disturbance, potentially leading to subsidence, flooding, infiltration, fouling of track ballast and/or sedimentation of critical culverts and bridge structures under the tracks. BNSF strongly recommends that at a minimum, the SDPEIS address the unique issues associated with the disturbance of hydrologic systems, particularly desert pavement and alluvial fans, during the construction, operation and maintenance activities of a solar development project. BLM should be especially skeptical of claims that solar construction will have a minimal impact on these types of hydrologic systems. BLM should require any future solar development project to adequately analyze the effects of such activities as they relate to stormwater runoff, hydrologic behavior and sedimentation on down gradient railroad facilities. To the extent that effects are identified, BLM should require the construction of adequate runoff structures and/or implementation of controls prior to approval of any solar development project. The above requirements should be incorporated at the programmatic level, and not simply addressed on a case-by-case basis, so as to ensure uniformity in application across all future solar development projects.

C. Right of Way Crossings.

Table A.2-1 in Appendix A of the DPEIS requires an Access Road Siting and Management Plan. Access roads are addressed within the subsequent specifications for construction, operation, and in relation to adjacent realty, but specific issues associated with railroad crossings are not addressed. To the extent that a solar development project is sited adjacent to or on both sides of a BNSF right of way, it is likely that the solar project will require a right of way crossing for access. In addition, crossings for electric lines, water pipelines or for other purposes may also be necessary. The project proponent may desire to locate such crossings in areas that are not presently authorized by BNSF, FRA or the state regulatory agencies. BNSF is very concerned that in such circumstances, a solar development project proponent, and BLM, will simply assume that rights for additional crossings may be acquired without any input from the underlying right of way holder.

BNSF strongly recommends that the DPEIS and SDPEIS address potential right of way crossing issues, and require solar development project proponents to identify and acquire necessary rights for crossings prior to BLM giving consideration to projects that are adjacent to or straddle railroad rights of way. The above requirements should be incorporated at the programmatic level, and not simply addressed on a case-by-case basis, so as to ensure uniformity in application across all future solar development projects.

D. Transmission Line Safety and Nuisance.

Transmission lines are addressed throughout the DPEIS and the SDPEIS, but transmission planning does not appear to be addressed in any of the specific Design Features in Table A.2-1. Transmission lines close to railroad tracks can result in electrical induction on the rail. Electrical induction is a commonly overlooked effect of transmission lines, and it may result in significant health risks, including death by electrical shock. Electrical induction also has the potential for significant adverse impact on rail operations, including equipment and signal malfunction. Without addressing site specific issues, electrical induction problems can generally be avoided by maintaining at least a 300 foot setback from the outside edge of BNSF's right of way for parallel transmission lines, and requiring transmission lines to cross the tracks at a 90-degree angle. BNSF strongly recommends that BLM clarify where transmission lines fit into the early Design Feature deliverables, and include railroad setback requirements in the bullet point lists of issue to be addressed.

E. Hazardous Materials Management.

Table A.2-1 in Appendix A of the DPEIS requires a Hazardous Materials and Waste Management Plan. Utility scale solar electric generation facilities may involve the production, use and transportation of hazardous materials such as hydrogen. These concerns are site-specific and technology-specific, but any such material should generally be located away from the railroad right of way, and the need for either vehicular or pipeline crossings should be minimized. BNSF strongly recommends that BLM incorporate these requirements into the Design Features for Hazardous Materials and Waste in Section A.2.2.21 of the DPEIS.

F. Emergency Access.

Any project located along a significant stretch of railroad track should be required to ensure continued access to the adjacent rail by the rail operator in the event of a derailment or other emergency. Security concerns and biological mitigation plans may require installation of fencing or other facilities that could interfere with emergency access to BNSF's right of way. Project proponents should be required to plan for emergency access, including the possibility that BNSF may need to temporarily remove features such as fences. BNSF strongly recommends that BLM incorporate these requirements into the Design Features for Transportation Impacts, Design Features for Hazardous Materials and Waste, and Design Features to Ensure Health and Safety, in Sections A.2.2.20, A.2.2.21 and A.2.2.22, respectively, of the DPEIS.

V. RESOURCE MANAGEMENT PLAN AMENDMENT DEFICIENCIES.

Federal regulations require BLM to strictly follow and adhere to a planning process when making amendments to resource management plans. *See* 43 C.F.R. § 1610.5-5 (b) (process for amendments mirrors process for developing a new plan); *see also* 43 C.F.R. Subpart 1610. The objective of the planning process as set forth in the regulations is to ensure that BLM follows a sequence of steps resulting in meaningful participation in and comment on the preparation of an amendment. This process involves issue identification, the development of planning criteria and public comment thereon, as well as the development of alternatives and an assessment of effects of those alternatives.

As noted above, BNSF contends that important issues relating to railroad rights of way have not been identified or adequately addressed during the process of amending the many resource management plans identified in the SPDEIS and DPEIS. Further, BNSF notes that neither the SDPEIS nor the DPEIS set forth the proposed amendments to these resource management plans in an easily accessible or understandable format, and no alternatives (or related assessment of impacts) appear to have been provided by the agency. Because of these deficiencies, BNSF remains concerned that BLM has not met its burden under the applicable regulations, and that the entire resource management plan amendment process utilized by BLM in the SPDEIS and DPEIS may be legally deficient.

BNSF is hopeful that the identified deficiencies in the SDPEIS, and DPEIS by implication, will be adequately addressed in the Final PEIS. In addition, BNSF encourages BLM to coordinate with BNSF very early in the process regarding any future variance determination that may affect BNSF rights of ways and/or railroad operations. Thank you for your consideration of these comments.

Sincerely,

Dawn G. Meidinger

6630231

Thank you for your comment, Johnney Coon.

The comment tracking number that has been assigned to your comment is SEDDsupp20117.

Comment Date: January 27, 2012 13:46:25PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20117

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Attachment:

Comment Submitted:

I'm writing to comment on the Solar SPEIS. I've been a resident of Desert Center for over 35 years. I'm a landowner and former grape farmer. This land I love, if the government continues on this ill-advised course, will be scraped clean of the native old growth vegetation and then solar panels will take its place. The wildlife that survives the graders will then be run off their land, their homes and food sources destroyed. There are many of us who call the desert home, recreate here, respect and enjoy the subtle beauty, peace and quiet nature of these wild desert lands.
It makes me very angry that this administration, whom I pay my taxes to and who supposedly works for the people will not even consider as an alternative, distributed generation. This administration unlike any other is leading the way towards the wholesale destruction of the southwestern deserts. I do not appreciate my tax dollars being used to destroy our pristine public desert lands. And it is pristine wilderness. These are public lands that have never been cleared. Once cleared, they are forever changed and degraded.
Much is at stake here. From our decreasing water table that may not be able to continue to sustain us, to the eutrophication of the desert that would have a profoundly negative inpact on the desert flora and fauna. The release of arsenic that occurs naturally in desert soils, but when this soil is disturbed this carcinogen will be released for both humans and animals to breathe in. Our clean non-polluted bright blue skies currently free from airborne particulates, at least prior to the current construction now in progress, to our very dark night skies perfect for viewing the stars, planets and the milky way. The desert wildlife including the threatened desert tortoise, our health and well-being are all in peril.
This is bad policy, bad for the people and particularly bad for the environment and the animals that depend on it. We owe future generations an intact desert ecosystem, not one that has been abused and degraded for corporate profit and short-sighted greed.
Sincerely,

Johnney Coon

Thank you for your comment, Donald Forman.

The comment tracking number that has been assigned to your comment is SEDDsupp20118.

Comment Date: January 27, 2012 13:47:01PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20118

First Name: Donald
Middle Initial:
Last Name: Forman
Organization:
Address: 2438 Byron St.
Address 2:
Address 3:
City: Berkeley
State: CA
Zip: 94702
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

I support the preferred solar-zone alternative for solar-development applications.

“Variances” for solar development outside of solar-energy zones should be carefully limited to areas with low resource conflicts, and only when solar-energy zones contain insufficient land. Variance applications should be processed in accordance with IM No. 2011-061.

Additional exclusion areas should be added to include additional environmentally sensitive areas and those areas important to the survival of wildlife species such as wildlife-habitat management areas, golden-eagle foraging and nesting habitat, the entire Ivanpah Valley in both Nevada and California, Citizens Wilderness Proposals, lands acquired by the BLM for conservation purposes, and the entire Pisgah Valley.

Thank you for your comment, Freddie Romero.

The comment tracking number that has been assigned to your comment is SEDDsupp20119.

Comment Date: January 27, 2012 13:52:57PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20119

First Name: Freddie
Middle Initial: R
Last Name: Romero
Organization:
Address: 100 Via Jauna
Address 2:
Address 3:
City: Santa Ynez
State: CA
Zip: 93460
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

We can't continue to destroy lands and think that they will be of no effect to the environment.

Although the search for alternative energy and the implementation are noble and a worthy effort, we can't afford to do this at the cost valuble eco-systems that are the responsibility of those who hve been given the stewardship over.

When it comes to the installation of solar power, we need to give serious consideration for all alternatives to it's placement. With the millions and millions of square feet of rooftops that we have in this country, they do represent a viable alternative.

Lets not destory our deserts becuase they are there, but let's be a responsible nation to the stewardship of our natural resources.

Thank you for your comment, Andrea Guajardo.

The comment tracking number that has been assigned to your comment is SEDDsupp20120.

Comment Date: January 27, 2012 13:58:40PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20120

First Name: Andrea
Middle Initial: T
Last Name: Guajardo
Organization: Conejos County Clean Water, Inc.
Address: P.O. Box 153
Address 2:
Address 3:
City: Antonito
State: CO
Zip: 81120
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Comment Supplement DPEIS SEZ .pdf

Comment Submitted:

Delivered online via project website

Attn: Linda Resseguie
Argonne National Laboratory
9700 S. Cass Avenue
EVS/240
Argonne, IL 60439

RE: Public Comment for the Supplement to the Draft Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States

January 27, 2012

Dear Ms. Linda Resseguie:

Conejos County Clean Water, Inc. (CCCW) thanks the Bureau of Land Management (BLM) and Department of Energy (DOE) for the opportunity to comment on the Supplement to the Draft PEIS (Supplement) for Solar Energy Development in Six Southwestern States.

Please accept this as a formal statement of concerns and recommendations from CCCW related to the Supplement specifically pertaining to the two sites proposed for Solar Energy Zone (SEZ) designation located in Conejos County, Colorado: Los Mogotes East, and Antonito Southeast. CCCW is a 501(c)(3) non-profit citizens' group, based in Antonito, Colorado, that is incorporated under the laws of the State of Colorado.

CCCW submitted a comment in April of 2011 with regard to the Draft PEIS for Solar Energy Development in six southwestern states. Please accept this comment as an update to that comment.

Since then, CCCW has attended various discussions throughout the state of Colorado regarding generation, transmission, and energy related policy. As a result, CCCW encourages conversations on energy use, especially on renewable energy and how it can be structured to offer a clean, affordable, sustainable, and environmentally friendly alternative to carbon and nuclear-based fuels.

CCCW recognizes the unique and valuable aspects Conejos County holds on our private and public lands in terms of resource value for the country's potential solar production. There is a history in Conejos County of supporting solar energy on a distributed scale to power center-pivot sprinklers, schools, and homes. CCCW encourages the development of renewable energy strategies that promote long-term public health, environmental health, water conservation, and the cultural preservation of Conejos County. CCCW respectfully requests that the DOE and BLM take a comprehensive, holistic, and sustainable view, and not compromise Conejos County's unique history, culture and environment in the process of implementing utility-scale solar development plans.

CCCW hosted a public forum with technical facilitation by Grand Environmental Services and Rebecca English & Associates on January 14, 2012 in Conejos, Colorado. The purpose of the forum was to provide an overview of the Supplement to community members unable to attend meetings in Alamosa County, and to encourage the community to submit comments to the BLM and DOE by January 27, 2012. CCCW gathered community concerns and recommendations, which CCCW tried to encompass in the following comment. As CCCW's executive director, I have observed there is a lot of confusion in our community as to the exact nature of a programmatic effort; there are segments of both strong support and strong opposition to the program. As a result, CCCW synthesized the reasons people support and oppose the program into concerns and recommendations. Thank you for providing the idea behind some powerful community discussions. Moving forward, we hope the BLM and DOE can be more present in the community to ensure that confusion is at a minimum. Thank you to BLM's Andrew Archuleta for participating in a portion of the community forum, his presence was very helpful. Please consider the comments on behalf of CCCW with appropriate gravitas.

Table of Contents

Background of CCCW and Relationship to the Affected Environment

Conejos County Clean Water, Inc.'s (CCCW) relationship to the affected environment remains largely unchanged since its original comments on the SEZs made in April 2011. In June of 2010, concerned citizens incorporated into a Colorado non-profit organization called Conejos County Clean Water, Inc. (CCCW). CCCW incorporated in order to promote awareness around health and environmental issues that affect residents in Conejos County, as a vehicle for protecting public health, and to responsibly manage natural resources. CCCW is comprised of ranchers, teachers, small business owners, and concerned citizens. CCCW has eleven Board members, who also serve as the organization's Steering Committee, and 402 general members.

The San Luis Valley (SLV; the Valley) in south central Colorado is one of the largest sub-alpine Valleys in the world, encompassing over 8,100 square miles. Hemmed in on the west by the San Juan Mountains, and on the east by the Sangre de Cristo Mountains, the SLV ranges in elevation from 7,000 to over 14,000 feet, and contains the headwaters of the Rio Grande River. The Rio Grande River rises in the San Juan Mountains to the west of the SLV, flows south into New Mexico and Texas and empties into the Gulf of Mexico.

The SLV has many unique biological features, including areas identified as Natural Heritage areas, and is home to six endemic insect species.

The SLV is 122 miles long and 74 miles wide. This largely agrarian and ranching community has a relatively stable population. Many of the residents are eighth-generation. The oldest Catholic parish in Colorado, Nuestra Señora de Guadalupe (Our Lady of Guadalupe) lies at the southern end of Conejos County. Conejos County is part of the Sangre de Cristo National Heritage Area (NHA). About sixty percent (60%) of Conejos County's population is minority, and pride in the Hispanic heritage is evident in everything from the names of the rivers, mountains, and towns, to the local Spanish/English radio station. The median household income is less than half the national average at $24,744, and 38 percent of the children live in poverty (US Census 2000).

The SLV is known for its potatoes and alfalfa, and also grows barley, lettuce, wheat, peas, and spring grains. It has been a farming and ranching community for over 150 years, and many of the residents work in agriculture, following in the footsteps of their parents and grandparents. Many of the farmers and ranchers still practice traditional methods. The SLV is the highest irrigated mountain plateau in the world, with about 7000 high capacity wells, over half of which are irrigation wells.

The SLV contains over 5 million acres, of which 3.1 million acres – about 59 percent – are publicly owned (Forest Service, BLM, Fish & Wildlife Service, National Park Service, or state). Conejos County contains over 825,000 acres, of which 561,000 acres – about 68 percent – are publicly owned (Forest Service, BLM, Bureau of Reclamation, or state). This land control configuration creates an important relationship between the public and private sectors with regard to air and water quality issues, and water and groundwater quantity issues, in the SLV and Conejos County.

There are 18 incorporated towns in the SLV, many of which are located along the Rio Grande or its many tributaries. Six counties lie within this large geographical boundary: Alamosa, Rio Grande, Saguache, Mineral, Costilla, and Conejos. There are 21 villages and five incorporated towns in Conejos County. Conejos County is among the poorest counties in the country, and unemployment levels run above the state and national averages (Conejos County 10.5%; as of 2008 – not including the chronically unemployed).

SEZ sites Los Mogotes East and Antonito Southeast are located in SLV's populated Conejos County near the incorporated towns of Romeo and Antonito respectively.

Supplement to the Draft Solar PEIS Document

(Supplement page 1-5)

CCCW recognizes this is a National Environmental Policy Act (NEPA) programmatic effort and understands the Supplement to the Draft Solar PEIS aims primarily to decide:

1) Which BLM lands are not suitable for solar development
2) Which BLM lands are suitable for:
    - Solar Energy Zones (SEZ) = smaller area acres all in the SLV
    - Zones Plus = larger area acres in SLV and elsewhere in Colorado. This includes a variance process to identify and designate new SEZs in the Zones Plus areas.
    - Under "No Action" almost all BLM lands would remain open to solar development, absent direct conflicts
3) Under what conditions BLM and DOE should decide to proceed into the next round of NEPA.

Many citizens of Conejos County speak Spanish only, or Spanish as their first language, and it would be helpful to provide project information in the regional colloquial Spanish. Thank you for the detailed and thorough preparation of the

Supplement. The document was very large and expensive to print out. Of our 402 members, only 70 have access to email and Internet.

CCCW respectfully recommends:

1) that BLM create the following materials in both English and Spanish for optimal public review and understanding, and for reference at public meetings:

    a. One-page summary documents for each state,
    b. Comparative tables summarizing the proposal, and
    c. A document enumerating impacts for SLV only.

2) that printed project documents in both English and Spanish be placed in libraries and post offices in Conejos County, due to extremely limited Internet access.

Purpose and Need

(Supplement pages 1-6 through 1-16 and Supplement page 2-2 through 2-10)

CCCW understands that the Supplement promotes a utility-scale (greater than 20 MW) development model. Various executive orders drive this choice of development scale: Executive Order (E.O.) 13212 ("Actions to Expedite Energy-Related Projects," Federal Register, volume 66, page 28357, May 22, 2011), and Secretarial Order 3285A1 (Secretary of the Interior 2010), federal policy mandates, Energy Policy Act of 2005, and the Renewable Portfolio Standards (RPS) of the states in the study area.[1]

We observe that this effort to streamline a permitting process for the utility-scale solar industry is policy-driven in consideration of scientific data regarding the necessity to achieve a clean energy future for the United States. We hope that this programmatic effort will lead to a clean energy future, but at this time it is speculative as to how this effort to streamline a permitting process on public land will shape our energy future in Conejos County, the SLV, the state and the nation. There is information and belief that the state of Colorado is meeting its renewable portfolio standard (RPS) prior to the 2020 deadline, meaning that there is 30% renewable energy already hard-wired in Colorado's largest investor-owned utility service territory (Xcel's Public Service Company territory).

Please accept as resource material the following data-driven policy planning guide to a carbon and nuclear free energy infrastructure with economic growth, *Carbon-*

[1] *See* Supplement page 1-3, Line 32 "the BLM has identified a need to respond in a more efficient and effective manner to the high interest in siting utility-scale solar"

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Free and Nuclear-Free: A Roadmap for U.S. Energy Policy by Arjun Makhijani, Ph.D.[2] CCCW recognizes that the PEIS has been an enormous and time-consuming effort for the BLM and DOE, undertaken at the same time during which both entities are charged with driving the United State to a clean energy future. However, the primary goal of a clean energy future does not appear to be an objective or a purpose, nor is it a need described in the PEIS documentation shared with the public to date.

At the same time, promoting utility scale development in Conejos County communities may devalue local efforts, and promote boom-bust energy cycles that incidentally create:

- **Maximum environmental impacts** by enforcing accelerated project schedules, [3]
- **Least local benefits** since there is not a legal revenue sharing mechanism due to the Federal Lands Management Policy Act of 1976, and [4]
- **A push for additional transmission** since there is only a 69kV line feeding Conejos County, which dead-ends in the incorporated municipality of Antonito.

Some local citizens speculate that this programmatic effort will remove a coal plant from the central grid, claiming that the additional central-scale solar developments will reduce dependency on fossil fuels. CCCW views these observations as a linear trade-off of a utility scale intermittent generation source for a continuous utility scale base load generation such as coal and nuclear, and notes these to be a false comparison. Listening to technical experts across the state of Colorado, CCCW understands that coal and nuclear provide continuous base load power on the central grid, and that natural gas buffers the intermittency created by the renewable energy load on the central grid.[5]

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[2] Makhijani, *A Roadmap for U.S. Energy Policy*

[3] *See* Supplement page 2-10 Line 39 – "that construction must be completed within the time frames in the approved POD, but no later than 24 months after start of construction unless the project has been approved for phased development as described below," and Supplement page 2-10 Line 44 "the BLM will not authorize more than three development phases for any solar energy ROW authorization"

[4] *See* "Supplement page 2-Line 8 – ROW Authorizations – applications for utility-scale solar energy facilities will be authorized ROWs under Title V of FLPMA and 43 CFR Part 2800," Line 19 – "the term "ROW" as defined by FLPMA includes and easement, lease, permit, or license to occupy, use, or traverse public lands," and page 2-3 Line 22 "FLPMA does not provide existing or current authorities for the collection of royalties,"

[5] U.S. DOE/EIA-0383 (2011), *Annual Energy Outlook 2011 with Projections to 2035*, online at: http://www.eia.gov/forecasts/aeo/pdf/0383(2011).pdf

CCCW respectfully recommends:

3) that the Final PEIS include the distributed generation (DG) model for solar development as a viable approach in the SLV, and that BLM and DOE recognize that locally based generation and use is a way to promote reliability and redundancy. We request that BLM and DOE evaluate regional business models that make DG difficult to integrate into the central grid.

4) incorporation of the recommendations made in *Carbon-Free and Nuclear-Free: A Roadmap for U.S. Energy Policy by Arjun Makhijani, Ph.D*. into the Final PEIS.

5) that prior to an application for solar development being accepted on public land in Conejos County, private land according to the SLV siting map[6] be investigated. Development on private land allows local control of project schedule and size, allows for revenue sharing, and may eliminate the need for additional transmission.

6) that transmission and associated impacts be identified. There is a 69kV line to the town of Antonito (3 miles north of the Antonito Southeast proposed SEZ), but no plans to upgrade lines.[7] The Colorado Public Utilities Commission has not approved a plan for transmission south of Antonito.

7) that the Final PEIS clearly quantify how this programmatic effort will remove coal plants from the central-grid and reduce dependency on fossil fuels.

Array of Alternatives

(BLM - Supplement pages 2-1 through 2-82, DOE – Supplement pages 3-1 through 3-9)

The action alternatives proposed in the Supplement to the Draft Solar PEIS do not have adequate transmission for either the Los Mogotes East proposed SEZ or the Antonito Southeast proposed SEZ. CCCW notices that both transmission and storage need to be upgraded.[8,9]

This BLM and DOE programmatic effort targets the following for Colorado BLM: 2,194 MWs on 19,746 acres, Non-BLM: 731 MWs on 6,579 acres. We understand that BLM and DOE want to incentivize solar development by simplifying the process for developers. However, we are deeply concerned that we see no incentives for the local

[6] Siting map online at: http://slvec.org/images/stories/docs/6.23.10.SLVWPCEC_solarsensitiveresources_17x11_6162010.pdf
[7] Public Service Company of Colorado 2014 Renewable Energy Standard Compliance Plan online at: http://www.xcelenergy.com/staticfiles/xe/Regulatory/Regulatory PDFs/CO_11A-XXXE_2012_RES_Vol. 2.pdf.
[8] *See* page 1-8 of Supplement
[9] *See* Supplement page 2-26 "Encourage Solar Development on Appropriate Nonfederal Lands Line 3 - The DOI will encourage development of renewable energy on appropriate nonfederal lands. For projects proposed jointly on SEZ lands and adjacent private, state, Tribal, or U.S. DOD withdrawn lands, DOI's permitting incentives as described for SEZs would apply to the entire project".

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community. Examples of such communities that benefit from such incentives can be witnessed in communities such as Elko, Nevada, which thrives around mining areas, as well as communities near Carlsbad, New Mexico which thrive around Oil &Gas.

We recognize we are proposing a breaking of revolutionary ground with the concept of recommending a bridge between the two paradigms – BLM and DOE SEZ-paradigm, and the local community DG paradigm -- regarding desired SEZ developer DG subsidy, infrastructure impacts compensation, or gifts to communities, but please bear in mind the SLV has all four proposed SEZs for the state of Colorado in one watershed, and the Antonito Southeast proposed SEZ, in Conejos County, carries the majority of the acreage. In proposing to develop a new utility scale renewable energy industry, without a legal revenue sharing mechanism would be an exacerbation of the aforementioned socioeconomic and employment issues; please consider our recommendations as a feasible and necessary alternative to the current incentive program.

CCCW respectfully recommends:

8) That BLM and DOE consider another alternative in their analysis: Cap the total power generation goal in the SLV from renewable energy sources to equal the amount needed locally plus the amount that can reasonably be transmitted out of the SLV over Poncha Pass. This new proposed alternative does not force the development of new transmission corridors. Consider the following:

   - SLV has a peak load of 150 MW locally, and Valley distributed generation providers can transmit 550 MW out of the SLV over Poncha Pass with reasonable transmission upgrades; the SLV cap should be 700 MW of generation. The San Luis Valley Solar/Transmission Working Group calculates a higher number for the total SLV solar power cap at 950 MW, including 150 MW local load and 800 MW exportable power across Poncha Pass with Transmission upgrades.[10,11]
   - Emphasize efficiency, conservation, and "smart grid" technologies.
   - Consider small hydro and other technologies to round out the energy portfolio.
   - Add energy storage at all substations.
   - Phase in energy development to promote long-term jobs and revenue.
   - Work with the Governor's Energy Office and DOE to better understand options.
   - Use zoning, annexation, and other incentives to motivate energy-related companies to locate offices, assembly, and warehouse facilities in incorporated municipalities, rather than in construction trailers on county or federal lands.

[10] Brubaker and Associates, Inc. Alternatives to the San Luis Valley-Calumet Portion of the San Luis Valley Calumet-Commanche Transmission Project, dated October 28, 2009, p.4

[11] San Luis Valley Solar/Transmission Line Alternatives and Redundancy Recommendations, also know as the "Solar Position Paper" compiled by San Luis Valley Ecosystem Council in cooperation with the Citizens for San Luis Valley Water Protection Coalition, dated June 7, 2010 updated Junuary 14, 2012

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- Use incentives to motivate energy-related companies to hire local staff and construction workers. Encourage companies to prioritize hiring workers in local families who live in the towns of Romeo and Antonito rather than importing workers who live in "man-camps."
- Schedule energy construction work to avoid planting and harvest seasons to expand opportunities for local workers.
- Perform any new or existing infrastructure upgrades in a way that eliminates the exposure of Conejos County residents to harmful electromagnetic frequencies.

Please see Attachment A for adjacent non-federal sites identified at a Colorado Renewable Energy Workshop held in Monte Vista, Colorado at which the town of Antonito was a case study. The town of Antonito is strategically positioned at the end of the grid to monitor concentrated load and distribution to the agriculture community.

Infrastructure

(Supplement page 1-3, page 1-6 through 1-7, page 2-30 and page C-79 line 16)

CCCW raises the concern that there is inadequate existing transmission infrastructure to accommodate the large-scale utility development if any of the three action alternatives is selected in the Final PEIS. All action alternatives result in designating Los Mogotes East as an SEZ and designating Antonito Southeast as an SEZ. We observe that the Supplement has identified existing transmission corridors near proposed SEZ sites. To reiterate: there is just a 69kV line that feeds both the incorporated towns of Romeo and dead-ends in Antonito, approximately three miles north of the proposed Antonito Southeast SEZ. We understand this 69kV line will not export of power from a 20 MW project, which is the minimum size of project application eligible in the Supplement.[12] SEZ development therefore requires significant upgrade of transmission to be viable, confirming the Colorado Governor's Energy Office (2009) identification of the greater SLV as transmission-limited by the Renewable Energy Development Infrastructure (REDI). We have no major electricity load centers near Romeo or Antonito or transmission corridors approved south of Antonito into New Mexico, and there are no plans to upgrade lines. Upgrade of the lines over Poncha Pass is proposed in the year 2016. The Public Utilities Commission has not considered a plan for approval of a new corridor for transmission south out of Antonito, nor has it considered a transmission loop inside the Valley. In addition, in November of 2011, Xcel dropped its plan for a new transmission corridor to carry solar-generated electrons north to the front range population centers over La Veta Pass.[13]

[12] *See* Supplement page 1-3, Line 13 – "Comment from solar industry – sufficient acreage to accommodate projected levels of development, the identified SEZs might not be located in the right places for meeting market demand."
[13] Public Service Company of Colorado 2014 Renewable Energy Standard Compliance Plan online at: http://www.xcelenergy.com/staticfiles/xe/Regulatory/Regulatory PDFs/CO_11A-XXXE_2012_RES_Vol. 2.pdf.

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While the above focuses on electrical generation and transmission, parallel arguments can be said for other infrastructure including transportation and municipal, health/safety, workforce, and education services.

CCCW understands that Congress enacted NEPA to "promote efforts which will prevent or eliminate damage to the environment." 42 U.S.C.§ 4331. CCCW also understands the cornerstone of NEPA is the environmental impact statement (EIS) that federal agencies must prepare and circulate for public review and comment. An EIS is required for all "major Federal actions significantly affecting the quality of the human environment." 42 U.S.C.§ 4332 (2)(C); 40 C.F.R.§ 1501.4 "Major Federal actions" include those undertaken or financed by federal agencies. 40 C.F.R. §1508.18 (a). Federal agencies must prepare an EIS prior to initiating any major federal action so that environmental impacts can be considered and disclosed to the public during the decision-making process. 40 C.F.R. §§1501.2, 1502.5. In this document, the federal agency must identify direct, indirect, and cumulative impacts of the proposed and any connected actions, consider alternative actions and their impacts, and identify all irreversible and irretrievable commitments of resources associated with the action. 42 U.S.C. §4332(2). This requirement is commonly referred to as the agency's duty to take a "hard look" at the environmental impacts of its proposed action. The federal agency must also identify and evaluate the effectiveness and feasibility of any mitigation measures for alleviating identified impacts from the proposed action. 40 C.F.R. §§1502.14(f), 1502.15(h).

CCCW does not feel it is in the nature of a "hard look" to push transmission impact analysis to a site-specific NEPA analysis for specific projects. The reasoning is three-fold:

(1) If any of the action alternatives is selected in the Final PEIS, the percentage of public lands available for utility-scale solar development is reduced. Incentives limit developers to designated SEZs, forcing as yet unplanned transmission with unknown environmental and social impacts to accommodate utility scale developments.

(2) SEZs designated for development in the Final PEIS should be located near load centers and existing transmission to accommodate and ensure that programmatic efforts are developed in compliance with NEPA guidelines for minimizing impacts.

(3) Based on the existing infrastructure, approved transmission corridors, and location of the proposed Los Mogotes East SEZ and the proposed Antonito Southeast SEZ, it is imperative that transmission solutions and corresponding impacts are identified in the Final PEIS, should any of the action alternatives be deemed worthy of consideration.

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NEPA requires agencies to address connected actions in the same impact statement. 40 C.F.R. § 1508.25(a)(1). As the Tenth Circuit has stated:
A connected action is defined as being closely related to other actions and is identified based on three factors:

> (i) Automatically trigger other actions, which may require environmental impact statements.
> (ii) Cannot or will not proceed unless other actions are taken previously or simultaneously.
> (iii) Are interdependent parts of a larger action and depend on the larger action for their justification. 40 C.F.R. § 1508.25(a)(1).

CCCW respectfully recommends:

9) that transmission impacts are given a "hard look" in the Final PEIS as a connected action to this major federal action. BLM and DOE must explain why SEZ designations would be chosen in light of cumulative impacts from transmission development.[14]

10) that the BLM consider additional Zones Plus designations near the City of Pueblo and Colorado Springs on public lands near existing load centers and near adequate transmission.[15]

11) that the BLM and DOE identify and evaluate different infrastructure layouts in the SLV comparing: 1) large utility scale solar development and 2) locally based DG combined with BLM-supported DG capped at Poncha Pass transmission potential, and power storage at all substations.

12) that BLM and DOE require analysis of transportation access for the proposed SEZ designations. The San Luis & Rio Grande rail line ends south of the town of Antonito, approximately 2 miles north of the proposed Antonito Southeast SEZ, and within 250 feet of the Rio San Antonio (The San Antonio River). Riparian impacts of transportation would need to be assessed.

[14] San Luis Valley Solar/Transmission Line Alternatives and Redundancy Recommendations, also know as the "Solar Position Paper" compiled by San Luis Valley Ecosystem Council in cooperation with the Citizens for San Luis Valley Water Protection Coalition, dated June 7, 2010 updated Junuary 14, 2012

[15] *See* Supplement page 1-4, Line 17 – "Optimizing existing transmission infrastructure and corridors," and page 2-30 Line 17 – "In addition, the BLM will encourage local land use planning efforts to consider the need for, and identify as appropriate, new SEZs as part of ongoing land use plan revisions."

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Environmental Justice/ Socioeconomics

(Supplement page 2-1 page 2-3 through 2-4, page C-79, C-82, and page C-97)

Conejos County is an environmental justice community. The proposed SEZs in Conejos County are in environmental justice communities. Approximately sixty percent (60%) of Conejos County's population is minority, and pride in the Hispanic heritage is evident in everything from the names of the rivers, mountains, and towns, to the oldest church in Colorado, Nuestra Señora de Guadalupe, to the first Hispanic labor union in the United States, Sociedad Proteccion Mutua de Trabajadores Unidos (SPMDTU). The median household income is less than half the national average at $24,744, and 38 percent of the children live in poverty (US Census 2000). Conejos County is among the poorest counties in the country, and unemployment levels run above the state and national averages (Conejos County 10.5%; as of 2008 – not including the chronically unemployed).

It is the unfortunate plight of many poor, socioeconomically depressed communities to be forced to choose between their livelihood, sustenance and basic survival and the many intrinsic factors that make them human, such as their culture, heritage and local history. In a more Edenic context, the proposed Antonito Southeast and Los Mogotes East SEZs, in and around poor communities, would provide a means of meaningful, lasting and mutually beneficial revenue sharing, while still being cognizant of cultural landmarks, rich interwoven place and family histories, and the overall identity of the communities being affected.

Put another way, the current proposed Antonito Southeast and Los Mogotes East SEZs in Conejos County, have little in the way of long term or even medium range opportunity for the community. This is true in spite of the program's asking the locals to "give up" their public lands and in some instances their livelihood, i.e. longstanding ranching and grazing on BLM lands, so that a segment of the community can find fleeting relief from the manacles of poverty only to be cast back into the very same financial desperation once the projects on the proposed SEZs end. This proposal creates no infrastructure to sustain meaningful, sustained economic advancement or development. In addition, the proposed sites and their accompanying documents make no mention of cultural artifacts, or historical significance, in and around the proposed Antonito Southeast SEZ, In fact, the cultural and historical value of the area – which has deep and longstanding cultural and historic value for local communities – has not been closely examined.

We request that the DOE, BLM and the corporations considered for development put into motion a sustainable plan for revenue sharing and continued growth. Without such a plan, the development in the proposed SEZs will be, for all intents and purposes, asking the local citizenry to choose between two mutually

exclusive propositions, and will perpetuate and intensify environmental justice concerns.

Fortunately, for environmental justice communities, there is protection under Executive Order 12898 of February 11, 1994, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. BLM and DOE are responsible for identifying and addressing potential disproportionately high and adverse human health and environmental impacts on minority or low-income populations. Minority persons include those who identify themselves as Hispanic or Latino, (race designated as a minority race under Council on Environmental Quality Guidelines [CEQ 1997]). Persons whose income is below the Federal poverty threshold are designated as low income.

Several concerns have been raised that fall under environmental justice consideration with regard to the programmatic effort. There was not an effort for meaningful involvement for residents in Conejos County for the Scoping Comments, Draft, or Supplement; instead, all such public involvement occurred in Alamosa County in Alamosa, Colorado, which is approximately 30 miles north of Antonito. Some community members in Conejos County work out of town during the week, and are too tired or unable to drive all the way to Alamosa. Programmatic documentation was inaccessible to the majority of residents in Conejos County. Again, CCCW has 402 general members, only 70 of whom having Web access. For those with access to the Internet, the documentation was large and expensive to print out.

Other environmental justice issues include:

- Federal incentivizing of multi-national corporations to develop on nearby public lands,
- Requiring bonding in the customary minimum amount of the project cost,
- Requiring utilization of only vendors proven in the BLM supply chain rather than local vendors who may be capable of fulfilling actual requirements,
- Neglecting to provide a tangible revenue-sharing mechanism to the County and local municipalities.

The programmatic effort disallows the involvement of local contractors and vendors, and puts a burden on County infrastructure such as water, roads, and bridges without offering ways for local communities to recover costs associated with enduring the nearby projects, and ways to sustain or grow local economies.

A final environmental justice issue we raise is the SEZ project impact of minimizing historical, cultural use of the land such as grazing. Conejos County is

composed of 68% public lands; grazing permits on all public lands have been integrated into the way of life in Conejos County for over 150 years.[16]

CCCW recognizes that the people in Conejos County who welcome large-scale utility solar development on public lands do so in anticipation of the socioeconomic benefits the potential projects could bring to Conejos County. Conversely, those who are opposed to large scale solar development on nearby public land do so because the cumulative impacts to culture and environment are not completely understood, and there is an element of historic distrust for federal agencies and for agency actions. This programmatic effort has caused fragmentation in our community, with approximately 15% of people excited about jobs, and others (about 20%) upset about impacts to infrastructure, culture, community, and the lack of access to a meaningful means for sustainable economic growth, further others (approximately 15%) that feel both ways want jobs, but also fear impacts. The remaining 50% seem not to want to weigh in either way for fear of upsetting any segment, or for lack of awareness about the effort

CCCW raises a few concerns regarding impacts to existing industry and sources of revenue to Conejos County, and raises some concerns as to how the actions proposed in the Supplement will impact the economy in Conejos County.

The Cumbres and Toltec Scenic Railroad (C&TS RR) has been designated an Area of Critical and Environmental Concern (ACEC), and is a large employer in the area surrounding the proposed Antonito Southeast SEZ. The ACEC is encompassed in the area proposed in the Antonito Southeast SEZ, including the area East of San Antonio Mountain. The C&TS RR ACEC embraces the area from Ortiz, Colorado to the Colorado / New Mexico border because of the high-value hills with flat open range for wildlife grazing, piñon, juniper, and ponderosa pine forests.

The proposed Los Mogotes East SEZ is also near a designated ACEC: approximately five miles from the proposed Los Mogotes East SEZ. This ACEC is located eight miles southwest of La Jara, where the Conejos River forms its southern boundary. This area was designed as an ACEC due to the critical winter range for big game species. Mountain plover, a BLM sensitive species, nests in this area. The area is characterized by wind sweep, gorgeous views of the Sangre de Cristo mountain range, and a traditional hunting area long cherished by Antonito and Capulin residents.

CCCW observes that development on public lands in proposed SEZs targets multi-national corporations, and leaves minimal room for local contractors and local vendors. The accelerated project schedule promoted by BLM and DOE promotes

[16] *See* Supplement page 2-5 Line 35 – "Notification to Livestock Grazing Operators", and Line 37 – "BLM authorized office will send a certified letter to the permittee/lessee to serve as the 2-year notification of the BLM's potential decision to cancel the permit/lease, in whole or in part, and devote the public land to a public purpose that may preclude livestock grazing."

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minimal local involvement. CCCW recognizes that the Supplement addressed the concern of leasing and phasing, but the root concern remains unaddressed. CCCW proposes that projects on public lands be structured as joint leases with municipalities, using local contractors to the full extent possible, and that the development is spread over 10-20 years to promote sustainable economic growth. [17]

Additionally, CCCW notes that the services, which municipalities of Conejos County would need to provide for, the proposed SEZs are in different parts of Conejos County and would thus strain various parts of the local service infrastructure differently. These differential impacts include schools, health/clinics including emergency services, road and bridge, and other municipal management all without a programmatic legal revenue sharing mechanism in place for local economies. Please note that BLM and DOE should not properly refer to Senate Bill 1775 introduced into the 112th Congress during the first session to promote the development of renewable energy on public lands and for other purposes, as a viable solution to answer revenue sharing questions to the local community. Senate Bill 1775 is not approved, and its future is uncertain.

Tourism, hunting and grazing are critical to the economic development and social stability of our region. People come to Conejos County for the peace and quiet it offers. If development of either of the SEZs occurs, CCCW requests that the following measures be put into effect to protect our already struggling economy.

CCCW respectfully recommends:

13) that DOE and BLM modify the proposed Antonito Southeast SEZ to conform to the final SLV BLM Travel Management Plan (TMP) Environmental Assessment (EA) and objectives which include: strict conformance to Visual Resource Management class objectives, protection of historical and visual values, and protection of National Register eligible cultural resources for C&TS RR.

14) that the Final PEIS SEZ designations not displace traditional hunting areas for local residents of Antonito and Capulin. Hunting offsets costs for food in the winter months.

15) cautious phasing of any solar development on SLV BLM lands, which would promote long-term, locally based jobs in Conejos County. CCCW recommends that BLM lands be developed over a period of 10-20 years.

[17] *See* Supplement page 2-3 Line 25 - "International or domestic experience with solar projects on federal or nonfederal land.", Line 27 – "sufficient capitalization to carry out development", Line 31 – "supply contracts with credible third-party vendors for the manufacture and/or supply of key components for solar project facilities," page 2-4 Line 6 – "…the financial and technical capability of the applicant to construct, operate, maintain and decommission the project," Line 19 – "Performance and Reclamation Bond", and Line 22- "The BLM will require a Performance and Reclamation bond for all solar energy projects to ensure compliance with the terms and conditions of the ROW authorization."

16) that BLM and DOE discuss local job multipliers in considerable detail, and what other local economic multipliers could be expected in Conejos County.

17) that BLM and DOE discuss the economic effects of solar materials created or assembled in the SLV versus those imported from elsewhere.

18) that BLM and DOE consider that local firefighters, first responders, and the La Jara hospital would need to be equipped with the proper gear and training to handle additional general risk and potential hazardous materials incidents, and require that developers offset the associated costs.

19) that BLM and DOE will change the contracting approach to allow for more equitable and appropriate revenue sharing with communities near the SEZs.

20) that BLM and DOE will offer guidance to local communities regarding potentially successful revenue sharing approaches.

21) that BLM and DOE will analyze and report on the socioeconomic impacts of the practice of not allowing local contractors to partner on leasing contracts, and provide analysis of ways to increase local contracting and lease partnerships.

22) that BLM and DOE will discuss what happens to the Payment in Lieu of Taxes (PILT) to Conejos County. PILT are Federal payments to local governments that help offset losses in property taxes due to nontaxable Federal lands within their boundaries. Conejos County received $964,140 in 2011.

23) that BLM and DOE discuss phasing and revenue sharing for the benefit of Conejos County as discussed above, offering guidance on upgrading community services particular to the solar industry.

24) that BLM and DOE consider emphasizing that developers must fund DG projects that would generate abundant power in smaller increments (less than 20MW) on sites on smaller pieces of ground that fit better into existing land use such as irrigation corners (SLV potential 2,500 MW), and sites that are already disturbed, as well as BLM lands. Also, please include smaller sites owned by towns, Conejos County, and school districts that can help reduce electrical costs. See Attachment A for sites identified in Conejos County during a Colorado Renewable Energy Society Workshop in Monte Vista, Colorado November 2011.

25) a phased approach of 10-30 MW per year for 10-20 years, in order to avoid boom-bust cycles and to promote permanent jobs and revenues for Conejos County residents.

26) that BLM and DOE aim first to improve local efficiencies and generate enough power to satisfy local needs, and then build generation up to the total amount that can be transmitted out of the SLV over Poncha Pass.

27) that BLM and DOE encourage formation of a local power authority that can manage and tax power generation, so SLV is not beholden to regional power companies.

That BLM and DOE develop proactive revenue sharing methods so that reasonable funding can go to: Conejos County school districts K-12 and technical training at local colleges; conservation of water, soil, and wildlife habitat; health and human services; and road and bridge mitigations and improvements in Conejos County.

28) that BLM and DOE ensure that all contractors and vendors in Conejos County are trained and registered in the Central Contract Registration (CCR) database, the primary supplier database for the U.S. Federal government, and the Dun and Bradstreet (DUNS) database.

29) that BLM and DOE ensure that all contractors and vendors in Conejos County are engaged in a meaningful way in any site-specific NEPA processes.

Natural Resources

CCCW appreciates the BLM and DOE siting effort that places the proposed SEZs on land with relatively low ecological value to mainstream majority cultures. However, every acre identified in the proposed Los Mogotes East site and the proposed Antonito Southeast site are still part of the greater Conejos County and SLV ecosystem. Every intact acre indicating a healthy ecosystem has high cultural, heritage, and public health value for the people who live in our area.

Geology and Soils

(Supplement page C-85, line 29-31)

CCCW would like to let the BLM and DOE know that soils in the area are shallow. Some residents who have already experienced large scale solar development in the SLV report that there is more sand and dust blowing around near the solar development.

CCCW respectfully recommends:

30) that BLM and DOE prohibit a loss of remaining soil structure by using advanced soil mitigation techniques including carbon-capture mechanisms.

31) that BLM and DOE prohibit typical over-lot grading (100% soil disturbance) and promote conservation of intact patches, stabilizing disturbances immediately, and conserving and reusing all topsoil materials immediately.

32) that BLM and DOE study the patterns of wind, sand and dust deposits in Conejos County and access the negative impacts that large-scale development would impose on the agrarian community.

Water

(Supplement page C-85 through C-86)

CCCW recognizes that water is the most precious natural resource in Conejos County and the SLV. Unfortunately, proposed SEZs such as the Antonito Southeast site and the Los Mogotes East site at the headwaters of the Rio Grande are already dealing with intense competition among potential water users for over-appropriated water supplies, Rio Grande Compact obligations to downstream users, and agricultural water use in the Valley. The biggest question and concern in the largely agrarian community remains: Where will the water come from for any proposed utility scale solar development, whether that development is on private or public land? Local renewable energy planning efforts are focused on center pivot sprinkler irrigation corners and on lands that are going out of agriculture rotation due to state water augmentation laws.[18]

There is a longstanding history of effort at the federal, state and local levels to protect and conserve water interests in the SLV, including:

- The Great Sand Dunes National Park and Preserve Act of 2000,
- CCCW as catalyst for halting a proposal to transfer from truck to rail radioactive, hazardous and toxic waste within 250 feet of the Rio San Antonio (San Antonio River), and
- the Valley's successful legal thwarting of a proposal by American Water Development Incorporated (AWDI) for the right to pump 200,000-acre ft. of water per year from the confined aquifer.

The large scale utility projects that would be developed on designated SEZs raise particular concerns for residents in Conejos County, especially any large scale solar

[18] Finley, "Water worries in Colorado's San Luis Valley come to surface." Online at: http://www.denverpost.com/news/ci_19756115#ixzz1jkYpi57G.

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thermal proposals with regard to the introduction of heavy oils for heat transfer; the introduction of ethylene glycol to stop water from freezing, and other types of potential spillage associated with development, including eutectic salts used in Concentrated Solar Power (CSP) technology.

CCCW's final concern regarding water availability leads to questions about converting an Agricultural water right into Municipal and Industrial (M &I) use, which could be the case with utility scale solar development. Once that change in water right occurs, it will remain in use for industrial scale purposes because it will no longer be economically feasible for it to return to agriculture. In viewing this scenario long term, it's important for BLM and DOE to understand that such designations essentially remove water from SLV's traditional water cycle usages in perpetuity.

CCCW agrees with BLM's and DOE's proposed call for low-water use facilities only, and thank the BLM and DOE for avoiding wetlands and open water.

CCCW respectfully recommends:

33) the Final PEIS develop water-wise guidelines for solar development, so that the agency and the concerned public can see the tradeoffs involved in proposed use of limited fresh water. It is imperative that the BLM be cautious about protecting these groundwater systems, so that they'll remain intact for traditional agricultural and cultural use for future generations.

34) that the BLM and DOE ensure that all renewable energy development in Conejos County:

- does not put at risk our critically important aquifer, wetlands and other water sources that support migratory waterfowl, diverse ecosystems, historical and vital water-intensive agricultural uses;
- does not in particular deplete the extensive but fragile aquifers that support these values, which CCCW and the citizens of the SLV have worked long and hard to protect.

35) that DOE and BLM quantify the impact of the future use of converted M & I water rights, especially where technological changes will occur that render these utility scale solar facilities obsolete.

Vegetation/Landscape/Reclamation
(Supplement pages C-86 through C-90)

It is very difficult to xeriscape in Conejos County and the SLV, which is a sub-alpine desert with fragile native and introduced vegetation. Preservation of the following native vegetation is important: piñon-juniper shrublands, ponderosa pine (higher elevation-near Forest BLM boundary). Reclamation was a concern raised at the forum CCCW hosted on January 14, 2012. Dust, sand and air quality are major issues of concern to communities in Conejos County and the SLV.

CCCW respectfully recommends:

36) that BLM and DOE develop conservation guidelines that include native buffer strips and shrub windrows. It's important to maintain native vegetation along solar-panel drip lines.

Air Quality
(Supplement page C-90)

CCCW respectfully recommends:

37) that BLM and DOE prohibit over-lot grading, promote conservation of existing soils and vegetation, use dust inhibitors on open ground, and evaluate potential wildfire impacts of burning solar equipment on air quality.

38) that BLM and DOE furnish and install AIRNET air monitoring stations in the incorporated municipalities of Antonito, Romeo, Manassa, Sanford, and La Jara; collect particulate matter data; and monitor associated public health metrics with regard to the impact on asthma and other respiratory diseases in Conejos County.

Wildlife
(Supplement page C-85, C-87 through C-89)

Conejos County has enormous wildlife values that should not be reduced or degraded. Both SEZs in Conejos County would impact open range for large mammal movement. Solar development should be coordinated with wildlife conservation.

The Conejos County region is known for its game animal hunting grounds, and CCCW appreciates that the BLM and DOE assess any impacts to game animals, such as disruptions to elk rut and calving. These sensitive cycles for the elk population are so

significant, widely appreciated, and well-known that particular roads are closed throughout Colorado during certain times of the year, particularly in the Spring, specifically to protect the calving areas, as tranquility during this time is critical for their survival.

The proposed Antonito Southeast site contains a plethora of wildlife resources including; Elk Overall Range, Elk Winter Range, Elk Severe Winter Range, Gunnison's Prairie Dog Colonies, Gunnison's Prairie Dog Overall Range, Mountain Lion Overall Range, Mule Deer Overall Range, Mule Deer Winter Range, Pronghorn Overall Range, Pronghorn Winter Range, Wildlife Linkage Corridor, Bald Eagle Winter, Bald Eagle Winter Range, and Black Bear Overall Range. The Los Mogotes East site includes; Elk Overall Range, Elk Winter Range, Elk Severe Winter Range, Gunnison's Prairie Dog Colonies, Gunnison's Prairie Dog Overall Range, Mountain Lion Overall Range, Mule Deer Overall Range, Mule Deer Winter Range, Pronghorn Overall Range, Pronghorn Winter Range, Wildlife Linkage Corridor, Bald Eagle Winter, Bald Eagle Winter Range, and Black Bear Overall Range. CCCW supports preservation of the winter wildlife range, mating grounds, and birthing grounds.[19]

CCCW respectfully recommends:

39) that BLM and DOE consider restricting the size and siting of the proposed Los Mogotes East and Antonito Southeast SEZs to preserve the winter wildlife range, mating grounds, and birthing grounds.

40) that BLM and DOE develop a conservation design to promote continuous wildlife movement across SEZs, maintain pods of conservation habitat within solar facilities, and evaluate impacts of high-flying waterfowl mistaking solar facilities as water bodies, along with a mitigation plan if impacts are identified.

Natural History and Cultural Resources Management

(Supplement page 2-7, page 2-13, page 2-17, page 2-20, page 2-23, and pages C-96 through C-97)

Conejos County has enormous natural history values including being part of the Sangre de Cristo NHA, and long human use. The mission of the NHA is to promote, preserve, protect and interpret profound historical, religious, environmental, geographic, geologic, cultural and linguistic resources. These efforts will contribute to the overall national story, engender a spirit of pride and self-reliance in local

[19] Attachment B - Species Data focus on 4 Solar Study Areas in the San Luis Valley totaling Approx. 22,000 acres, Areas include: **Detilla Gulch**-1520 acres, **Four Mile East**-3,878 acres, **Los Mogotes East**-5,905 acres and **Antonito South East**- 9,591 acres compiled by San Luis Valley Ecosystem County for the Draft Solar PEIS.

communities, and create a legacy in the Colorado counties of Alamosa, Conejos, and Costilla.

The geologic resources found in the NHA are directly associated with human habitation. The layered water systems first brought in game that attracted many Native tribes to the area over 12,000 years ago.

Hispanic settlers from the south were enticed to raise crops and sheep through land grants under Mexican communal law, a practice that was adopted under Spanish reign and continued when Mexico won its independence from Spain, to settle the region the NHA presently encompasses. When the Mexican-American war ended in 1848 and the territory was ceded to the United States with the signing of the Treaty of Guadalupe Hidalgo, the Conejos Land Grant (which includes present day Conejos County, Rio Grande County and portions of Alamosa County and Saguache County) was the only land grant that was petitioned for a patent and denied in its entirety.[20]

Subsequently, homesteading that began in 1861 brought Anglo influence to the area, and largely changed the trade and barter system to a currency economy. Hispanic and Anglo ranchers and farmers raised cattle and wheat, and have progressed to present-day crops of alfalfa, potatoes, and lettuce. The geographic isolation of the area has essentially preserved cultural identity of these rural communities.

This NHA includes the oldest Catholic parish in Colorado (Nuestra Señora de Guadalupe) in Conejos County, and the water with the oldest water rights in Colorado. To ensure the preservation of culture of the Conejos County population, it is important to capture the story of the land that is encompassed in the proposed Antonito Southeast SEZ and the proposed Los Mogotes East SEZ. It is important that the area be surveyed and ethnographically studied prior to final SEZ designation.

Recently, the National Park Service under the U.S. Department of the Interior convened with Colorado elected officials in Alamosa, Colorado. A study was proposed to determine the cultural resource value in several Counties in the SLV for a National Park designation. The counties named included Conejos County.[21]

The proposed Antonito Southeast site has traditional uses that follow the wildlife corridor's hunting, grazing and fuel gathering uses by people of Conejos County for more than 150 years. A CCCW group member shared pictures for the purpose of bringing awareness to the BLM about the cultural resource value that exists within the proposed Antonito SEZ, which is within the vicinity of the historic Old Spanish Trail.

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[20] McCourt, "*The Conejos Land Grant Southern Colorado"*, Colorado Magazine, Vol. 52 (1975): 36-51.
[21] San Luis Valley and Central Sangre de Cristo Mountains Reconnaissance Survey Report December 2011, online at: http://parkplanning.nps.gov/document.cfm?parkID=73&projectID=39991&documentID=44749

Please see Attachment C for cultural resource value and note the BLM is amenable to moving any sort of development five miles away from historical trails.[22]

CCCW respectfully requests:

41) that BLM and DOE acknowledge the area is part of a Mexican Land Grand: Los Conejos.

42) that BLM's and DOE's efforts assure that all development is done with respect to natural history and cultural values by performing complete cultural surveys and ethnographic studies of the proposed Antonito SEZ prior to SEZ designation, including utilizing local cultural authors and artists to capture the story. There are deep community concerns with accelerated project schedules and qualitative analysis completed to date which lack important documentation of natural resource and historic value.[23]

43) that BLM and DOE make concerted efforts to conserve areas of moderate to high probability of natural and cultural resources such as the proposed Antonito SEZ, including utilization of local artists and cultural authors to capture the story.[24]

44) that SEZ designations or developments not displace any historic grazing on BLM lands.

45) that BLM's Resource Management Plan (RMP) for the SLV meticulously honors the five-mile radius surrounding historic trails.

46) that SEZ designation not conflict with the *San Luis Valley and Central Sangre de Cristo Mountains Reconnaissance Survey Report, December 2011*.[25]

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[22] Dubois, "*BLM to expand buffer around historic trails from a quarter-mile to five miles",* The Westerner, online at: http://thewesterner.blogspot.com/2012/01/blm-to-expand-buffer-around-historic.html

[23] *See* Supplement page 2-17 "***#21 Areas with important cultural and archaeological resources, such as traditional cultural properties and Native American sacred sites, as identified through consultation and recognized by the BLM.",*** page 2-20 Line 18 – "…future reviews of applications within SEZs can tier to that NEPA analysis, thereby limiting the required scope and effort of additional project-specific NEPA analyses. Tiering is defined as using the coverage of general matters in broader NEPA documents in subsequent, narrower NEPA documents. This allows the tiered NEPA document to concentrate solely on the issues not already addressed.", Line 24 –"The extend of this tiering, however, will vary from project to project, as will the necessary level of NEPA documentation.", page 2-23 Line 1 – "SWCA Environmental Consultants to produce an ethnographic overview of six Tribes within the Great Basin region with cultural and historic ties to SEZs in Nevada and Utah.", page 2-23 Facilitate Faster and Easier Permitting in SEZs Line 41 – "The BLM will adhere internally to strict schedules for the completion of environmental reviews for applications in SEZs…."

[24] *See* Supplement page 2-7 Line 39 – "the BLM may also require bond coverage for all expenses tied to cultural resources identification, protection, and mitigation. This may include, but is not limited to, costs associated with ethnographic studies, inventory, testing, geomorphological studies, data recovery, compensatory mitigation…", page 2-13 Line - 27 "… recognizing that data regarding the actual impacts of solar energy development on various resources are still limited…will develop and incorporate into its Solar Energy Program an adaptive management and monitoring plan to ensure that data and lessons learned about the impacts of solar energy projects will be collected, reviewed, and, as appropriate, incorporated into the BLM's Solar Energy Program in the future."

[25] San Luis Valley and Central Sangre de Cristo Mountains Reconnaissance Survey Report December 2011, online at: http://parkplanning.nps.gov/document.cfm?parkID=73&projectID=39991&documentID=44749

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Visual Impacts
(Supplement pages C-90 through C-91)

CCCW supports the BLM's and DOE's decision to avoid high-visual-profile "power tower" type technologies. Please see ***Environmental Justice/Socioeconomics*** on pages 13-18 of this comment for a distribution of *Visual Impacts* to the C&TS RR, and Conejos County's local economy.

Cumulative Impact Considerations/Public Health
(Supplement page 2-20, 2-23 page C-97)

CCCW respectfully requests that any SEZ development adequately address the health impacts from exposure to electromagnetic frequencies and hazardous materials incidents (including from CSP), by including protective buffers around facilities and transmission lines, by developing proper guidelines for distances from homes, schools, etc., by defining potential transmission corridors that avoid homes, schools, etc., and by developing guidelines for community zoning to properly maintain protections. There are widespread concerns about accelerated project schedules and qualitative analysis completed to date, which precluded the importance of promoting meaningful public involvement in the environmental justice community of Conejos County.[26]

CCCW respectfully requests:

47) that BLM and DOE not adhere to strict accelerated SEZ development schedules in environmental justice communities such as Conejos County; rather, the priority should be to focus on meaningful community involvement and engagement in our rural community, coordinated through Andrew Archuleta, BLM SLV Field Manager.

Conclusions

CCCW respectfully requests that a representative from the Town of Antonito (Mayor Mike Trujillo, townofantonito@hotmail.com, 719.376.2012), the Town of Romeo (Mayor Don Martinez, romeo@centurytel.net, 719.843.5785), the Town of Manassa (Mayor Joe Mestas, townofmanassa@gmail.com, 719.843.5207), and the Conejos County Board of Commissioners (County Administrator Tresessa Martinez, 719.376.5772) be invited to be cooperating agency officials for either further NEPA

[26] *See* Supplement page 2-20 Line 18 – "…future reviews of applications within SEZs can tier to that NEPA analysis, thereby limiting the required scope and effort of additional project-specific NEPA analyses. Tiering is defined as using the coverage of general matters in broader NEPA documents in subsequent, narrower NEPA documents. This allows the tiered NEPA document to concentrate solely on the issues not already addressed.", Line 24 –"The extend of this tiering, however, will vary from project to project, as will the necessary level of NEPA documentation", page 2-23 Facilitate Faster and Easier Permitting in SEZs Line 41 – "The BLM will adhere internally to strict schedules for the completion of environmental reviews for applications in SEZs…."

analysis for SEZs or site-specific projects within any SEZ designation in Conejos County. CCCW understands it is BLM's internal policy to invite elected officials to participate in NEPA as a cooperating agency.

Thank you for your careful consideration of CCCW's concerns and recommendations. Please keep us informed of any upcoming public meetings in the SLV and Conejos County, and use us as a resource to connect you to resources in Conejos County. We can be reached via email at info@conejoscountycleanwater.org or via phone at 720-939-9948.

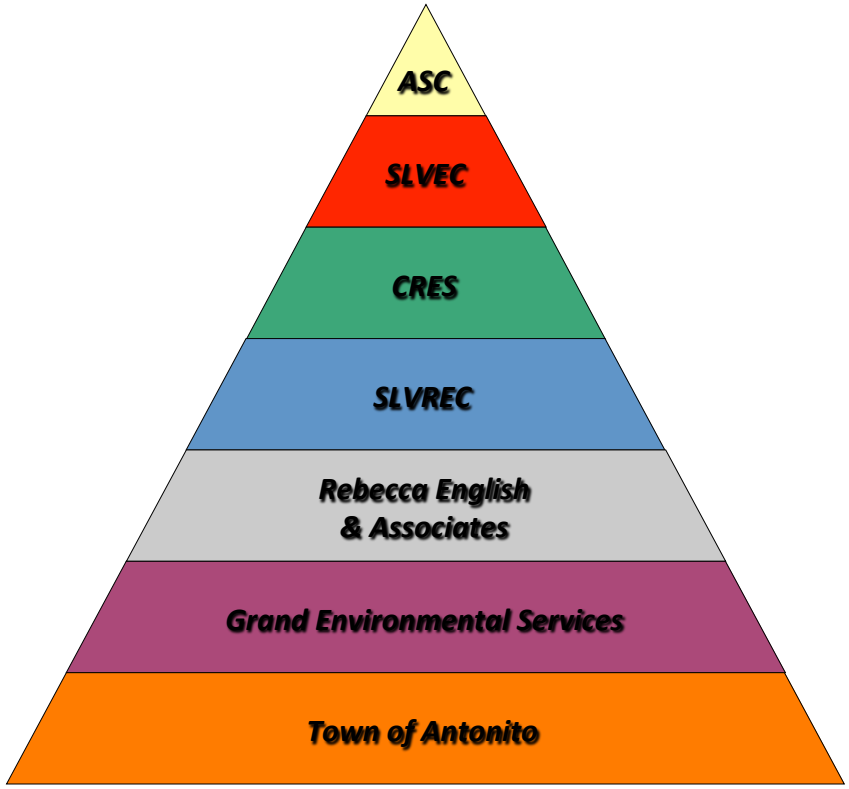
Respectfully submitted,

Andrea T. Guajardo, CCCW Director

Cc:
Gail Schwartz – State Senator
Ed Vigil – State Representative
Erin Minks – Representative for U.S. Senator Mark Udall
Brenda Felmlee – Representative for U.S. Congressman Scott Tipton
Charlotte Bobicki – Representative for U.S. Senator Michael Bennet
Steve McCarroll – Conejos County Commissioner
Mike Trujillo – Antonito Town Mayor
Don Martinez – Romeo Town Mayor
Joe Mestas – Manassa Town Mayor
Alicia Beat- BLM Archaeologist
Andrew Archuleta – BLM
Joe Vieira – BLM

Attachment A

Renewable Energy Planning – Colorado Renewable Energy Society (CRES)



- The Town of Antonito was a case study in November 2011 for a Colorado Renewable Energy Society (CRES) workshop in Monte Vista, Colorado.
- The sites in the following pages were discussed as well as a site adjacent to the proposed Antonito Southeast SEZ that is designated Sections 18 & 36 property, giving revenues to local schools.
- CCCW helped the Town of Antonito identify the sites for discussion at the workshop.

Proposed Renewable Energy Park – site (1) - Antonito Wastewater Treatment Facility

Photo credit: Mike Trujillo

- Identified as a good site for mixed use DG renewable energy development.
- The site is approximately 40 acres.
- The Antonito substation is directly across the street to the west.
- This site is approximately one mile north of the proposed Antonito Southeast SEZ.
- First project is a Community Solar Garden under the state of Colorado policy signed in 2010.

Proposed Renewable Energy Park – site (1) - Antonito Wastewater Treatment Facility

Photo credit: Mike Trujillo

- This is the substation that is at the end of existing transmission in the SLV.
- The transmission feeding this substation is 69kV.
- This substation is approximately 3 miles north of the proposed Antonito Southeast SEZ.
- This substation is directly across the street from the Antonito wastewater treatment facility.

Renewable Energy Planning – site (2) – Valle Escondido Ranch

- Case study – Valle Escondido Ranch
- Identified as a good site for small utility scale solar during CRES workshop (8 MW).
- Approximately 80 acres is presently for sale.
- This site is approximately one mile north of the proposed Antonito Southeast SEZ.

Photo credit: Mike Trujillo

Renewable Energy Planning – site (3) – Abeyta Ranch Center Pivot Sprinkler corners

Photo credit: Mike Trujillo

- Identified for future solar development to offset demand charges on corners while agriculture use remains.
- Approximately two miles north of the proposed Antonito Southeast SEZ.
- Corner capacity in the SLV has been identified by Colorado Harvesting Energy Network to have a 2,500 MW resource value.

Renewable Energy Planning – site (4) – South Conejos School District

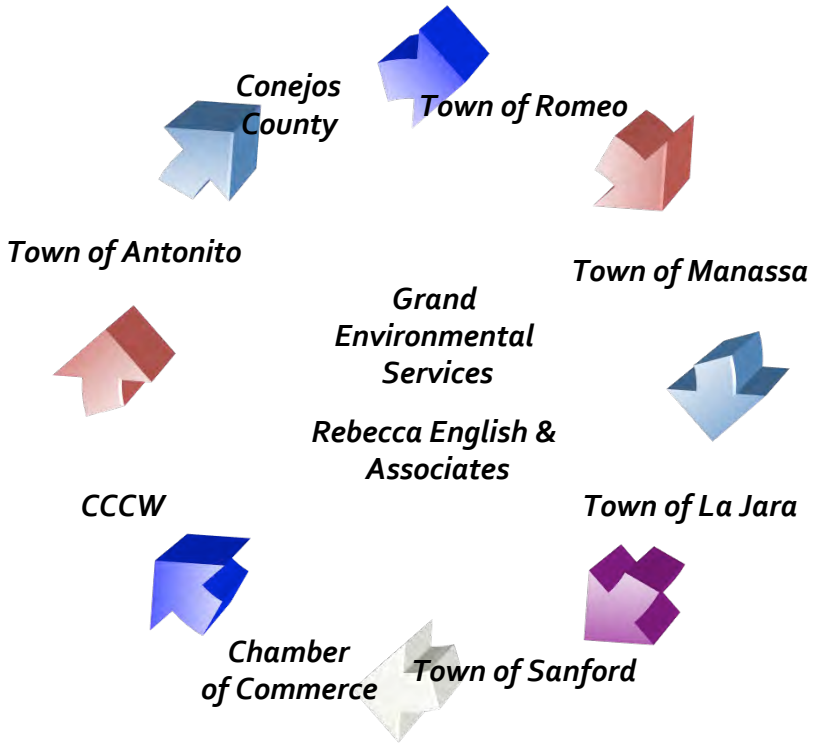
- Case study – South Conejos School District
- Lot was identified as a great location to elevate panels above parking.
- Create shade for a summer farmers' market.
- Approximately four miles north of proposed Antonito Southeast SEZ.

Photo credit: Mike Trujillo

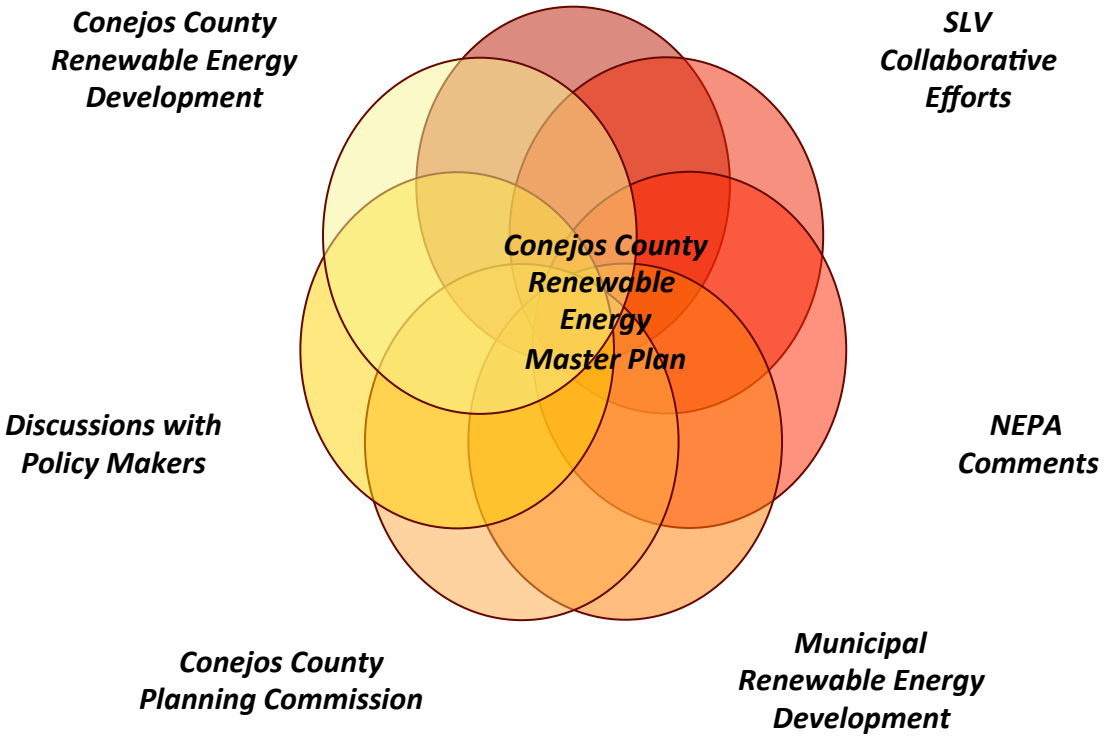
CCCW Would like to initiate the following collaborative planning effort in Conejos County during 2012

Potential Key Stakeholders:

- Town of Antonito
- Town of Romeo
- Town of Manassa
- Town of La Jara
- Town of Sanford
- Conejos County
- Chamber of Commerce
- Conejos County
- CCCW



Potential Utilization of Conejos County Renewable Energy Working Group Information



Attachment B

Species Data focus on 4 Solar Study Areas in the San Luis Valley totaling Approx. 22,000 acres, Areas include: **Detilla Gulch**-1520 acres, **Four Mile East**-3,878 acres, **Los Mogotes East**-5,905 acres and **Antonito South East**- 9,591 acres

Species	Detilla Gulch	Four Mile East	Los Mogotes East	Antonito Southeast	Miles in Length/Width
Elk Overall Range	Entire Study Area	Entire Study Area	Entire Study Area	Entire Study Area	
Elk Winter Range	496 Acres Along Hwy 285 2.75 mi	None	Entire Study Area 5,737 acres	5,442 Acres Western Half- 3.47 miles	
Elk Severe Winter Range	Same Area as winter range above	None	Entire Study Area	Same area as Winter range above	
Elk Summer Range	None	213 Acres NE Quadrant	None		.60 miles long .98 miles width
Gunnison's Prarie Dog Colonies	2 Areas 1. Along Hwy 285 2.05 Miles long, .23 miWidth, 2. entire eastern boundary .47 mi Length-.87 Width	1,016 Acres, 2.42 Mile long, 1.6 mi width Southern Quadrant	518 Acres 2.82 Mile length, .43 mi width Upper left Quadrant	9.48 acres Along western border .42 Mi length .05 mi width	
Gunnison's Prarie Dog Overall Range	Entire Study Area	Entire Study Area	Entire Study Area	Entire Study Area	
Mtn Lion Overall Range	Entire Study Area	Entire Study Area	Entire Study Area	Entire Study Area	
Mule Deer Overall Range	Entire Study Area	Entire Study Area	Entire Study Area	Entire Study Area	
Mule Deer Winter Range	1,127 acres Along Hwy 285 2.73 mi length, .81 width	None	134 acres 1.94 mi length, .15 mi width Western border of Study area	None	
Pronghorn Overall Range	Entire Study Area	Entire Study Area	Entire Study Area	Entire Study Area	
Pronghorn Winter Range	Entire Study Area	Entire Study Area	Entire Study Area	Entire Study Area	
Wildlife Linkage Corridor	Entire Study Area	Entire Study Area	Entire Study Area	Entire Study Area	
Bald Eagle Winter Forage	None	None	None	Entire Study Area	
Bald Eagle Winter Range	746 acres, Eastern border Parcel, 3 mi radius	Entire Study Area	Entire Study Area	Entire Study Area	
Black Bear Overall Range	Entire Study Area	Entire Study Area	Entire Study Area	Entire Study Area	
CNHP Potential CA's	Entire northern portion of study area 1.57 mi width 1.91 mile length	None	None	None	

Attachment C

Vicinity of Proposed Antonito Southeast SEZ - GPS Coordinates

Vicinity of Proposed Antonito Southeast SEZ - GPS Coordinates: Going into Costilla County from Conejos County's County Road G and bearing 1.5 miles East of Kiowa Hill, which is situated at North 37 degrees 05.202'; West 105 degrees 48.337' at elevation of

7754. Structures are said to have been USA Military-built structures built originally to house Japanese Prisoners of War (POW) in the 1940s

Vicinity of Proposed Antonito Southeast SEZ - GPS Coordinates

Signal Hill ¼ mile due East and North from N 37 degrees 05.202’; S 105 degrees 48.337’ at Elevation 7754 feet.

Vicinity of Proposed Antonito Southeast SEZ - GPS Coordinates

At a point approximately 2.5 miles due South from North 37 degrees 02.550’; West 105 degrees 55.671’ at elevation of 7777 feet.

Vicinity of Proposed Antonito Southeast SEZ - GPS Coordinates :

Possible Native American, Spanish, and/or Mexican symbols depicting some type of information is located on the “Picuris Trail”- East of present day La Florida, CO and bears South approximately 2 miles from North 37 degrees 02.550’; West 105 degrees 55.671’ at elevation of 7777 feet.

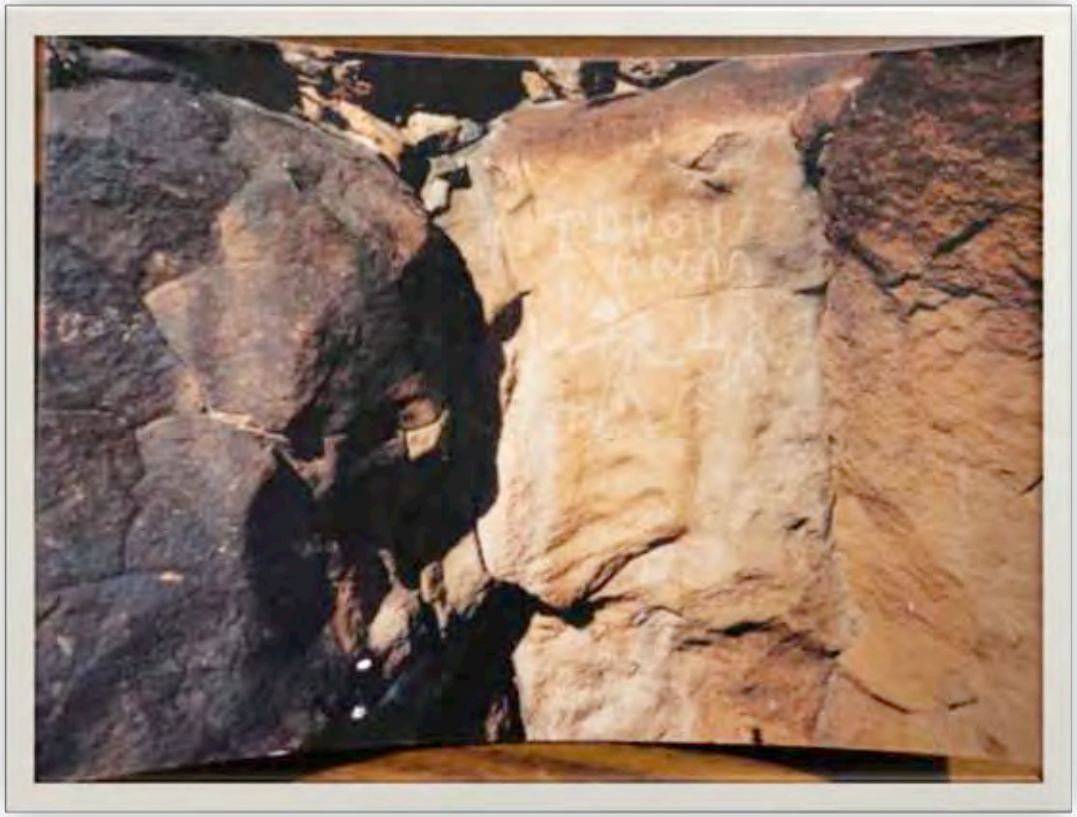
Vicinity of Proposed Antonito Southeast SEZ - GPS Coordinates: Approximately 2 miles from N 37 degrees 02.550’; West 105 degrees 55.671’ at elevation of 7777 feet.

Vicinity of Proposed Antonito Southeast SEZ - GPS Coordinates: rock fissures situated in vicinity of North 37 degrees 05.202’; West 105 degrees 48.337’ at 7754 elevation.

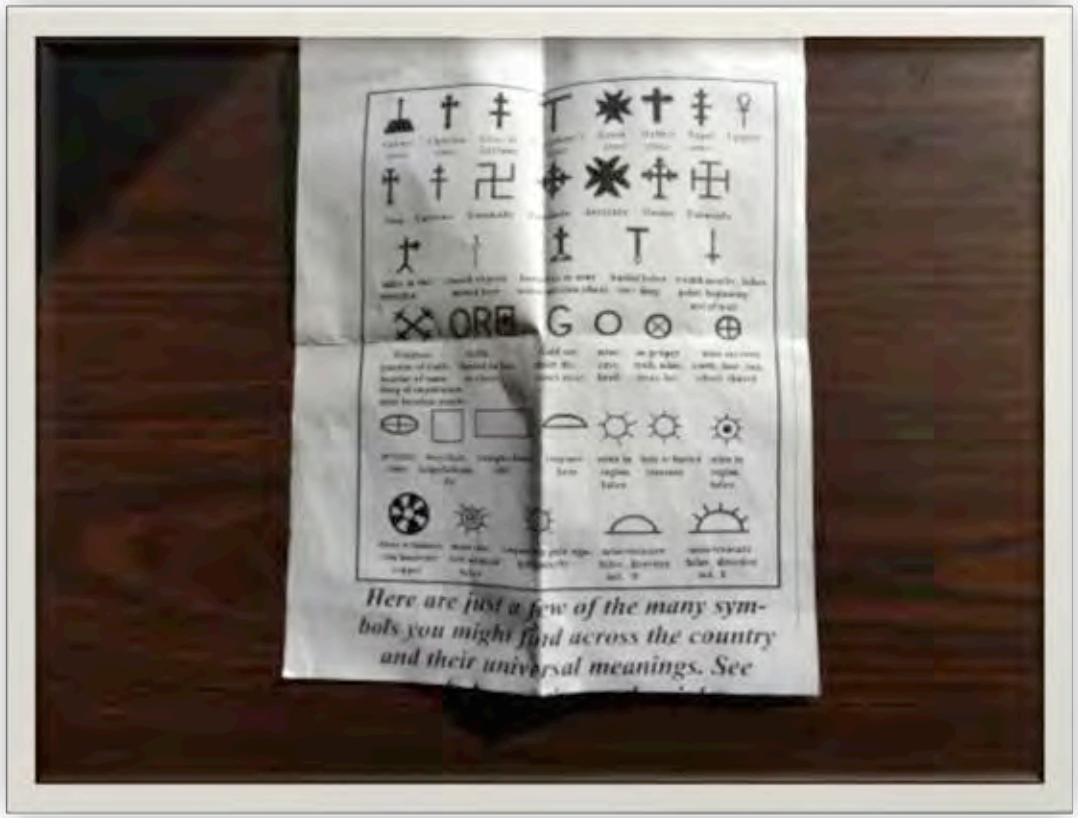
Vicinity of Proposed Antonito Southeast SEZ - GPS Coordinates: situated approximately at North 37 degrees 05.202’ ; West 105 degrees 48.337”.

Vicinity of Proposed Antonito Southeast SEZ - GPS Coordinates: North 37 degrees 05.202’ ; West 105 degrees 48.337’ at 7754 elevation.

Vicinity of Proposed Antonito Southeast SEZ - GPS Coordinates: at Picuris Trail approximately 2 miles from North 37 degrees 02.550’; West 105 degrees 55.671’ at 7777 elevation.



Vicinity of Proposed Antonito Southeast SEZ - GPS Coordinates: N 37 degrees 05.202’ W 105 degrees 48.337” at 7754 elevation.



Symbol meaning

All photos are courtesy of CCCW.

Thank you for your comment, James Thoresen.

The comment tracking number that has been assigned to your comment is SEDDsupp20121.

Comment Date: January 27, 2012 14:06:47PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20121

First Name: James
Middle Initial: A
Last Name: Thoresen
Organization:
Address: 3210 Brighton Street
Address 2:
Address 3:
City:
State: PA
Zip: 19149
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

The United States currently imports over 1 billion dollars per day in foreign oil. We need all of the enrgy that we can possibly produce domestically (especially renewables), therefore I support all solar / renewable energy that we can produce for our nation on our soils!

Thank you for your comment, Whitney Coombs.

The comment tracking number that has been assigned to your comment is SEDDsupp20122.

Comment Date: January 27, 2012 14:19:50PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20122

First Name: Whitney
Middle Initial:
Last Name: Coombs
Organization: National Wildlife Federation
Address: [Withheld by requestor]
Address 2: [Withheld by requestor]
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold address from public record
Attachment: Supplement_to_Draft_Solar_PEIS_Public_Comments.xls

Comment Submitted:

I am submitting these comments on the behalf of the National Wildlife Federation. They were given by our members in response to an action alert on the Supplement to the Draft Solar PEIS.

Last_Name	First_Name	Street	City	State	ZIP	Response_Date	Comments
Robinson	Ronald	601 W Kings Hwy	Audubon	NJ	08106-2208	1/22/2012 16:48	Thank you for supplementing the Bureau of Land Management's draft proposal for siting new large-scale solar projects on public lands in the West. Please improve and finalize this much-needed program and continue to work to establish wildlife-friendly and consistent rules for developing solar energy on our public lands. The Supplement clearly draws on the input received from conservationists and others. Significant improvements to the draft include the commitment to do more research on wildlife impacts, the pledge to make more sensitive areas off limits to development, and the inclusion of additional incentives to drive development to low-conflict solar energy zones. With some additional work to limit development outside the designated zones and provide adequate mitigation for habitat losses, the proposed solar zoning framework will serve as an effective, strategic roadmap to developing the most appropriate solar resources on public lands. The best path going forward will guide solar development to lands with the highest quality solar resource, where the power generated can be delivered easily to consumers, and where there is the lowest potential for conflict with fish, wildlife, access, and other values and uses.
Lewis	Alan	340 Avenida De Las Rosas	Encinitas	CA	92024-4716	1/21/2012 12:41	Thank you for supplementing the Bureau of Land Management's draft proposal for siting new large-scale solar projects on public lands in the West. Please improve and finalize this much-needed program and continue to work to establish wildlife-friendly and consistent rules for developing solar energy on our public lands. The Supplement clearly draws on the input received from conservationists and others. Significant improvements to the draft include the commitment to do more research on wildlife impacts, the pledge to make more sensitive areas off limits to development, and the inclusion of additional incentives to drive development to low-conflict solar energy zones. With some additional work to limit development outside the designated zones and provide adequate mitigation for habitat losses, the proposed solar zoning framework will serve as an effective, strategic roadmap to developing the most appropriate solar resources on public lands. The best path going forward will guide solar development to lands with the highest quality solar resource, where the power generated can be delivered easily to consumers, and where there is the lowest potential for conflict with fish, wildlife, access, and other values and uses.
A	Sandy	Gopher	Saint Paul	MN	55128	1/21/2012 16:37	Thank you for supplementing the Bureau of Land Management's draft proposal for siting new large-scale solar projects on public lands in the West. Please improve and finalize this much-needed program and continue to work to establish wildlife-friendly and consistent rules for developing solar energy on our public lands. The Supplement clearly draws on the input received from conservationists and others. Significant improvements to the draft include the commitment to do more research on wildlife impacts, the pledge to make more sensitive areas off limits to development, and the inclusion of additional incentives to drive development to low-conflict solar energy zones. With some additional work to limit development outside the designated zones and provide adequate mitigation for habitat losses, the proposed solar zoning framework will serve as an effective, strategic roadmap to developing the most appropriate solar resources on public lands. The best path going forward will guide solar development to lands with the highest quality solar resource, where the power generated can be delivered easily to consumers, and where there is the lowest potential for conflict with fish, wildlife, access, and other values and uses.
A'Becket	Suzanne	21163 Patriot Way	Cupertino	CA	95014-5707	1/21/2012 13:50	Thank you for supplementing the Bureau of Land Management's draft proposal for siting new large-scale solar projects on public lands in the West. Please improve and finalize this much-needed program and continue to work to establish wildlife-friendly and consistent rules for developing solar energy on our public lands. The Supplement clearly draws on the input received from conservationists and others. Significant improvements to the draft include the commitment to do more research on wildlife impacts, the pledge to make more sensitive areas off limits to development, and the inclusion of additional incentives to drive development to low-conflict solar energy zones. With some additional work to limit development outside the designated zones and provide adequate mitigation for habitat losses, the proposed solar zoning framework will serve as an effective, strategic roadmap to developing the most appropriate solar resources on public lands. The best path going forward will guide solar development to lands with the highest quality solar resource, where the power generated can be delivered easily to consumers, and where there is the lowest potential for conflict with fish, wildlife, access, and other values and uses.
A'Harrah	Gayle	7-20 Aspen Way	Doylestown	PA	18901-2755	1/21/2012 13:21	Thank you for supplementing the Bureau of Land Management's draft proposal for siting new large-scale solar projects on public lands in the West. Please improve and finalize this much-needed program and continue to work to establish wildlife-friendly and consistent rules for developing solar energy on our public lands. The Supplement clearly draws on the input received from conservationists and others. Significant improvements to the draft include the commitment to do more research on wildlife impacts, the pledge to make more sensitive areas off limits to development, and the inclusion of additional incentives to drive development to low-conflict solar energy zones. With some additional work to limit development outside the designated zones and provide adequate mitigation for habitat losses, the proposed solar zoning framework will serve as an effective, strategic roadmap to developing the most appropriate solar resources on public lands. The best path going forward will guide solar development to lands with the highest quality solar resource, where the power generated can be delivered easily to consumers, and where there is the lowest potential for conflict with fish, wildlife, access, and other values and uses.
ABBEY	BEVERLEY	2246 Emerald Cir	Morro Bay	CA	93442-1588	1/21/2012 20:54	Thank you for supplementing the Bureau of Land Management's draft proposal for siting new large-scale solar projects on public lands in the West. Please improve and finalize this much-needed program and continue to work to establish wildlife-friendly and consistent rules for developing solar energy on our public lands. The Supplement clearly draws on the input received from conservationists and others. Significant improvements to the draft include the commitment to do more research on wildlife impacts, the pledge to make more sensitive areas off limits to development, and the inclusion of additional incentives to drive development to low-conflict solar energy zones. With some additional work to limit development outside the designated zones and provide adequate mitigation for habitat losses, the proposed solar zoning framework will serve as an effective, strategic roadmap to developing the most appropriate solar resources on public lands. The best path going forward will guide solar development to lands with the highest quality solar resource, where the power generated can be delivered easily to consumers, and where there is the lowest potential for conflict with fish, wildlife, access, and other values and uses.
ADAME	MIRIAM	373 Jamaica St	Aurora	CO	80010-4535	1/25/2012 12:57	Thank you for supplementing the Bureau of Land Management's draft proposal for siting new large-scale solar projects on public lands in the West. Please improve and finalize this much-needed program and continue to work to establish wildlife-friendly and consistent rules for developing solar energy on our public lands. The Supplement clearly draws on the input received from conservationists and others. Significant improvements to the draft include the commitment to do more research on wildlife impacts, the pledge to make more sensitive areas off limits to development, and the inclusion of additional incentives to drive development to low-conflict solar energy zones. With some additional work to limit development outside the designated zones and provide adequate mitigation for habitat losses, the proposed solar zoning framework will serve as an effective, strategic roadmap to developing the most appropriate solar resources on public lands. The best path going forward will guide solar development to lands with the highest quality solar resource, where the power generated can be delivered easily to consumers, and where there is the lowest potential for conflict with fish, wildlife, access, and other values and uses.
ADAMS	SPENCER	3707 Clarington Ave	Los Angeles	CA	90034-5843	1/21/2012 15:30	Thank you for supplementing the Bureau of Land Management's draft proposal for siting new large-scale solar projects on public lands in the West. Please improve and finalize this much-needed program and continue to work to establish wildlife-friendly and consistent rules for developing solar energy on our public lands. The Supplement clearly draws on the input received from conservationists and others. Significant improvements to the draft include the commitment to do more research on wildlife impacts, the pledge to make more sensitive areas off limits to development, and the inclusion of additional incentives to drive development to low-conflict solar energy zones. With some additional work to limit development outside the designated zones and provide adequate mitigation for habitat losses, the proposed solar zoning framework will serve as an effective, strategic roadmap to developing the most appropriate solar resources on public lands. The best path going forward will guide solar development to lands with the highest quality solar resource, where the power generated can be delivered easily to consumers, and where there is the lowest potential for conflict with fish, wildlife, access, and other values and uses.

Thank you for your comment, Michael Connor.

The comment tracking number that has been assigned to your comment is SEDDsupp20100.

Comment Date: January 26, 2012 23:56:11PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20100

First Name: Michael
Middle Initial: J
Last Name: Connor
Organization: Western Watersheds Project
Address: P.O. Box 2362
Address 2:
Address 3:
City: Reseda
State: CA
Zip: 91335
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: WWP-Lovich&Ennen2011.pdf

Comment Submitted:

Western Watersheds Project is submitting this research paper with its comemts. Thank you.

Wildlife Conservation and Solar Energy Development in the Desert Southwest, United States

JEFFREY E. LOVICH AND JOSHUA R. ENNEN

Large areas of public land are currently being permitted or evaluated for utility-scale solar energy development (USSED) in the southwestern United States, including areas with high biodiversity and protected species. However, peer-reviewed studies of the effects of USSED on wildlife are lacking. The potential effects of the construction and the eventual decommissioning of solar energy facilities include the direct mortality of wildlife; environmental impacts of fugitive dust and dust suppressants; destruction and modification of habitat, including the impacts of roads; and off-site impacts related to construction material acquisition, processing, and transportation. The potential effects of the operation and maintenance of the facilities include habitat fragmentation and barriers to gene flow, increased noise, electromagnetic field generation, microclimate alteration, pollution, water consumption, and fire. Facility design effects, the efficacy of site-selection criteria, and the cumulative effects of USSED on regional wildlife populations are unknown. Currently available peer-reviewed data are insufficient to allow a rigorous assessment of the impact of USSED on wildlife.

Keywords: solar energy development, Mojave Desert, Sonoran Desert, wildlife, desert tortoises

The United States is poised to develop new renewable energy facilities at an unprecedented rate, including in potentially large areas of public land in the Southwest. This quantum leap is driven by escalating costs and demand for traditional energy sources from fossil fuels and by concerns over global climate change. Attention is focused largely on renewable forms of energy, especially solar energy. The potential for utility-scale solar energy development (USSED) and operation (USSEDO) is particularly high in the southwestern United States, where solar energy potential is high (USDOI and USDOE 2011a) and is already being harnessed in some areas. However, the potential for USSEDO conflicts with natural resources, especially wildlife, is also high, given the exceptional biodiversity (Mittermeier et al. 2002) and sensitivity (Lovich and Bainbridge 1999) of arid Southwest ecosystems, especially the Mojave (Randall et al. 2010) and Sonoran Deserts, which are already stressed by climate and human changes (CBI 2010). In addition, the desert Southwest is identified as a "hotspot" for threatened and endangered species in the United States (Flather et al. 1998). For these reasons, planning efforts should consider ways to minimize USSEDO impacts on wildlife (CBI 2010). Paradoxically, the implementation of large-scale solar energy development as an "environmentally friendly" alternative to conventional energy sources may actually increase environmental degradation on a local and on a regional scale (Bezdek 1993, Abbasi and Abbasi 2000) with concomitant negative effects on wildlife.

A logical first step in evaluating the effects of USSEDO on wildlife is to assess the existing scientific knowledge. As renewable energy development proceeds rapidly worldwide, information is slowly accumulating on the effects of USSEDO on the environment (for reviews, see Harte and Jassby 1978, Pimentel et al. 1994, Abbasi and Abbasi 2000). Gill (2005) noted that although the number of peer-reviewed publications on renewable energy has increased dramatically since 1991, only 7.6% of all publications on the topic covered environmental impacts, only 4.0% included discussions of ecological implications, and less than 1.0% contained information on environmental risks. A great deal of information on USSEDO exists in environmental compliance documents and other unpublished, non-peer-reviewed "gray" literature sources. Published scientific information on the effects on wildlife of any form of renewable energy development, including that of wind energy, is scant (Kuvlesky et al. 2007). The vast majority of the published research on wildlife and renewable energy development has been focused on the effects of wind energy development on birds (Drewitt and Langston 2006) and bats (Kunz et al. 2007) because of their sensitivity to aerial impacts. In contrast, almost no information is available on the effects of solar energy development on wildlife.

From a conservation standpoint, one of the most important species in the desert Southwest is Agassiz's desert

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tortoise (*Gopherus agassizii*; figure 1). Distributed north and west of the Colorado River, the species was listed as *threatened* under the US Endangered Species Act in 1990. Because of its protected status, Agassiz's desert tortoise acts as an "umbrella species," extending protection to other plants and animals within its range (Tracy and Brussard, 1994). The newly described Morafka's desert tortoise (*Gopherus morafkai*; Murphy et al. 2011) is another species of significant conservation concern in the desert Southwest, found east of the Colorado River. Both tortoises are important as ecological engineers who construct burrows that provide shelter to many other animal species, which allows them to escape the temperature extremes of the desert (Ernst and Lovich 2009). The importance of these tortoises is thus greatly disproportionate to their intrinsic value as species. By virtue of their protected status, Agassiz's desert tortoises have a significant impact on regulatory issues in the listed portion of their range, yet little is known about the effects of USSEDO on the species, even a quarter century after the recognition of that deficiency (Pearson 1986). Large areas of habitat occupied by Agassiz's desert tortoise in particular have potential for development of USSED (figure 2).

Figure 1. Agassiz's desert tortoise (*Gopherus agassizii*). Large areas of desert tortoise habitat are developed or being evaluated for renewable energy development, including for wind and solar energy. Photograph: Jeffrey E. Lovich.

In this article, we review the state of knowledge about the known and potential effects, both direct and indirect, of USSEDO on wildlife (table 1). Our review is based on information published primarily in peer-reviewed scientific journals for both energy and wildlife professionals. Agassiz's desert tortoise is periodically highlighted in our review because of its protected status, wide distribution in areas considered for USSEDO in the desert Southwest, and well-studied status (Ernst and Lovich 2009). In addition, we identify gaps in our understanding of the effects of USSEDO on wildlife and suggest questions that will guide future research toward a goal of mitigating or minimizing the negative effects on wildlife.

Background on proposed energy-development potential in the southwestern United States

The blueprint for evaluating and permitting the development of solar energy on public land in the region, as is required under the US National Environmental Policy Act (USEPA 2010), began in a draft environmental impact statement (EIS) prepared by two federal agencies (USDOI and USDOE 2011a). The purpose of the EIS is to "develop a new Solar Energy Program to further support utility-scale solar energy development on BLM [US Bureau of Land

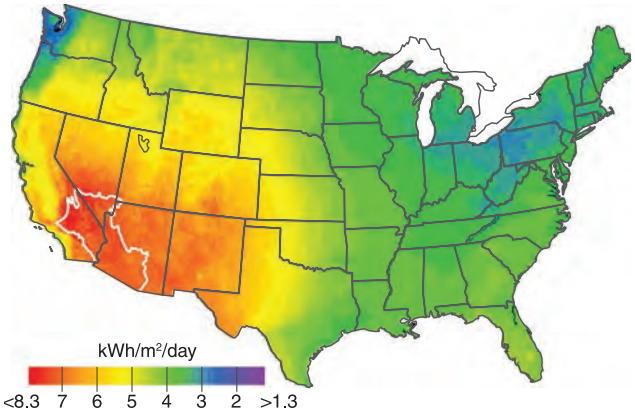

Figure 2. Concentrating solar energy potential (in kilowatt-hours per square meter per day [kWh/m²/day]) of the United States. The map shows the annual average direct normal solar resource data based on a 10-kilometer satellite-modeled data set for the period from 1998 to 2005. Refer to NREL (2011) for additional details and data sources. The white outline defines the approximate composite ranges of Agassiz's (west of the Colorado River) and Morafka's (east of the Colorado River) desert tortoises (Murphy et al. 2011) in the United States, both species of significant conservation concern. This figure was prepared by the National Renewable Energy Laboratory for the US Department of Energy (NREL 2011). The image was authored by an employee of the Alliance for Sustainable Energy, LLC, under Contract no. DE-AC36-08GO28308 with the US Department of Energy. Reprinted with permission from NREL 2011.

Table 1. List of known and potential impacts of utility-scale solar energy development on wildlife in the desert Southwest.

Impacts due to facility construction and decommissioning	Impacts due to facility presence, operation, and maintenance
Destruction and modification of wildlife habitat	Habitat fragmentation and barriers to movement and gene flow
Direct mortality of wildlife	Noise effects
Dust and dust-suppression effects	Electromagnetic field effects
Road effects	Microclimate effects
Off-site impacts	Pollution effects from spills
Destruction and modification of wildlife habitat	Water consumption effects
	Fire effects
	Light pollution effects, including polarized light
	Habitat fragmentation and barriers to movement and gene flow
	Noise effects

Management] -administered lands… and to ensure consistent application of measures to avoid, minimize, or mitigate the adverse impacts of such development" (p. ES-2). As of February 2010, the BLM had 127 active applications for solar facilities on lands that the BLM administers. According to USDOI and USDOE (2011a), all of the BLM-administered land in six states (California, Arizona, Utah, Nevada, New Mexico, and Colorado) was considered initially, for a total of 178 million hectares (ha). Not all of that land is compatible with solar energy development, so three alternative configurations are listed by USDOI and USDOI (2011a) for consideration, ranging from 274,244 to 39,972,558 ha. The larger figure is listed under the *no action alternative* where BLM would continue to use existing policy and guidance to evaluate applications. Of the area being considered under the two action alternatives, approximately 9 million ha meet the criteria established under the BLM's preferred action alternative to support solar development. Twenty-five criteria were used to exclude certain areas of public land from solar development and include environmental, social, and economic factors. The preferred alternative also included the identification of proposed *solar energy zones* (SEZs), defined as "area[s] with few impediments to utility-scale production of solar energy" (USDOI and USDOE 2011a, p. ES-7). By themselves, these SEZs constitute the nonpreferred action alternative of 274,244 ha listed above. Maps of SEZs are available at *http://solareis.anl.gov/documents/dpeis/index.cfm*.

Several sensitive, threatened, or endangered species are being considered within the EIS, but Agassiz's desert tortoise is one of only four species noted whose very presence at a site may be sufficient to exclude USSED in special cases (see table ES.2-2 in USDOI and USDOE 2011a). The potential effects of USSEDO are not trivial for tortoises or other wildlife species. Within the area covered in the draft EIS by USDOI and USDOE (2011a), it is estimated that approximately 161,943 ha of Agassiz's desert tortoise habitat will be directly affected. However, when including direct and indirect impacts on habitat (excluding transmission lines and roads that would add additional impacts; see Lovich and Bainbridge 1999, Kristan and Boarman 2007), it is estimated that approximately 769,230 ha will be affected. Some SEZs are adjacent to critical habitat designated for the recovery of Agassiz's desert tortoise, and this proximity is considered part of the indirect impacts.

On 28 October 2011, while this paper was in press, the BLM and US Department of Energy released a supplement to the EIS (USDOI and USDOE 2011b, 2011c) after receiving more than 80,500 comments. The no action alternative remains the same as in the EIS. The new preferred alternative (slightly reduced to 8,225,179 ha as the modified program alternative) eliminates or adjusts SEZs (now reduced to 115,335 ha in 17 zones as the modified SEZ alternative) to ensure that they are not in high-conflict areas and provides incentives for their use. The new plan also proposes a process to accommodate additional solar energy development outside of SEZs and to revisit ongoing state-based planning efforts to allow consideration of additional SEZs in the future.

The impacts of USSED on wildlife: Effects due to construction and decommissioning

The construction and eventual decommissioning of solar energy facilities will have impacts on wildlife, including rare and endangered species, and on their habitats in the desert (Harte and Jassby 1978). These activities involve significant ground disturbance and direct (e.g., mortality) and indirect (e.g., habitat loss, degradation, modification) impacts on wildlife and their habitat (Kuvlesky et al. 2007). Solar energy facilities require large land areas to harness sunlight and convert it to electrical energy. According to Wilshire and colleagues (2008), photovoltaic panels with a 10% conversion efficiency would need to cover an area of about 32,000 square kilometers, or an area a little smaller than the state of Maryland, to meet the current electricity demands of the United States. Many of the areas being considered for the development of solar energy in the Mojave and Sonoran Deserts are, at present, relatively undisturbed (USDOI and USDOE 2011a).

The extent of surface disturbance of USSED is related to the cooling technology used. Because of the scarcity of water in the desert Southwest region, dry-cooling systems, which consume 90%–95% less water than wet-cooling systems (EPRI 2002), are becoming a more viable option for concentrating solar facilities. Although wet-cooling systems are more economical and efficient, they consume larger amounts of water per kilowatt-hour (Torcellini et al. 2003). Unlike wet-cooling systems, dry-cooling systems use ambient air, instead of water, to cool the exhaust steam from the turbines. However, to achieve a heat-rejection efficiency similar to that in a wet-cooling system, Khalil and colleagues (2006) estimated that a direct dry-cooling system will require a larger footprint and would thus affect more wildlife habitat.

Although we found no information in the scientific literature about the direct effects of USSED on wildlife, the ground-disturbance impacts are expected to be similar to those caused by other human activities in the desert (Lovich and Bainbridge 1999).

Dust and dust suppressants. USSED transforms the landscape substantially through site preparation, including the construction of roads and other infrastructure. In addition, many solar facilities require vegetation removal and grading. These construction activities produce dust emissions, especially in arid environments (Munson et al. 2011), which already have the potential for natural dust emission. Dust can have dramatic effects on ecological processes at all scales (reviewed by Field et al. 2010). At the smallest scale, wind erosion, which powers dust emission, can alter the fertility and water-retention capabilities of the soil. Physiologically, dust can adversely influence the gas exchange, photosynthesis, and water usage of Mojave Desert shrubs (Sharifi et al. 1997). Depending on particle size, wind speed, and other factors, dust emission can physically damage plant species through root exposure, burial, and abrasions to their leaves and stems. The physiological and physical damage to plant species inflicted by dust emissions could ultimately reduce the plants' primary production and could indirectly affect wildlife food plants and habitat quality.

From an operational perspective, dust particles reduce mirror and panel efficiency in converting solar energy into heat or electricity. To combat dust, solar energy facilities apply various dust suppressants to surfaces with exposed soil (e.g., graded areas, areas with vegetation removed, roads). There are eight categories of common dust suppressants used for industrial applications: water, salts and brines, organic nonpetroleum products, synthetic polymers, organic petroleum, electrochemical substances, clay additives, and mulch and fiber mixtures (reviewed in Piechota et al. 2004). In a study conducted in the Mojave Desert in which the hydrological impacts of dust suppressants were compared, Singh and colleagues (2003) reported that changes did occur in the volume, rate, and timing of runoff when dust suppressants were used. In particular, petroleum-based and acrylic-polymer dust suppressants drastically influenced the hydrology of disturbed areas by increasing runoff volume and changing its timing. When it is applied to disturbed desert soils, magnesium chloride ($MgCl_2$), a commonly used salt-based dust depressant, does not increase runoff volume but does, however, increase the total suspended solids loads in runoff (Singh et al. 2003).

Others have highlighted the fact that there is a dearth of scientific research and literature on the effects of dust suppressants on wildlife, including the most commonly used category of dust depressant: brines and salts (Piechota et al. 2004, Goodrich et al. 2008). However, the application of $MgCl_2$ to roads was correlated with a higher frequency of plant damage (Goodrich et al. 2008). Because chloride salts, including $MgCl_2$, are not confined to the point of application but have the ability to be transported in runoff (White and Broadly 2001), the potential exists for a loss of primary production associated with plant damage in the habitats surrounding a solar facility, which could directly affect wildlife habitat.

Mortality of wildlife. We are not aware of any published studies documenting the direct effects of USSED on the survival of wildlife. However, subterranean animals can be affected by USSED, including species that hibernate underground. In the Sonoran Desert portion of California, Cowles (1941) observed that most reptiles in the Coachella Valley hibernated at depths of less than 33 centimeters (cm), with many at considerably shallower depths. Included in his observations were flat-tailed horned lizards (*Phrynosoma mcallii*)—a species of special concern in the region because of solar energy development (USDOI and USDOE 2011a)—and the federally protected Coachella Valley fringe-toed lizard (*Uma inornata*). Even lightweight vehicles like motorcycles are capable of causing greatly increased soil density (soil compaction) at a depth of 30–60 cm as their tires pass over the surface (Webb 1983). These observations suggest that vehicular activities in the desert have the potential to kill or entrap large numbers of subterranean animals (Stebbins 1995) through compressive forces or burrow collapse. Similar or greater impacts would be expected from the heavy equipment associated with the construction activities at an energy facility.

Destruction and modification of wildlife habitat. Despite the absence of published, peer-reviewed information on the effects of USSED on wildlife and their habitats, a considerable body of literature exists on the effects of other ground-disturbing activities on both ecological patterns and processes that are broadly comparable. Ground-disturbing activities affect a variety of processes in the desert, including soil density, water infiltration rate, vulnerability to erosion, secondary plant succession, invasion by exotic plant species, and stability of cryptobiotic soil crusts (for reviews, see Lovich and Bainbridge 1999, Webb et al. 2009). All of these processes have the ability—individually and together—to alter habitat quality, often to the detriment of wildlife. Any disturbance and alteration to the desert landscape, including the construction and decommissioning of utility-scale solar energy facilities, has the potential to increase soil erosion. Erosion can physically and physiologically affect plant species and can thus adversely influence primary production (Sharifi et al. 1997, Field et al. 2010) and food availability for wildlife.

Solar energy facilities require substantial site preparation (including the removal of vegetation) that alters topography and, thus, drainage patterns to divert the surface flow associated with rainfall away from facility infrastructure (Abbasi and Abbasi 2000). Channeling runoff away from plant communities can have dramatic negative effects on water availability and habitat quality in the desert, as was shown by Schlesinger and colleagues (1989). Areas deprived

of runoff from sheet flow support less biomass of perennial and annual plants relative to adjacent areas with uninterrupted water-flow patterns.

The impacts of roads. Roads are required in order to provide access to solar energy infrastructure. Both paved and unpaved roads have well-documented negative effects on wildlife (Forman and Alexander 1998), and similar effects are expected in utility-scale solar energy facilities. Although road mortality is most easily detected on the actual roadway, the effects of roads extend far beyond their physical surface. In a study of the effects of roads on Agassiz's desert tortoise populations in southern Nevada, von Seckendorff Hoff and Marlow (2002) examined transects along roads with traffic volumes varying from 25 to 5000 vehicles per day. Tortoises and tortoise sign (e.g., burrows, shells, scat) decreased with their proximity to a road. On roads with high traffic volumes, tortoises and tortoise sign were reduced as far as 4000 meters from the roadside. Roads with lower traffic volumes had fewer far-reaching effects.

Another effect of roads in the desert is the edge enhancement of plants and arthropod herbivores (Lightfoot and Whitford 1991). Perennial plants along the roadside are often larger than those farther away, and annual plant germination is often greatest along the shoulders of roads. It is possible that increased runoff due to impervious pavement or compacted soil contributes to this heterogeneity of vegetation in relationship to a road. Agassiz's desert tortoises may select locations for burrow construction that are close to roads, perhaps because of this increased productivity of food plants (Lovich and Daniels 2000). Although this situation suggests potentially beneficial impacts for herbivorous species of wildlife, such as tortoises, it increases their chance of being killed by vehicle strikes, as was shown by von Seckendorff Hoff and Marlow (2002).

Off-site impacts. Direct impacts on wildlife and habitat can occur well outside the actual footprint of the energy facility. Extraction of large amounts of raw materials for the construction of solar energy facilities (e.g., aggregate, cement, steel, glass); transportation and processing of those materials; the need for large amounts of water for cooling some installations; and the potential for the production of toxic wastes, including coolants, antifreeze, rust inhibitors, and heavy metals, can affect wildlife adjacent to or far from the location of the facility (Abbasi and Abbasi 2000). Abbasi and Abbasi (2000) summarized data suggesting that the material requirements for large-scale solar facilities exceed those for conventional fossil-fuel plants on a cost-per-unit-of-energy basis. In addition, water used for steam production at one solar energy facility in the Mojave Desert of California contained selenium, and the wastewater was pumped into evaporation ponds that attracted birds that fed on invertebrates. Although selenium toxicity was not considered a threat on the basis of the results of one study, the possibility exists for harmful bioaccumulation of this toxic micronutrient (Herbst 2006). In recognition of the hazard, Pimentel and colleagues (1994) suggested that fencing should be used to keep wildlife away from these toxic ponds.

The impacts of USSED on wildlife: Effects due to operation and maintenance

This category includes the effects related to the presence and operation of the solar facility, not the physical construction and decommissioning of the same. Some of the effects (e.g., mortality of wildlife and impacts caused by roads) are similar to those discussed previously for construction and decommissioning and are not discussed further.

Habitat fragmentation. Until relatively recently, the desert Southwest was characterized by large blocks of continuous and interconnected habitat. Roads and urban development continue to contribute to habitat fragmentation in this landscape. Large-scale energy development has the potential to add to and exacerbate the situation, presenting potential barriers to movement and genetic exchange in wildlife populations, including those of bighorn sheep (*Ovis canadensis*), deer (*Odocoileus* spp.), tortoises, and other species of concern and social significance. Research conducted on the effects of oil and gas exploration and development (OGED) on wildlife in the Intermountain West provides a possible analog to USSEDO, since comparable data are not available for the desert Southwest. The potential effects on mule deer (*Odocoileus hemionus*) and other wildlife species include impediments to free movement, the creation of migration bottlenecks, and a reduction in effective winter range size. Mule deer responded immediately to OGED by moving away from disturbances, with no sign of acclimation during the three years of study by Sawyer and colleagues (2009). Some deer avoidance resulted in their use of less-preferred and presumably less-suitable habitats.

Despite a lack of data on the direct contributions of USSEDO to habitat fragmentation, USSEDO has the potential to be an impediment to gene flow for some species. Although the extent of this impact is, as yet, largely unquantified in the desert, compelling evidence for the effects of human-caused habitat fragmentation on diverse wildlife species has already been demonstrated in the adjacent coastal region of southern California (Delaney et al. 2010).

Noise effects. Industrial noise can have impacts on wildlife, including changes to their habitat use and activity patterns, increases in stress, weakened immune systems, reduced reproductive success, altered foraging behavior, increased predation risk, degraded communication with conspecifics, and damaged hearing (Barber et al. 2009, Pater et al. 2009). Changes in sound level of only a few decibels can elicit substantial animal responses. Most noise associated with USSEDO is likely to be generated during the construction phase (Suter 2002), but noise can also be produced during operation and maintenance activities. Brattstrom and Bondello (1983) documented the effects of noise on Mojave

Desert wildlife on the basis of experiments involving off-highway vehicles. Noise from some of these vehicles can reach 110 decibels—near the threshold of human pain and certainly within the range expected for various construction, operation, and maintenance activities (Suter 2002) associated with USSEDO. This level of noise caused hearing loss in animals, such as kangaroo rats (*Dipodomys* spp.), desert iguanas (*Dipsosaurus dorsalis*), and fringe-toed lizards (*Uma* spp.). In addition, it interfered with the ability of kangaroo rats to detect predators, such as rattlesnakes (*Crotalus* spp.), and caused an unnatural emergence of aestivating spadefoot toads (*Scaphiopus* spp.), which would most likely result in their deaths. Because of impacts on wildlife, Brattstrom and Bondello (1983) recommended that "all undisturbed desert habitats, critical habitats, and all ranges of threatened, endangered, or otherwise protected desert species" (p. 204) should be protected from loud noise.

Although many consider solar energy production a "quiet" endeavor, noise is associated with their operation. For example, facilities at which wet-cooling systems are used will have noises generated by fans and pumps. As for facilities with dry-cooling systems, only noise from fans will be produced during operation (EPRI 2002). Because of the larger size requirements of dry-cooling systems, there will be more noise production associated with an increase in the number of fans.

Electromagnetic field generation. When electricity is passed through cables, it generates electric and magnetic fields. USSEDO requires a large distribution system of buried and overhead cables to transmit energy from the point of production to the end user. Electromagnetic fields (EMFs) produced as energy flows through system cables are a concern from the standpoint of both human and wildlife health, yet little information is available to assess the potential impact of the EMFs associated with USSEDO on wildlife. Concerns about EMFs have persisted for a long time, in part because of controversy over whether they're the actual cause of problems and disagreement about the underlying mechanisms for possible effects. For example, there is presently a lack of widely accepted agreement about the biological mechanisms that can explain the consistent associations between extremely low-frequency EMF exposure from overhead power lines and childhood leukemia, although there is no shortage of theories (Gee 2009).

Some conclude that the effects of EMFs on wildlife will be minor because of reviews of the often conflicting and inconclusive literature on the topic (Petersen and Malm 2006). Others suggest that EMFs are a possible source of harm for diverse species of wildlife and contribute to the decline of some mammal populations. Balmori (2010) listed possible impacts of chronic exposure to athermal electromagnetic radiation, which included damage to the nervous system, disruption of circadian rhythm, changes in heart function, impairment of immunity and fertility, and genetic and developmental problems. He concluded that enough evidence exists to confirm harm to wildlife but suggested that further study is urgently needed. Other authors suggest that the generally inconsistent epidemiological evidence in support of the effects of EMFs should not be cause for inaction. Instead, they argue that the precautionary principle should be applied in order to prevent a recurrence of the "late lessons from early warnings" scenario that has been repeated throughout history (Gee 2009).

Magnetic information is used for orientation by diverse species, from insects (Sharma and Kumar 2010) to reptiles (Perry A et al. 1985). Despite recognition of this phenomenon, the direct effects of USSEDO-produced EMFs on wildlife orientation remains unknown.

Microclimate effects. The alteration of a landscape through the removal of vegetation and the construction of structures by humans not only has the potential of increasing animal mortality but also changes the characteristics of the environment in a way that affects wildlife. The potential for microclimate effects unique to solar facilities was discussed by Pimentel and colleagues (1994) and by Harte and Jassby (1978). It has been estimated that a concentrating solar facility can increase the albedo of a desert environment by 30%–56%, which could influence local temperature and precipitation patterns through changes in wind speed and evapotranspiration. Depending on their design, large concentrating solar facilities may also have the ability to produce significant amounts of unused heat that could be carried downwind into adjacent wildlife habitat with the potential to create localized drought conditions. The heat produced by central-tower solar facilities can burn or incinerate birds and flying insects as they pass through the concentrated beams of reflected light (McCrary et al. 1986, Pimentel et al. 1994, Tsoutsos et al. 2005, Wilshire et al. 2008).

A dry-cooled solar facility—in particular, one with a concentrating-trough system—could reject heated air from the cooling process with temperatures 25–35 degrees Fahrenheit higher than the ambient temperature (EPRI 2002). This could affect the microclimate on site or those in adjacent habitats. To our knowledge, no research is available to assess the effects of USSEDO on temperature or that of any other climatic variable on wildlife. However, organisms whose sex is determined by incubation temperatures, such as both species of desert tortoises, may be especially sensitive to temperature changes, because small temperature changes have the potential to alter hatchling sex ratios (Hulin et al. 2009).

Pollutants from spills. USSEDO, especially at wet-cooled solar facilities, has a potential risk for hazardous chemical spills on site, associated with the toxicants used in cooling systems, antifreeze agents, rust inhibitors, herbicides, and heavy metals (Abbasi and Abbasi 2000, Tsoutsos et al. 2005). Wet-cooling solar systems must use treatment chemicals (e.g., chlorine, bromine, selenium) and acids and bases (e.g., sulfuric acid, sodium hydroxide, hydrated lime) for the prevention of fouling and scaling and for pH control of the water used in their recirculating systems (EPRI 2002).

Solar facilities at which a recirculating system is used also have treatment and disposal issues associated with water discharge, known as *blowdown*, which is water with a high concentration of dissolved and suspended materials created by the numerous evaporation cycles in the closed system (EPRI 2002). These discharges may contain chemicals used to prevent fouling and scaling. The potentially tainted water is usually stored in evaporative ponds, which further concentrates the toxicants (Herbst 2006). Because water is an attraction for desert wildlife, numerous species could be adversely affected. The adverse effects of the aforementioned substances and similar ones on wildlife are well documented in the literature, and a full review is outside the scope of this article. However, with the decreased likelihood of wet-cooling systems for solar facilities in the desert, the risk of hazardous spills and discharges on site will be less in the future, because dry-cooling systems eliminate most of the associated water-treatment processes (EPRI 2002). However, there are still risks of spills associated with a dry-cooling system. More research is needed on the adverse effects of chemical spills and tainted-water discharges specifically related to USSEDO on wildlife.

Water consumption (wet-cooled solar). The southwestern United States is a water-poor region, and water use is highly regulated throughout the area. Because of this water limitation, the type of cooling systems installed at solar facilities is limited as well. For example, a once-through cooling system—a form of wet cooling—is generally not feasible in arid environments, because there are few permanent bodies of water (i.e., rivers, oceans, and lakes) from which to draw cool water and then into which to release hot water. Likewise, other wet-cooling options, such as recirculating systems and hybrid systems, are becoming less popular because of water shortage issues in the arid region. Therefore, the popularity of the less-efficient and less-economical dry-cooling systems is increasing on public lands. Water will also be needed at solar facilities to periodically wash dust from the mirrors or panels. Although there are numerous reports in which the costs and benefits were compared both environmentally and economically (EPRI 2002, Khalil et al. 2006) between wet- and dry-cooled solar facilities, to our knowledge no one has actually quantified the effects of water use and consumption on desert wildlife in relation to the operation of these facilities.

Fire risks. Any system that produces electricity and heat has a potential risk of fire, and renewable energy facilities are no exception. Concentrating solar energy facilities harness the sun's energy to heat oils, gases, or liquid sodium, depending on the system design (e.g., heliostat power, trough, dish). With temperatures reaching more than 300 degrees Celsius in most concentrated solar systems, spills and leaks from the coolant system increase the risk of fires (Tsoutsos et al. 2005). Even though all vegetation is usually removed from the site during construction, which reduces the risk of a fire propagating on and off site, the increase of human activity in a desert region increases the potential for fire, especially along major highways and in the densely populated western Mojave Desert (Brooks and Matchett 2006).

The Southwest deserts are not fire-adapted ecosystems: fire was historically uncommon in these regions (Brooks and Esque 2002). However, with the establishment of numerous flammable invasive annual plants in the desert Southwest (Brown and Minnich 1986), coupled with an increase in anthropogenic ignitions, fire has become more common in the deserts, which adversely affects wildlife (Esque et al. 2003). For Agassiz's desert tortoise, fire can translate into direct mortality at renewable energy facilities (Lovich and Daniels 2000) and can cause reductions in food and habitat quality. To our knowledge, however, there is no scientific literature related to the effects of USSEDO-caused fire on wildlife.

Light pollution. Two types of light pollution could be produced by solar energy facilities: ecological light pollution (ELP; Longcore and Rich 2004) and polarized light pollution (PLP; Horváth et al. 2009). The latter, PLP, could be produced at high levels at facilities using photovoltaic solar panels, because dark surfaces polarize light. ELP can also be produced at solar facilities in the form of reflected light. The reflected light from USSEDO has been suggested as a possible hazard to eyesight (Abbasi and Abbasi 2000). ELP could adversely affect the physiology, behavior, and population ecology of wildlife, which could include the alteration of predation, competition, and reproduction (for reviews, see Longcore and Rich 2004, Perry G et al. 2008). For example, the foraging behavior of some species can be adversely affected by light pollution (for a review, see Longcore and Rich 2004). The literature is limited regarding the impact of artificial lighting on amphibians and reptiles (Perry G et al. 2008), and, to our knowledge, there are no published studies in which the impacts on wildlife of light pollution produced by USSEDO have been assessed. However, light pollution is considered by G. Perry and colleagues (2008) to be a serious threat to reptiles, amphibians, and entire ecological communities that requires consideration during project planning. G. Perry and colleagues (2008) further recommended the removal of unnecessary lighting so that the lighting conditions of nearby habitats would be as close as possible to their natural state.

Numerous anthropogenic products—usually those that are dark in color (e.g., oil spills, glass panes, automobiles, plastics, paints, asphalt roads)—can unnaturally polarize light, which can have adverse effects on wildlife (for a review, see Horváth et al. 2009). For example, numerous animal species use polarized light for orientation and navigation purposes (Horváth and Varjú 2004). Therefore, the potential exists for PLP to disrupt the orientation and migration abilities of desert wildlife, including those of sensitive species. In the review by Horváth and colleagues (2009), which was focused mostly on insects but included a few avian references, they highlighted the fact that anthropogenic products that produce PLP can appear to be water bodies to wildlife and can become ecological traps for insects and, to a lesser degree, avian species. Therefore,

utility-scale solar energy facilities at which photovoltaic technology is used in the desert Southwest could create a direct effect on insects (i.e., ecological trap), which could have profound but unquantified effects on the ecological community surrounding the solar facility. In addition, there may be indirect effects on wildlife through the limitation of plant food resources, especially if pollinators are negatively affected. As was stated by Horváth and colleagues (2009), the population- and community-level effects of PLP can only be speculated on because of the paucity of data.

Unanswered questions and research needs

In our review of the peer-reviewed scientific literature, we found only one peer-reviewed publication on the specific effects of utility-scale solar energy facility operation on wildlife (McCrary et al. 1986) and none on utility-scale solar energy facility construction or decommissioning. Although it is possible that we missed other peer-reviewed publications, our preliminary assessment demonstrates that very little critically reviewed information is available on this topic. The dearth of published, peer-reviewed scientific information provides an opportunity to identify the fundamental research questions for which resource managers need answers. Without those answers, resource managers will be unable to effectively minimize the negative effects of USSEDO on wildlife, especially before permitting widespread development of this technology on relatively undisturbed public land.

Before-and-after studies. Carefully controlled studies are required in order to tease out the direct and indirect effects of USSEDO on wildlife. Pre- and postconstruction evaluations are necessary to identify the effects of renewable energy facilities and to compare results across studies (Kunz et al. 2007). In their review of wind energy development and wildlife, with an emphasis on birds, Kuvlesky and colleagues (2007) noted that experimental designs and data-collection standards were typically inconsistent among studies. This fact alone contributes measurably to the reported variability among studies or renders comparisons difficult, if not impossible. Additional studies should emphasize the need for carefully controlled before-after-control-impact (BACI) studies (Kuvlesky et al. 2007) with replication (if possible) and a detailed description of site conditions. The potential payoff for supporting BACI studies now could be significant: They could provide answers for how to mitigate the negative impacts on wildlife in a cost-effective and timely manner.

What are the cumulative effects of large numbers of dispersed or concentrated energy facilities? Large portions of the desert Southwest have the potential for solar energy development. Although certain areas are targeted for large facilities because of resource availability and engineering requirements (e.g., their proximity to existing transmission corridors), other areas may receive smaller, more widely scattered facilities. A major unanswered question is what the cumulative impacts of these facilities on wildlife are. Would it be better for wildlife if development is concentrated or if it is scattered in smaller, dispersed facilities? Modeling based on existing data would be highly suspect because of the deficiency of detailed site-level published information identified in our analysis. Except for those on habitat destruction and alteration related to other human endeavors, there are no published articles on the population genetic consequences of habitat fragmentation related to USSED, which makes this a high priority for future research.

What density or design of development maximizes energy benefits while minimizing negative effects on wildlife? We are not aware of any published peer-reviewed studies in which the impacts on wildlife of different USSED densities or designs have been assessed. For example, would it benefit wildlife to leave strips of undisturbed habitat between rows of concentrating solar arrays? Research projects in which various densities, arrays, or designs of energy-development infrastructure are considered would be extremely valuable. BACI studies would be very useful for addressing this deficiency.

What are the best sites for energy farms with respect to the needs of wildlife? The large areas of public land available for renewable energy development in the desert Southwest encompass a wide variety of habitats. Although this provides a large number of choices for USSED, not all areas have the same energy potential because of resource availability and the limitations associated with engineering requirements, as was noted above. Detailed information on wildlife distribution and habitat requirements are crucially needed for proper site location and for the design of renewable energy developments (Tsoutsos et al. 2005). Public-resource-management agencies have access to rich geospatial data sets based on many years of inventories and resource-management planning. These data could be used to identify areas of high value for both energy development and wildlife. Areas with overlapping high values could be carefully studied through risk assessment when it appears that conflicts are likely. Previously degraded wildlife habitats, such as old mine sites, overgrazed pastures, and abandoned crop fields, may be good places to concentrate USSED to minimize its impacts on wildlife (CBI 2010).

Can the impacts of solar energy development on wildlife be mitigated? The construction of solar energy facilities can cause direct mortality of wildlife. In addition, building these facilities results in the destruction and fragmentation of wildlife habitat and may increase the possibility of fire, as was discussed above. Beyond these effects, essentially nothing is known about the operational effects of solar energy facilities on wildlife. Current mitigation strategies for desert tortoises and other protected species include few alternatives other than translocation of the animals from the footprint of the development into other areas. Although this strategy may be appealing at first glance, animal translocation has a checkered history of success, especially for reptiles and amphibians (Germano and Bishop 2008, CBI 2010). Translocation

has yet to be demonstrated as a viable long-term solution that would mitigate the destruction of Agassiz's desert tortoise habitat (Ernst and Lovich 2009, CBI 2010).

Conclusions

All energy production has associated social and environmental costs (Budnitz and Holdren 1976, Bezdek 1993). In their review of the adverse environmental effects of renewable energy development, Abbasi and Abbasi (2000) stated that "renewable energy sources are not the panacea they are popularly perceived to be; indeed, in some cases, their adverse environmental impacts can be as strongly negative as the impacts of conventional energy sources" (p. 121). Therefore, responsible, efficient energy production requires both the minimization of environmental costs and the maximization of benefits to society—factors that are not mutually exclusive. Stevens and colleagues (1991) and Martín-López and colleagues (2008) suggested that the analyses of costs and benefits should include both wildlife use and existence values. On the basis of our review of the existing peer-reviewed scientific literature, it appears that insufficient evidence is available to determine whether solar energy development, as it is envisioned for the desert Southwest, is compatible with wildlife conservation. This is especially true for threatened species such as Agassiz's desert tortoise. The many other unanswered questions that remain after reviewing the available evidence provide opportunities for future research, as was outlined above.

The shift toward renewable energy is widely perceived by the public as a "green movement" intended to reduce greenhouse-gas emissions and acid rain and to curb global climate change (Abbasi and Abbasi 2000). However, as was noted by Harte and Jassby (1978), just because an energy technology is simple, thermodynamically optimal, renewable, or inexpensive does not mean that it will be benign from an ecological perspective. The issue of wildlife impacts is much more complex than is widely appreciated, especially when the various scales of impact (e.g., local, regional, global) are considered. Our analysis shows that, on a local scale, so little is known about the effects USSEDO on wildlife that extrapolation to larger scales with any degree of confidence is currently limited by an inadequate amount of scientific data. Therefore, without additional research to fill the significant information void, accurate assessment of the potential impacts of solar energy development on wildlife is largely theoretical but needs to be empirical and well-founded on supporting science.

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Thank you for your comment, Michael Connor.

The comment tracking number that has been assigned to your comment is SEDDsupp20101.

Comment Date: January 26, 2012 23:57:05PM
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Comment Submitted:

Western Watersheds Project is submitting this research paper with its comment letter. Thank you.

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RESEARCH ARTICLE

Making molehills out of mountains: landscape genetics of the Mojave desert tortoise

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Abstract Heterogeneity in habitat often influences how organisms traverse the landscape matrix that connects populations. Understanding landscape connectivity is important to determine the ecological processes that influence those movements, which lead to evolutionary change due to gene flow. Here, we used landscape genetics and statistical models to evaluate hypotheses that could explain isolation among locations of the threatened Mojave desert tortoise (*Gopherus agassizii*). Within a causal modeling framework, we investigated three factors that can influence landscape connectivity: geographic distance, barriers to dispersal, and landscape friction. A statistical model of habitat suitability for the Mojave desert tortoise, based on topography, vegetation, and climate variables, was used as a proxy for landscape friction and barriers to dispersal. We quantified landscape friction with least-cost distances and with resistance distances among sampling locations. A set of diagnostic partial Mantel tests statistically separated the hypotheses of potential causes of genetic isolation. The best-supported model varied depending upon how landscape friction was quantified. Patterns of genetic structure were related to a combination of geographic distance and barriers as defined by least-cost distances, suggesting that mountain ranges and extremely low-elevation valleys influence connectivity at the regional scale beyond the tortoises' ability to disperse. However, geographic distance was the only influence detected using resistance distances, which we attributed to fundamental differences between the two ways of quantifying friction. Landscape friction, as we measured it, did not influence the observed patterns of genetic distances using either quantification. Barriers and distance may be more valuable predictors of observed population structure for species like the desert tortoise, which has high dispersal capability and a long generation time.

Keywords Landscape genetics · Desert tortoise · *Gopherus agassizii* · Mojave desert · Least-cost-path · Isolation-by-resistance · Habitat suitability model

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Introduction

Habitat fragmentation can increase isolation among populations, and isolation can increase extinction risk for many species (Crooks and Sanjayan 2006; Fischer

and Lindenmayer 2007) due to demographic stochasticity, increased numbers of deterministic threats, and loss of genetic variation (Lande 1988; Saunders et al. 2001; Fahrig 2003; Henle et al. 2004; Reed 2004; Fischer and Lindenmayer 2007). Although landscape connectivity alone is usually not sufficient to ensure population persistence (Taylor et al. 2006), it does provide several clearly important means of reducing some extinction risks (Crooks and Sanjayan 2006). Among other benefits, connectivity in the landscape allows dispersal from the natal range, aids in rescue effects to prevent local extinctions, facilitates gene flow that prevents inbreeding, and fosters adequate responses to environmental change through the potential for long-term adaptation, the ability to adjust the natural distribution, and potential for recolonization after disturbance (Crooks and Sanjayan 2006).

The degree to which a landscape facilitates or impedes an organism's movement within a population depends both upon structural and functional components (Taylor et al. 1993; Brooks 2003; Taylor et al. 2006). The structural components include landscape heterogeneity that influences the habitat available to the organism, and the functional component describes the organism's response to the available habitat (Brooks 2003; Taylor et al. 2006). Quantifying both components helps us to understand how organisms move through the landscape and to identify where important habitat connections exist within the landscape. Dispersal (or some measure of movement) is one common metric to evaluate the factors that facilitate connectivity and the consequences of the amount of connectivity (Wiens 2001; Uezu et al. 2005). Inferences from genetic data have been recognized as a viable alternative to direct measurements of dispersal (Koenig et al. 1996; Waples 1998; Bohonak 1999; Brooks 2003), and a means to quantify functional connectivity (Brooks 2003; Stevens et al. 2006; Holderegger and Wagner 2008). However, gene flow only represents a subset of dispersal movements because it requires effective reproduction (Brooks 2003; Cushman et al. 2006).

Spatially explicit models and genetic data analyzed using a landscape genetics approach can be used to test specific hypotheses regarding natural levels of habitat connectivity, the influence of particular landscape features on individual movement, and the effects of habitat fragmentation (Manel et al. 2003; Keyghobadi 2007; Storfer et al. 2007). The questions addressed are species-specific, and they are constrained to the temporal and spatial scale at which individuals of a species experience their surroundings (Wiens 2001; Brooks 2003; Holderegger and Wagner 2008). Natural populations often depart from strict isolation-by-distance (Wright 1943), which occurs when the only barrier to gene flow is geographic distance and results in an average increase in genetic differentiation as geographic distance increases (Wright 1943; Slatkin 1993; Epperson 2003). Departures from isolation-by-distance suggest that additional features govern the movement of individuals, and hence the spatial genetic structure (e.g., Coulon et al. 2004; Broquet et al. 2006; Cushman et al. 2006; Epps et al. 2007). Modifying a model of straight-line distance among habitat patches to include features representing the heterogeneity of the landscape that an organism experiences could improve our understanding of landscape connectivity (Adriaensen et al. 2003; Theobald 2006).

Here, we evaluated multiple hypotheses of isolation and quantified landscape connectivity for the Mojave population of the desert tortoise (*Gopherus agassizii*). The Mojave desert tortoise is listed as threatened under the U.S. Endangered Species Act of 1973 (USFWS 1994), and tortoise habitat in this region has become fragmented by transportation corridors, utility infrastructure, and urban development over the past century (Tracy et al. 2004). Although few data exist on dispersal of desert tortoises (Morafka 1994), a recent assessment of spatial genetic structure in this long-lived species suggests that historic movement among adjacent populations has been extensive (Hagerty and Tracy 2010). Genetic differentiation among populations is small, although spatial structure is present (Hagerty and Tracy 2010). Geographic distance explains approximately 68% of the variation in genetic distance (Murphy et al. 2007; Hagerty and Tracy 2010). Nevertheless, there are natural features of the landscape occupied by desert tortoises that likely facilitate or impede movement of individuals in the landscape, and identifying these key components is important for recovery of this threatened species.

We tested hypotheses about putative causes of isolation in a causal modeling framework (Legendre 1993; Cushman et al. 2006) to assess which potential drivers of genetic structure best correlate with patterns of gene flow. Our a priori models were

chosen to test specific hypotheses regarding factors that seem to be the most relevant in determining connectivity among tortoise habitat. We assessed three possible causes of isolation: (1) geographic distance, (2) dispersal barriers, and (3) landscape friction or a measure of the habitat's resistance to flow of individuals through it. Seven potential models incorporated all combinations of isolation by barriers, isolation by landscape friction, and isolation by geographic distance. The causal modeling framework allowed us to identify a single supported model among this set of competing hypotheses. Additionally, we tested each of these models with two quantifications of landscape friction that require different algorithms and assumptions: least-cost path (Adriaensen et al. 2003; Theobald 2006) and isolation-by-resistance (McRae 2006; McRae and Beier 2007; McRae et al. 2008).

Materials and methods

Study system

The Mojave desert tortoise inhabits portions of the Mojave and Colorado Deserts, spanning four states in the southwestern United States (Utah, Arizona, Nevada, and California; Germano et al. 1994). The Mojave and Colorado deserts (>160,000 km^2) are heterogeneous in climate, geology, and topography (Rowlands et al. 1982); however, habitat is relatively continuous at low-elevations (300–900 m) where the vegetation is dominated by creosote scrub (*Larrea tridentata*; Luckenbach 1982). Mojave desert tortoises most commonly occur in areas with gentle slopes, sufficient shade resources, and friable soils to allow burrow construction (Bury et al. 1994; USFWS 1994; Andersen et al. 2000).

Sampling and genotyping

Between 2004 and 2006, blood was collected from 744 desert tortoises throughout the range where the species is federally listed, which includes areas north and west of the Colorado River (Hagerty and Tracy 2010). Sampling sites included areas sampled during annual population monitoring (USFWS 2006) along randomly placed transects within critical habitat, which are the areas that are actively managed for recovery by the U.S. Fish and Wildlife Service, and systematically-placed transects outside of critical habitat areas (Hagerty and Tracy 2010). Universal Transverse Mercator (UTM) coordinates of individual locations were recorded when DNA samples were collected. Individuals were pooled into 25 sampling locations (N = 12–80), which were identified based upon geographic features such as large valleys or combinations of small, connected valleys (Fig. 1). Each of these locations can be assigned to one of seven genotype groups that were identified previously using Bayesian assignment tests (Hagerty and Tracy 2010). The geographic centroid of each sampling location was calculated by finding the central point in polygons defined for the 25 defined sampling regions in ArcGIS (ver. 9.2, ESRI, Redlands, CA, USA) and used to represent populations for further analyses (Fig. 1). The average area of the polygons was 1000 km^2 with a 50 km diameter. We determined that this size polygon was reasonable for this study because desert tortoises have been observed moving greater than 30 km in a single foray (Edwards et al. 2004).

The 20 microsatellites used in this study were loci originally developed for *G. polyphemus* (GP15, GP30, GP61; Schwartz et al. 2003), the Sonoran population of *G. agassizii* (GOAG3, GOAG4, GOAG7; Edwards et al. 2003), and the Mojave population of *G. agassizii* (14 markers; Hagerty et al. 2008). Specific conditions for amplification and fragment analysis are described in detail elsewhere (Hagerty et al. 2008; Hagerty and Tracy 2010). We amplified the microsatellites and completed fragment analysis in collaboration with the Nevada Genomics Center (http://www.ag.unr.edu/Genomics/). All alleles were scored with GeneMapper 5.0 (Applied Biosystems, Inc., Foster City, CA, USA).

The microsatellite loci did not deviate from Hardy–Weinberg proportions and did not exhibit significant linkage disequilibrium (Hagerty and Tracy 2010). Loci exhibited high gene diversity and allelic richness (Hagerty and Tracy 2010). We calculated pair-wise genetic distance measures for the 25 sampling locations: $F_{ST}/(1 - F_{ST})$ (as recommended by Rousset (1997)) using pair-wise F_{ST} values from FSTAT (Goudet 1996), the genotype likelihood ratio (D_{LR}; Paetkau et al. 1997) in DOH (Paetkau et al. 1997), and Nei's standard genetic distance D_S (Nei

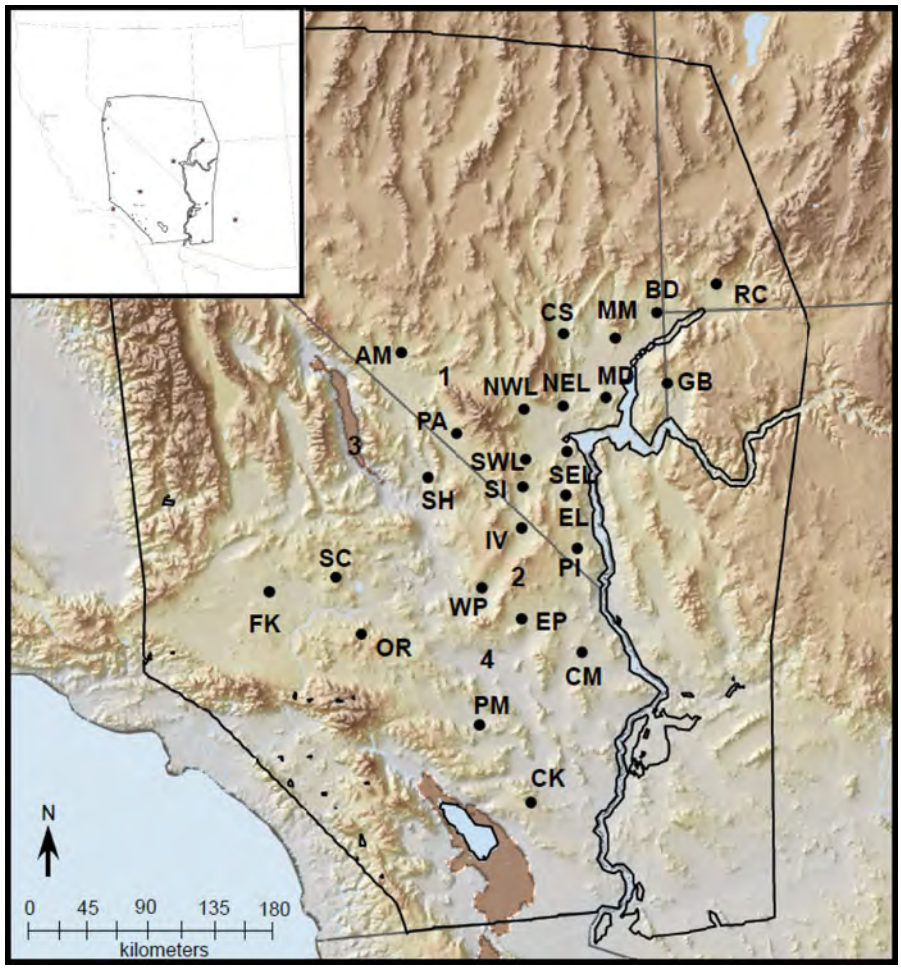

Fig. 1 Map of the sampled locations for landscape genetics of the Mojave desert tortoise. The *thick black line* designates the outline of the coverage of the habitat model. State outlines are designated as *grey lines*. The center for each of the 25 sampling locations are shown as *black dots* and are identified as follows: RC (Red Cliffs Desert Reserve, UT), Beaver Dam Slope (NV, UT), MM (Mormon Mesa, NV), GB (Gold Butte, NV), MD (Muddy Mountains, NV), CS (Coyote Springs, NV), NEL (Northeast Las Vegas, NV), NWL (Northwest Las Vegas, NV), AM (Amargosa Desert, NV), PA (Pahrump, NV), SH (Shadow Valley, CA), IV (Ivanpah, CA), WP (West Providence Mountains, CA), SI (South I-15 corridor—Sloan, Jean, Roach, NV), SWL (Southwest Las Vegas Valley, NV), SEL (Southeast Las Vegas, NV), EL (Eldorado Valley, NV), PI (Piute Valley, NV), CM (Chemehuevi Valley, NV), EP (East Providence Mountains, CA), CK (Chuckwalla Bench, CA), PM (Pinto Mountains, CA), OR (Ord-Rodman Valleys, CA), SC (Superior-Cronese Valleys, CA), FK (Fremont-Kramer Valleys, CA). Major topographic features include: (1) Spring Mountains, (2) New York and Providence Mountains, (3) Death Valley, and (4) Cadiz Valley. The Baker Sink begins near "3" and ends near "4"

1972) in Tools for Population Genetic Analysis (TFPGA; Miller 1997). Results were similar among all genetic distance measures, so we only report analyses using D_{LR} (Supplementary material). We also calculated pair-wise Euclidean distances (m) as a measure of straight-line geographic distance between pairs of the centroids of our sampling locations in ArcGIS (ver. 9.2, ESRI, Redlands, CA, USA).

Statistical model of suitable habitat

We identified levels of landscape friction with a model of the distribution of potential habitat in space (Wang et al. 2008) instead of the approach that uses expert opinion or ad hoc measures using environmental variables (Adriaensen et al. 2003; Verbeylen et al. 2003; Broquet et al. 2006; Theobald 2006; McRae and

Beier 2007). The implicit assumption is that a model of habitat suitability is a valid approximation for landscape permeability to dispersal (Broquet et al. 2006; Epps et al. 2007; Wang et al. 2008). We developed a model of habitat suitability using the presence data (15,311 observations) and environmental layers described in Nussear et al. (2009). We used 12 environmental variables to predict the presence of the Mojave desert tortoise throughout their geographic range. The environmental data consisted of various GIS layers of vegetation, topography, soils and precipitation (Table 1). Tortoise presence points were aggregated into a 1 km^2 grid where one or multiple locations per km^2 indicated presence of tortoises. The total number of number of presence points was reduced to 6,350 grid cells containing tortoises. Environmental layers were calculated at a 1 km^2 scale either directly (e.g., precipitation) or using an area-weighted average for each 1 km^2 cell (e.g., elevation). The number of environmental layers was reduced from an initial set of 16 GIS layers (Nussear et al. 2009) using AIC ranking (Burnham and Anderson 2002) in a bi-directional, stepwise model-ranking process (Lehmann et al. 2002). A Generalized Regression Analysis and Spatial Prediction (GRASP) modeling algorithm (Lehmann et al. 2002) was used to build the model using 80% of the points (5,080), and the remaining 20% of the points (1,270) were used for model evaluation. Model performance was evaluated using receiver-operating characteristics (ROC) that were calculated using the ROCR package (Sing et al. 2005) in R (R Development Core Team 2009). The 12-variable model had a high AUC (area under the ROC curve) test score (0.92) and had a significant Pearson's correlation coefficient of 0.75 ($P < 0.001$), indicating a substantial agreement between the predicted habitat and the observed presence of desert tortoises in the testing set. The resulting predictive model of Mojave desert tortoise occurrence was represented by a floating-point value ranging from 0 to 1, which we defined as suitability of tortoise habitat in each cell. We used this model of tortoise occurrence to create a cost surface for the isolation by landscape friction model. Thus, cells of lower potential habitat would reduce the ability to traverse the landscape. The cost surface was calculated by subtracting each cell value from 1.

We also created a binary representation of habitat suitability by classifying habitat suitability as a binary distribution where 1 equaled habitat and 0 equaled non-habitat by using a threshold that included 99% of all known presence cells (using a model value >0.125). Cells that were non-habitat were coded as "no data" in the binary cost surface, which caused those cells to be complete barriers to movement. This binary model was used as our isolation by barriers model because it designated places that would not be considered tortoise habitat, but explicitly allowed tortoises to move across all other cells without friction.

Table 1 Variables used to model potential habitat for the Mojave desert tortoise (Nussear et al. 2009)

Category	Variable	Data layer description	Source
Topography	Elevation	30 m DEM	Wallace and Gass (2008)
	Slope	Derived from 30 m DEM	Wallace and Gass (2008)
	Northness (aspect)	Derived from 30 m DEM	Wallace and Gass (2008)
	Average surface roughness	Derived from 30 m DEM	Wallace and Gass (2008)
	Percent smoothness	Derived from 30 m DEM	Wallace and Gass (2008)
Soils	Average bulk density		STATSGO database; Bliss (1998)
	Depth to bedrock		STATSGO database; Bliss (1998)
	Average percentage of rocks	>254 mm B-axis diameter	STATSGO database; Bliss (1998)
Vegetation	Perennial plant cover		Wallace et al. (2008)
	Annual plant proxy		Wallace and Thomas (2008)
Climate	Mean dry season precipitation	30 year normal period (1961–1990) May–October	Blainey et al. (2007)
	Mean wet season precipitation	30 year normal period (1961–1990) November–April	Blainey et al. (2007)

We analyzed the resulting cost surfaces with the centroids of the 25 tortoise sampling locations using least-cost-path and isolation-by-resistance as quantifications of landscape friction. The area covered by the GRASP model included the entire area sampled for population genetics, and the Colorado River was included as an absolute barrier in all models (Fig. 1; Nussear et al. 2009).

Quantifying landscape friction: least-cost path

Least-cost-path analyses are used to estimate a least-cost distance between habitat patches (Adriaensen et al. 2003; Theobald 2006). The least-cost distance is a modified Euclidean distance that uses landscape friction to determine a more ecologically-relevant path between patches (Verbeylen et al. 2003; Theobald 2006). Typically, least-cost distance is calculated using a cost-weighted function (cost associated with moving across a cell). The least-cost path for each pair of locations was quantified with the cumulative cost across all cells while moving from location A to B in GRASS GIS (ver. 6.3; GRASS Development Team 2008). We plotted the least-cost path between each of the 25 sampling locations in ArcGIS (ver. 9.2, ESRI, Redlands, CA, USA).

Quantifying landscape friction: isolation-by-resistance

Isolation-by-resistance is based in circuit theory, and uses a graph theoretic approach to predict movement patterns and quantify the effects of certain landscape features (McRae 2006; McRae et al. 2008). The edges between nodes (or locations) in the graph network are represented as analogs to resistors in an electrical circuit and the same basic concepts apply (i.e., Ohm's Law; McRae et al. 2008). Resistance distance is a measure of isolation that is similar to the least-cost distance; however, the resistance distance decreases as the number of available pathways between locations increases (McRae et al. 2008). In addition to integrating connectivity across all possible paths, the resistance distance assumes that the disperser does a random walk between points, basing each movement on the relative quality of the habitat in all directions. When the movement corresponds to gene flow, which operates on a different spatio-temporal scale, the surrogate is migration rate per generation (McRae 2006).

We calculated resistance distance between all pairs of desert tortoise locations in Circuitscape (ver. 3.4; McRae and Shah 2009). For our models, the habitat suitability in each grid cell was treated as a conductance value (the inverse is resistance). Circuitscape provided a pair-wise resistance distance matrix as well as a cumulative (additive among pairs) current map, representing the expected probability of movement for random walkers, which we viewed in ArcGIS (ver. 9.2, ESRI, Redlands, CA, USA).

Causal modeling framework and Mantel tests

To evaluate geographic distance, barriers, and landscape friction in a causal modeling framework (Legendre 1993; Cushman et al. 2006), we identified the diagnostic expectations for each of the seven possible hypotheses of causal relationships (Table 2). Diagnostic expectations for each model included a specific set of partial correlations to be statistically significant or not (Table 2). For example, under the distance only model, geographic distance would have a significant positive correlation with genetic distance after parsing out the barrier or landscape-friction matrix (Table 2). Under the same model, the barrier and landscape-friction matrices would not be significantly correlated to genetic distance after parsing out geographic distance (Table 2). Then, we compared the statistical relationship between genetic distance and each model (Legendre 1993; Cushman et al. 2006). We determined a single supported model by testing each factor against the competing factors and then evaluating the combined results. The hypothesis with the most support should meet all of the diagnostic expectations associated with that hypothesis, providing a rigorous evaluation of the potential factors that impede gene flow (Table 2).

We completed Mantel tests (Mantel 1967) and partial Mantel tests (Smouse et al. 1986) in Program R using the "vegan package" (Oksanen et al. 2007). A Pearson product-moment correlation was calculated, and we determined significant correlations by using a permutation test with 10,000 replicates. We used the Monte Carlo *P*-value to determine significant simple and partial Mantel correlations, but only used them to determine which diagnostic expectations were met for each model. These actions reduced the chance of bias in our interpretations, and they address some of the criticisms of partial Mantel tests

Table 2 Evaluation of the isolation hypotheses using two quantifications of landscape friction: least-cost path (LCP) and isolation-by-resistance (IBR)

Partial Mantel	Diagnostic expectations and model support													
	Distance only		Barrier only		Landscape only		Distance and barrier		Distance and landscape		Landscape and barrier		Distance, landscape, barrier	
	LCP	IBR*	LCP	IBR	LCP	IBR	LCP*	IBR	LCP	IBR	LCP	IBR	LCP	IBR
DG.B	**>0**	**>0**	NS	NS	NA	NA	**>0**	**>0**	**>0**	**>0**	NS	NS	**>0**	**>0**
DG.L	**>0**	**>0**	NA	NA	NS	NS	**>0**	**>0**	**>0**	**>0**	NS	NS	**>0**	**>0**
BG.D	NS	**NS**	**>0**	>0	NA	NA	**>0**	>0	NS	**NS**	**>0**	>0	**>0**	>0
BG.L	NA	NA	**>0**	**>0**	NS	NS	**>0**	**>0**	NS	NS	**>0**	**>0**	**>0**	**>0**
LG.B	NA	NA	**NS**	**NS**	>0	>0	**NS**	**NS**	>0	>0	>0	>0	>0	>0
LG.D	**NS**	**NS**	NA	NA	>0	>0	**NS**	**NS**	>0	>0	>0	>0	>0	>0

The diagnostic expectations (partial Mantel test and the expected significance value) for each hypothesis are listed. *D* distance, *B* barrier (binary habitat model), *L* landscape (continuous habitat model), *G* genetic distance (D_{LR}), *NS* not significant, >0 = *P*-value below 0.05, *NA* not applicable. A period separates the main matrices on the left from the covariate matrix on the right that is partialed out in the partial Mantel test. For example, DG.B is a partial Mantel test between the distance, and the genetic distance matrices with the barrier matrix partialed out. Model support is indicated with bold type based upon the *P*-value for each partial Mantel test compared to the diagnostic expectations. Refer to Table 3 for the exact *P*-values for each partial Mantel test

* The hypothesis with the most support

(Raufaste and Rousset 2001; Rousset 2002, but see Castellano and Balletto 2002; Balkenhol et al. 2009).

Results

Mantel correlations

Euclidean distance correlated significantly with pairwise genetic distance, as evidenced by a significant Mantel correlation (Table 3). Additionally, least-cost distances and resistance distances for the landscape-friction and barrier models were correlated significantly with genetic distances between pairs of sampling locations (Table 3). However, the simple Mantel correlations were lower for the resistance-distance matrices (Table 3).

Causal modeling and partial Mantel tests

The hypothesis of isolation with the most support varied depending on the quantification of landscape friction (Table 2). Using least-cost distances, the barrier and distance model was fully supported by all the statistical expectations. Using resistance

Table 3 Mantel and partial Mantel correlations (*r*) between spatial and genetic pairwise distances among 25 sampling locations

Mantel or partial Mantel test	Least-cost distance		Resistance distance	
	r	*P*-value	*r*	*P*-value
DG	0.821	**0.0001**		
BG	0.820	**0.0001**	0.467	**0.0001**
LG	0.738	**0.0001**	0.351	**0.0001**
DG.B	0.194	**0.0300**	0.766	**0.0001**
DG.L	0.537	**0.0001**	0.806	**0.0001**
BG.D	0.188	**0.0250**	−0.094	0.7900
BG.L	0.339	**0.0004**	0.580	**0.0001**
LG.B	−0.256	0.9930	−0.507	0.9900
LG.D	−0.077	0.7740	−0.241	0.1940

Spatial distances are resistance distance or least-cost distance using the cost surface from the habitat model. The Mantel test statistic *r* is based on a one-sided Pearson's product-moment correlation and significance values are based on 10,000 permutations. *D* distance, *B* barrier (binary habitat model), *L* landscape (continuous habitat model), *G* genetic distance (D_{LR}). A period separates the main matrices on the left from the covariate matrix on the right that is partialed out in the partial Mantel test. For example, DG.B is a partial Mantel test between the Euclidean distance and the genetic distance matrices with the barrier distance matrix partialed out. Bold values indicate *P*-values < 0.05

distances, the distance model was fully supported (Table 2). The outcome of the BG.D partial Mantel test was the main difference between the two landscape friction quantifications, causing the barrier and distance model to not be fully supported using resistance distances (Tables 2, 3). The landscape-friction component of all hypotheses had no support based on the diagnostic expectations (Tables 2, 3).

The cumulative, least-cost paths across the 25 locations were similar in the landscape-friction and barrier models (Fig. 2). The paths for both models did not include large areas of unsuitable habitat such as the northwest corner of the range and major mountain ranges such as the Spring Mountains (Fig. 2). The barriers were apparent in both models, however, the lack of a gradient across other habitat in the barrier model made individual paths between locations more direct, making them more similar to the Euclidean distance (not shown). Similar barriers and habitat corridors were visible in the isolation-by-resistance maps (Fig. 3) when compared to the least-cost-path maps (Fig. 2). Mountain ranges (e.g., Spring, New York, Providence, and Sheep Ranges) and low elevation areas (Death and Cadiz Valley) had no current flow (Fig. 3). The northeastern portion of the desert tortoise's range in Nevada and into California,

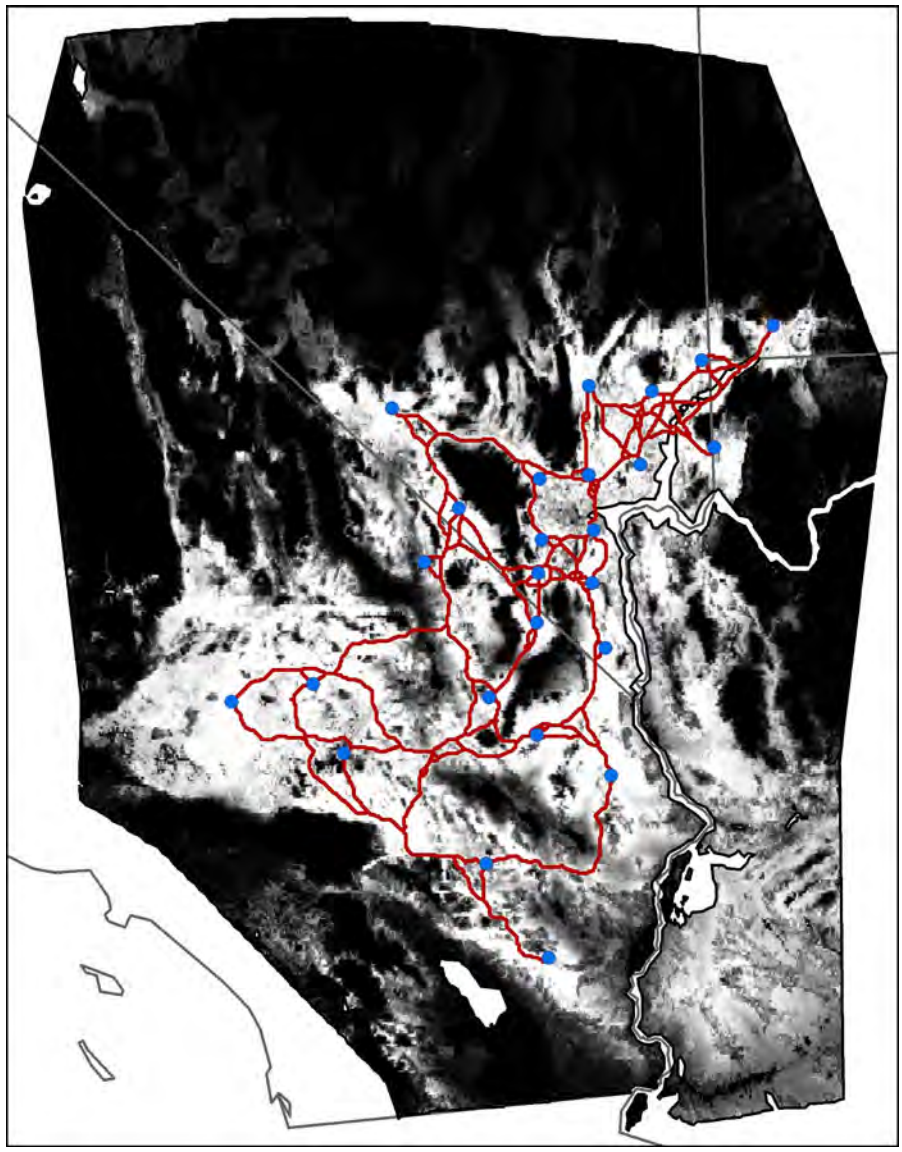

Fig. 2 Distribution of desert tortoise habitat in the Mojave Desert predicted using the 12-variable GRASP model in Program R and the cumulative least-cost path using the 25 pair-wise population comparisons. Gradient of *grey* (floating values) indicate probability of desert tortoise occurrence. *Black* indicates lowest probability (0) while *white* indicates highest probability (1). *Red lines* indicate least-cost paths between pairs of sampling locations. *Blue dots* represent the 25 population centroids

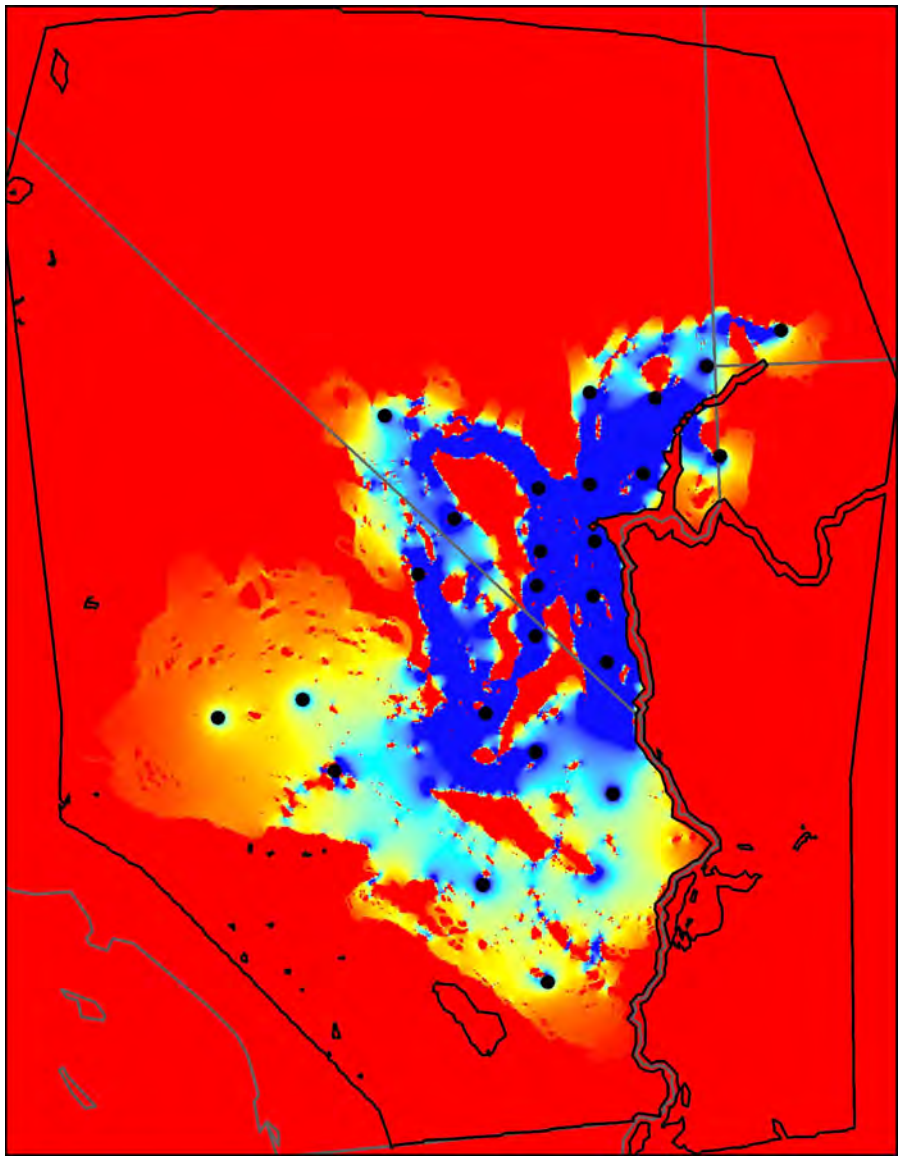

Fig. 3 Cumulative current maps between pairs of populations from the isolation-by-resistance models using the binary 12-variable habitat model (barrier). The gradients of colors indicate the probability of desert tortoise movement, with *red regions* indicating no current, *yellow* and *orange regions* representing low current, and *blue regions* representing high current. *Black dots* represent the 25 population centroids

mainly through Las Vegas valley, along the Colorado River, and regions between mountain ranges, contained areas of very high current density (Fig. 3). In contrast, natural barriers did not fragment habitat within California and had more diffuse current flow between sampling locations (Fig. 3).

Discussion

We evaluated hypotheses about isolation among populations of the Mojave desert tortoise in a causal modeling framework to determine which factors most likely limit gene flow. Hypotheses included combinations of three factors: geographic distance, dispersal barriers, and landscape friction. We identified geographic distance and dispersal barriers as dominant factors associated with genetic structure, while landscape friction, as we defined it, had little to no little influence.

Previously, the desert tortoise was identified as a model organism for studying isolation-by-distance (Edwards et al. 2004). Straight-line distances among locations of desert tortoises strongly correlates with

genetic distances, suggesting that dispersal distance is a major factor shaping genetic structure among, and within, populations (Edwards et al. 2004; Murphy et al. 2007; Hagerty and Tracy 2010). Our data supported these previous assertions, which is an unusual circumstance for natural populations. For a majority of terrestrial species, straight-line distances are correlated only weakly with genetic distance (e.g., Vos et al. 2001; Coulon et al. 2004; Broquet et al. 2006; McRae and Beier 2007). However, genetic distance correlates well with geographic distance at a landscape scale for some terrestrial turtles and tortoises (e.g., Howeth et al. 2008).

Dispersal barriers also were correlated with genetic distance, and the distance and barriers hypothesis was the best-supported model with the least-cost distance quantification. Therefore, dispersal distance may not be the only factor impeding gene flow. Gene flow among desert tortoise populations is at least partially restricted by large topographic features such as high-elevation mountain ranges (e.g., Spring Mountains, New York Mountains, Providence Mountains) and very low elevation regions (e.g., Death Valley, Cadiz Valley; Fig. 1). These apparent elevation barriers are visible in the maps of landscape friction (Figs. 2, 3) and elevation explained a high proportion of the variance in tortoise presence in the habitat model (Nussear et al. 2009). Elevation appears to be an important determinant of these partial barriers, but it is an indirect measure of several variables, including thermal environment, soil type, and vegetation assemblages (e.g., Nagy and Medica 1986; Germano et al. 1994; Zimmerman et al. 1994; Andersen et al. 2000; Nussear 2004). Thus, areas with extremely high or low elevations likely impose thermal constraints that we were unable to model directly, provide suboptimal vegetative cover, and physically impair movements.

Due to one diagnostic expectation, barriers appeared not to affect genetic structure with the resistance-distance quantification. Differences between the quantifications of landscape friction could explain this result. Most importantly, when more than one pathway is available to traverse the landscape or the size of the path increases, the resistance distance effectively decreases, but the least-cost distance does not (McRae et al. 2008). The redundancy in habitat corridors may have reduced resistance (friction) enough that the barriers were no longer correlated with genetic distance between sampling locations of desert tortoises. The underlying assumptions of the algorithm are also different. The least-cost-path algorithm, which is an overall measure of landscape friction, assumes that a disperser has complete knowledge of the landscape as it chooses the "preferred" route (McRae et al. 2008), though the feasibility of the route is not considered (Adriaensen et al. 2003). The isolation-by-resistance algorithm assumes that the disperser is equivalent to a random walker that chooses a direction for each step based only on the relative quality of the habitat in the adjacent directions, allowing the potential for wandering (McRae et al. 2008). However, it is important to recall that we investigated how the landscape influences migration rates per generation across a large geographic area, not individual dispersers among habitat patches. In this case, we can interpret the optimal path (s) as proportionally increasing the amount of gene flow.

The differences between the two quantifications can be compared by regression of the residuals from linear regressions of the friction measures against Euclidean distance. Individual comparisons with higher least-cost distances compared to the Euclidean distance (higher residuals) are locations that are separated by large mountain ranges. For example, the South I-15 corridor (SI) and Pahrump (PA) are separated by approximately 66 km straight-line distance, but are also separated by the Spring Mountains. These locations have a pair-wise F_{ST} of 0.023 (Hagerty and Tracy 2010). In contrast, two locations with an equivalent straight-line distance that are not separated by a mountain range (Amargosa Desert and Pahrump) have a pair-wise F_{ST} value of 0.009 (Hagerty and Tracy 2010). This example illustrates why the barriers and distance hypothesis was supported by the diagnostic expectations with the least-cost distance. However, individual comparisons with higher resistance distances compared to the Euclidean distance (higher residuals) are locations that are separated by "pinch points," or areas with very narrow habitat corridors that increase the resistance distance. For example, high resistance distances are connected to locations such as Red Cliffs Desert Reserve (RC), which has a very narrow area of habitat that connects it to the rest of the range (Fig. 3). These narrow habitat corridors appear to drive the results for isolation-by-resistance. Multiple habitat corridors that circumvent the mountain barriers reduce the resistance, and could explain the reduction in support for the barriers and distance hypothesis.

We did not find any support for the hypothesis that landscape friction per se causes isolation for Mojave desert tortoises and there are several potential reasons for this. First, friction accumulates with distance, so isolation-by-distance may dominate the explained variance, thus masking additional resistance. Second, our landscape variables may be insufficient to capture the factors influencing the movement of tortoises through the landscape, although they are good predictors of tortoise presence. Quantifying landscape friction relies on relevant landscape variables, which accurately reflect the cost of dispersal for the individual at the appropriate temporal and spatial scale (Balkenhol et al. 2009). Therefore, the effectiveness of the approach depends upon success in modeling landscape friction (Holderegger and Wagner 2008). Our chosen landscape variables, which describe desert tortoise habitat in the present, also may not capture the appropriate temporal scale to explain the genetic population structure (Balkenhol et al. 2009). Further, we used statistical habitat models (Austin 2002; Lehmann et al. 2002), where the chosen variables were predictors of tortoise habitat suitability, and used as a proxy for landscape friction. Thus, the cost surfaces from the habitat suitability model may only reflect habitat use and not the cost of dispersal (Epps et al. 2007).

Another potential explanation for the lack of support for landscape resistance is that the processes that influence movement at finer spatial and temporal scales may not impact observed, broad scale patterns of population structure (Lee-Yaw et al. 2009). Although heterogeneity in variables such as annual and perennial vegetation and precipitation likely influence daily, seasonal, and annual movements of tortoises, these variables provided little explanation for the patterns of genetic structure that we observed at the regional level. The effects of landscape variables may be limited at these broader spatial scales, especially for species with strong dispersal capabilities that have multiple avenues for gene flow (Lee-Yaw et al. 2009). At the regional scale, desert tortoise habitat had considerable redundancy in habitat corridors, which may reduce the impact of any high resistance areas at a local scale (Fig. 3). The most influential features in this system are likely absolute barriers to dispersal such as the Colorado River, which separates the Mojave and Sonoran populations of the desert tortoise (Murphy et al. 2007).

Our study reinforces the hypothesis that habitat within the Mojave population of the desert tortoise was well connected. We can deduce from the *F*-statistics and assignment tests that gene flow among adjacent populations within the Mojave and Colorado Deserts was relatively high, at least historically (Hagerty and Tracy 2010). Las Vegas Valley was hypothesized previously to be a transitional corridor between the northern and southern reaches of the geographic range (Britten et al. 1997; Hagerty and Tracy 2010). We detected habitat corridors in Las Vegas Valley, and along the foothills of the New York and Providence Mountains (Fig. 3). In comparison to the northeastern Mojave Desert, habitat in the southwestern portion of the range is more continuous and has few "pinch points" that indicate important, restricted habitat corridors (i.e., low habitat redundancy). The Baker Sink is a low-elevation barrier that begins in Death Valley and separates these topographically different areas (Fig. 1).

Despite inferring the existence of partial barriers, gene flow was most likely possible through local interactions over many generations. Therefore, most, if not all, dispersal barriers were permeable over the long temporal scale at which tortoise population dynamics likely occur. Genetic exchange and dispersal are population-level processes, which occur over long temporal scales from decades to centuries, especially for species with long generation times (Brooks 2003; Keyghobadi 2007). Thus, our models are best used for addressing large-scale patterns of gene flow that were present for generations, not the nuances of dispersal over short time scales (McRae 2006; Epps et al. 2007; Lee-Yaw et al. 2009).

Our modeling cannot address any present day barriers to gene flow for the Mojave desert tortoise. For species with long generations times (such as the desert tortoise), detecting the effects of recent habitat fragmentation may be difficult, even when using variable molecular markers (Keyghobadi 2007, though see Murphy et al. 2008). Indeed, any changes in gene flow that have occurred over the past century, such as the construction of major highways, are likely not yet visible with microsatellite markers because the generation time for a desert tortoise is estimated to be 25 years (USFWS 1994; Hagerty and Tracy 2010). However, evidence exists that roads can cause changes in genetic structure with sufficient time (e.g., Vos et al. 2001; Epps et al. 2005), and in some cases

as few as five generations (Murphy et al. 2008). We can hypothesize that fragmentation of the Mojave Desert has altered the natural patterns of dispersal and gene flow for this species, which we began to uncover in this study. Future work should include tests of the effects of fragmentation and modeling to predict any resulting genetic effects.

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The comment tracking number that has been assigned to your comment is SEDDsupp20102.

Comment Date: January 26, 2012 23:57:14PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20102

First Name: Ann
Middle Initial: M
Last Name: Congdon
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Address: P O Box 1
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City: Twentynine Palms
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Zip: 92277
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

There was insufficient publication and many people have not read the report. I am requesting an extension of the public comment period for the following reasons:
The Solar PEIS Supplement (a 582-page document) with its extensive scientific data and regulatory information requires time for stakeholders to make informed comments.
An extension of the public comment period (3 months) is necessary to have sufficient time to adequately analyze the effects of 20 million additional acres of public lands and to ensure a meaningful democratic process.

The size of these variance lands east of the City of Twentynine Palms and east of the Air/Ground Combat Center will affect wildlife corridors and other environmental, cultural, and economic resources. Solar development on these lands and their proximity to the Joshua Tree National Park which attracts visitors from all over the world will have a significant effect on the local and regional tourism economy of the gate-way communities in the Morongo Basin.

Thank you for your comment, Alan Carlton.

The comment tracking number that has been assigned to your comment is SEDDsupp20103.

Comment Date: January 27, 2012 00:05:27AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20103

First Name: Alan
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Attachment:

Comment Submitted:

Dear Secretary Salazar,

I appreciate the opportunity to submit comments to the Bureau of Land Management ("BLM") on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States ("Supplement to the Draft PEIS"). I am submitting these comments as someone who cares deeply about preserving our precious Western ecosystems and wild lands. However, I also have a strong commitment to halting climate change and ending our dependence on fossil fuels.

I support developing rules to guide solar projects to the most appropriate areas to minimize impacts to wildlife and ecosystems. I strongly support limiting development on public lands to low-impact solar energy zones.
Your proposal to allow additional projects outside zones (the "Variance Process") could undermine the entire solar energy program if developers can site solar projects in areas with high environmental resource value. If the variance process is included in the final program, please make sure that variance applications are the exception not the rule by processing such applications only in areas with low resource conflicts and only when solar energy zones contain insufficient land. Variance applications should be processed in accordance with IM No. 2011-061.

I commend the BLM for excluding fragile and ecologically important areas from solar development in response to environmental concerns (the "Exclusion Areas"). I would like to see this list of Exclusion Areas expanded to include additional environmentally sensitive areas and those areas important to the survival of wildlife species such as: wildlife habitat management areas, golden eagle foraging and nesting habitat, the entire Ivanpah Valley in both Nevada and California, Citizens Wilderness Proposals, lands acquired by the BLM for conservation purposes and the entire Pisgah Valley.

Sincerely,

Thank you for your comment, Marilyn Jasper.

The comment tracking number that has been assigned to your comment is SEDDsupp20104.

Comment Date: January 27, 2012 01:25:18AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20104

First Name: Marilyn
Middle Initial:
Last Name: Jasper
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Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

We care deeply about preserving our ecosystems and wildlife habitat as well as halting climate change/dependency on fossil fuels. Rules to establish solar projects in appropriate areas that minimize impacts and to limit such projects to low-impact solar energy zones must be established and fully followed. Allowing projects outside such zones ("Variance Process") should not be allowed, especially if any high-value environmental resources would be impacted. If/when rarely allowed, Variance applications should be processed in accordance with IM No. 2011-061.
Any/All efforts to exclude fragile and important areas as well as any areas which are important for wildlife survival must given highest priority in locating solar development.

Thank you for your comment, Brian King.

The comment tracking number that has been assigned to your comment is SEDDsupp20105.

Comment Date: January 27, 2012 10:34:05AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20105

First Name: Brian
Middle Initial:
Last Name: King
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City: Salt Lake City
State: UT
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Attachment: Rocky Mountain Power - Comments on Solar Draft PEIS - 27January2012.pdf

Comment Submitted:

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

1407 West North Temple
Salt Lake City, UT 84116

January 27, 2012

Supplemental and Draft Solar Programmatic Environmental Impact Statement (PEIS)

Rocky Mountain Power Comment Letter

To Whom It May Concern,

Rocky Mountain Power (the Company), a division of PacifiCorp, appreciates the U.S. Department of Energy, Energy Efficiency and Renewable Energy Program and the U.S. Department of the Interior, Bureau of Land Management's efforts to facilitate future siting of utility-scale solar /renewable energy development and efforts to ensure consistent application of conservation and mitigation measures applicable to such development. The Company serves over 1 million customers in three states, Idaho, Utah and Wyoming.

The Company maintains and operates transmission lines within the vicinity of SEZs identified in the PEIS in Utah and is currently planning additional lines, notably the Sigurd to Red Butte 345 kV Transmission Line Project (DEIS released in summer of 2011). As such the Company takes vested interest in energy resource development within its service territory.

The Company provides the following comments for consideration as follows:

Criteria to Identify SEZs

Criteria to identify SEZs include proximity to transmission lines, as stated specifically for the Milford Flats South SEZ on page 13.2-1, Section 13.2.1.1 General Information, lines 3-39 and is further evident in the description of the Milford Flats South SEZ which includes the following statement on page 13.2-1, lines 23-24 that "The nearest alternating current transmission line is a 345-kV line that runs north to south about 19 mi (31 km) southeast of the eastern boundary of the proposed SEZ.". The Company recognizes that proximity to transmission is one of several criteria, albeit a fairly important criterion, used to identify SEZs.

The Company concurs with the assumption made on page 13.2-3, Section 13.2.1.2 Development Assumptions for the Impacts Analysis, lines 24-29 stating "It is possible that this existing line could be used to provide access from the SEZ to the transmission grid, but the 345-kV capacity of that line may be inadequate for 576 to 1,037 MW of new capacity (note: a 500-kV line can approximately accommodate the load of one 700-MW facility). At full build-out capacity, it is likely that new transmission and/or

ROCKY MOUNTAIN POWER
A DIVISION OF PACIFICORP

1407 West North Temple
Salt Lake City, UT 84116

upgrades of existing transmission lines would be required to bring electricity from the proposed Milford Flats South SEZ to load centers; however, at this time, the location and size of such new transmission facilities is unknown."

Similar conclusions are made for the Escalante Valley SEZ (3 miles from the termination of an existing 138 kV line).

The Company would like to emphasize that the existence of a transmission line does not necessarily mean that adjacent generation sources can be accommodated by that line. Therefore, this section of the document appears to make a conclusion that may be premature and inaccurate without much further detailed study of the transmission capacity on the existing system in the vicinity of an SEZ.

Safety and Setback from Existing Facilities

The Company requests that safety issues, such as setback distances from existing and currently proposed transmission lines be incorporated and clearly articulated within the PEIS and identification of SEZs. Based on review of maps of the proposed Milford Flats South and Escalante Valley SEZs, it is difficult to determine their location in relation to the Companies currently proposed Sigurd to Red Butte 345 kV transmission line study corridor and any potential siting conflicts that may exist.

Regulatory Mechanisms

The Company encourages the BLM to consider potential Applicants' responsibilities under other federal processes and/or regulatory obligations as part of its assessment for future generation potential; especially those related to transmission system reliability and governed by the Western Electricity Coordinating Council (WECC) and/or the Federal Energy Regulatory Commission (FERC).

The Company appreciates consideration of its comments. Please contact Aaron Gibson (801-756-1201), aaron.gibson@rockymountainpower.net, with any questions.

Sincerely,

Aaron Gibson
Customer and Community Manager

Thank you for your comment, Sally Miller.

The comment tracking number that has been assigned to your comment is SEDDsupp20106.

Comment Date: January 27, 2012 10:54:38AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20106

First Name: Sally
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Last Name: Miller
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Attachment: 1-27-2012 SPEIS comments FINAL+Appendix.pdf

Comment Submitted:

Please accept these comments on behalf of Audubon California, California Wilderness Coalition, Defenders of Wildlife, Natural Resources Defense Council, Sierra Club and The Wilderness Society.

Thank you.

AUDUBON CALIFORNIA
CALIFORNIA WILDERNESS COALITION
DEFENDERS OF WILDLIFE
NATURAL RESOURCES DEFENSE COUNCIL
SIERRA CLUB
THE WILDERNESS SOCIETY

January 27, 2012

Delivered via electronic submission to the BLM Solar PEIS website and U.S. mail

Ms. Shannon Stewart
Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue – EVS/240
Argonne, IL 60439
Submitted via U.S. Mail and Email

RE: Comments on Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (California portion)

Dear Ms. Stewart:

Following are comments on the Bureau of Land Management's (BLM's) and the Department of Energy's (DOE's) jointly prepared Supplemental Programmatic Environmental Impact Statement (SPEIS) for Solar Energy Development in Six Southwestern States, submitted by Audubon California, California Wilderness Coalition, Defenders of Wildlife, Natural Resources Defense Council, Sierra Club and The Wilderness Society. Our organizations have been deeply involved in protecting California's public lands for decades and, more recently, in renewable energy development throughout the state, especially in the desert region. These comments are specific to California, and we hope you will give them serious consideration.

I. Introduction.

We appreciate that the Department of the Interior (DOI) has recognized via the issuance of the SPEIS the wisdom of adopting a "directed development" approach to large-scale solar energy development on the west's public lands, as reflected in the modified solar energy development program alternative. We applaud this modified approach and believe it will lead to the best large scale solar development projects located in the most suitable places on our public lands.[1]

[1] We believe that large scale solar development on appropriate private lands within the California desert is not only feasible but essential, and are pleased to see BLM acknowledge the importance of public-private land use planning for solar energy development in the SPEIS. See, e.g., SPEIS at p. 2-29. There may also be potential for development of some large-scale solar on Department of Defense (DOD) lands; see, e.g., http://www.serdp-estcp.org/News-and-Events/News-Announcements/Program-News/DoD-study-finds-7-000-megawatts-of-solar-energy-potential-on-DoD-installations-in-Mojave-Desert ("The study concludes that 25,000 acres are 'suitable" for solar development' on DOD lands in the Mojave Desert.")

We strongly believe that, ultimately, the success of the DOI's and the BLM's solar energy program depends on developing policy and guidelines that will guide projects to the most appropriate locations, thus limiting environmental impacts and facilitating the timely construction of the most appropriate projects. We appreciate the DOI's commitment to zone-based development, as expressed not just in this supplemental document but also in the remarks of officials at the time the supplement was released. See, e.g., Department of Interior news release, October 27, 2011; http://www.blm.gov/wo/st/en/info/newsroom/2011/october/NR_10_27_2011.html.

We look forward to working further with the DOI and the BLM to ensure that: 1) appropriate Solar Energy Zones (SEZs) are identified and designated; 2) solar projects are guided to those zones via appropriate development incentives in the zones; 3) additional information needed to ensure "smart from the start" development is incorporated into regional mitigation plans and SEZ-specific project design features; 4) additional policy and/or plans needed to support a comprehensive and environmentally responsible solar energy development program on our public lands are adopted; and 5) the decisions made in the Final PEIS are integrated into and coordinated with the Desert Renewable Energy Conservation Plan (DRECP) planning effort for the Mojave and Colorado deserts of California, and the BLM remains committed to managing its lands in the California desert in conjunction with the DRECP.

The proposal to make some BLM lands open to "variance" applications is new, and, if included in the final program, must be accompanied by measures to ensure that such applications and any resulting projects are the exception, not the rule.[2] The additional lands we believe should be excluded from variance applications are detailed below and in our comments on the Draft PEIS,[3] which we fully incorporate by reference herein. We recommend that DOI acknowledge that any variance applications considered after adoption of the Final PEIS and before adoption of the DRECP must be consistent with the developing DRECP conservation strategy pursuant to the "consistency" requirements of the California's Natural Communities Conservation Planning Act of 2003. See California Department of Fish and Game sections 2800, et seq.[4]

The deserts of California are particularly vulnerable to climate change; in fact the California Desert has been determined to be a "hot spot" for climate change. See, e.g., http://www.stanford.edu/~omramom/Diffenbaugh_GRL_08.pdf. While large-scale solar facilities may help to alleviate the effects of climate change and we therefore believe they need to be developed promptly, they have very direct impacts on the fragile desert landscape and its inhabitants, which could be exacerbated by climate change. The DOI and the BLM thus have a careful "balancing act" to do to ensure that solar development occurs in the most appropriate locations for such development while not irreversibly harming the ability of desert inhabitants to adapt to climate change.

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[2] Some of our organizations previously supported a well-defined and limited "variance" process. See letter of May 2, 2011 from California Desert Renewable Energy Working Group to Robert Abbey, Director, BLM.

[3] See NRDC, et al, April 29, 2011.

[4] Similarly, the consideration of new SEZs within the California Desert Conservation Area should also be consistent with the DRECP.

Our comments are organized as follows: We first discuss the California Desert Conservation Area (CDCA) and the DRECP; both the California-specific designation and the California-specific planning initiative have important relevance to the SPEIS. Next we discuss our recommendations for fine-tuning the California SEZs, followed by comments on recommended exclusion areas that we raised in our comments on the Draft PEIS and which we feel are not sufficiently addressed in the SPEIS. We call your attention to section six, in which we make recommendations for improving protection for the desert tortoise, a bellwether species for the California desert. Finally, we discuss issues raised by the supplement, including pending applications, and provide our recommendations for improving the maps and data that are presented in the SPEIS.

II. The California Desert Conservation Area.

Congress established the CDCA in 1976. See Section 601 of the Federal Land Policy and Management Act (FLPMA), 43 U.S.C. §§ 1701 *et seq*. In enacting this statute, Congress found that "the California desert environment is a total ecosystem that is extremely fragile, easily scarred, and slowly healed" and stated that its "purpose" in designating the CDCA was "to provide for the immediate and future protection and administration of the public lands in the California desert …, and the maintenance of environmental quality." Id., §§ 1781 (a)(2), (b). Congress further directed the preparation of "a comprehensive, long-range plan" for the CDCA with public participation. Id., §§ 1781 (a) (6), (d).

While we recognize that times have changed and additional demands for uses of public lands within the CDCA for renewable energy development have arisen, we nonetheless underscore the importance of FLPMA's provisions for the CDCA, and the importance of the CDCA to our organizations and the millions of Americans who annually utilize and enjoy these lands. Public lands within the CDCA are important for their historical, scenic, archaeological, environmental, biological, cultural, scientific, educational, recreational and economic resources, and there is strong public support for preserving these lands and their multiple resource values. We believe BLM's directed development approach will best help to meet state and federal renewable energy goals while preserving public lands and resources of key importance within the CDCA.

In addition to the provisions of FLPMA for the CDCA, the preferred alternative in the SPEIS and each of the alternatives needs to be consistent with the overall goals and objectives for management of public land resources, including but not limited to wildlife and vegetation, as contained in the CDCA plan, as amended. We emphasize the importance of this requirement by citing the following language from the BLM:

> "[T]he intent of the CDCA Plan is to ensure as nearly as humanly possible that the recognition brought by Congress and the people into law—that the California Desert is not a wasteland but a precious public resource—is effectively guaranteed in its management, that the uses of today do not preclude the users of tomorrow, and that we preserve and develop these assets wisely with full regard for their social and environmental as well as economic values.

CDCA Plan, as amended, p. 7 (1980).

III. The Desert Renewable Energy Conservation Plan and the SPEIS.

We thank the BLM for acknowledging the importance of the DRECP and affirming its commitment to the DRECP process, an issue we raised in our comments on the Draft PEIS. We believe it is critically important that the decisions made in the Final PEIS and the accompanying Record of Decision (ROD) are integrated into the DRECP process and that the BLM commits in the Final PEIS to managing its lands in the California desert consistent with the DRECP as provided in FLPMA.

We especially appreciate BLM's commitment to: "rely on the California DRECP planning effort…to identify new or expanded SEZs" (SPEIS at p. 2-28); "use the DRECP as the foundation for possible amendments to the CDCA Plan and three RMPs" (id. at p. 2-29); and "identify priority areas for renewable energy development (potentially through the identification of additional SEZs) and associated conservation on BLM lands within the DRECP planning area" (id. at p. 2-29). That being said, we recognize and appreciate that the Solar PEIS is a stand-alone document, and that it contains a mechanism to identify new SEZs in the future independent of other planning processes. See, e.g., SPEIS at p. 2-29, Appendix D.

Additional coordination is needed between the BLM and other agencies involved in the DRECP process. Specifically, we believe BLM should take the following actions to ensure improved coordination and consistency between the Solar PEIS and the DRECP:

1. The BLM and the DOI should take steps to ensure that the Final PEIS, ROD and the solar program that is established afford sufficient flexibility to permit compliance with FLPMA's "consistency language," which requires that BLM land use plans "be consistent with State … plans to the maximum extent [the Secretary] finds consistent with the Federal law and the purposes of this Act." 43 U.S.C. § 1712 (c)(9). The ROD signed for the Final PEIS should not pre-empt the DRECP nor preclude conservation on BLM lands that may be identified for such purposes via the DRECP. In other words, DOI and the BLM need to ensure that the PEIS, accompanying ROD and the new solar program are consistent with the mandates of FLPMA, but also that the Bureau retains sufficient flexibility to ensure consistency with recommendations for BLM lands that may be developed via the DRECP.
2. The BLM should specifically list or describe (e.g., via an appendix to the Final PEIS) potential public or combined public-private (i.e., "conjunctive") lands that have been suggested by stakeholders during the PEIS process as having the potential to be designated as additional solar development zones and that could be subject to intensive review and analysis in the DRECP planning process. Examples include the specific areas that have been suggested by our organizations in the Daggett Triangle and Western Mojave areas of California.[5]

   We appreciate that the BLM has already issued a Draft EIS for potential renewable energy development within the West Chocolate Mountains Renewable Energy Evaluation Area (July 1, 2011), an area which was suggested by several of our organizations and others.
3. The BLM indicates that SEZ-specific regional mitigation plans will be developed, and that initial regional mitigation plans will be presented in the Final PEIS. SPEIS at p. 2-24. Development of plans that fall within the DRECP planning area should be coordinated with the other agencies in the Renewable Energy Action Team (REAT), so that the range

[5] See Appendix C to Draft PEIS comments of NRDC, et al.

of feasible mitigation measures across both public and private lands can be identified and analyzed. BLM should clarify in the Final PEIS that it will coordinate with the DRECP planning effort in the development of those plans that affect the DRECP planning area, and that it will manage the public lands within the CDCA consistent with the DRECP to the maximum extent possible under FLPMA.

IV. Proposed Solar Energy Zones.

We appreciate that some of our comments and recommendations on the four proposed SEZs that were presented in the Draft PEIS were incorporated into the SPEIS. In particular, we very much appreciate that both the proposed Pisgah and Iron Mountain SEZs were dropped, although, as discussed below, we believe that the Pisgah SEZ should be completely excluded from solar development, as was Iron Mountain. For each of the remaining two SEZs, Riverside East and Imperial East, we recommend that the BLM include in the Final PEIS a chart that identifies not only the additional land and resource data that are needed to perform necessary analyses but also who is responsible for compiling the data and completing each item listed, and a timetable for completion of the individual tasks. We also request that BLM commit to accepting and responding to comments on the SEZ-specific regional mitigation plans and design guidelines that are presented in the Final PEIS.[6]

Within specific SEZs, we recommend that a tiered mitigation strategy be adopted entailing, in priority order, 1) impact avoidance, 2) impact minimization and 3) compensation for unmitigated impacts through off-site habitat acquisition and enhancement for key species and their habitats. The feasibility of compensatory habitat acquisition and enhancement must be verified so that needed actions can be implemented in a timely and effective manner.

A. Iron Mountain.

We thank the BLM for deleting the proposed Iron Mountain SEZ, and for recognizing concerns about this SEZ that were raised by numerous stakeholders including conservation organizations, solar industry developers, utilities and others. We also thank the BLM for identifying the proposed Iron Mountain SEZ as an "exclusion area" in Table 2.2-1 (SPEIS at p. 2-17). The area's extremely high value wilderness and other resources coupled with the lack of nearby or planned transmission amply justifies this decision. We remain concerned, however, that substantial acreage within the Citizens'-proposed Iron Mountain Wilderness, which partially overlaps the former SEZ, remains open to variance applications; we request that this area be added to the list of exclusion areas. Please see our comments and a map showing the overlap in Appendix A.

B. Pisgah.

We thank the BLM for deleting the proposed Pisgah SEZ. However, we oppose these lands remaining open to variance applications. See SPEIS at B-14. The area contains superlative resources, including:

- Twelve special status species;
- Habitat that provides essential connectivity between the western Mojave, eastern Mojave and northern Colorado deserts;

[6] As well as other sections the BLM says will be presented in the Final PEIS.

- A significant drainage from the Cady Mountains that has not been mapped by the National Wetlands Inventory;
- Lands acquired with private conservation funds and Land and Water Conservation Fund monies (775-1700 acres);
- Desert tortoise habitat and connecting corridors;
- Desert bighorn sheep habitat and potential to disrupt metapopulations and intermountain movements;
- Golden eagle habitat;
- Mojave fringe toed-lizard habitat;
- Rare plants, including white-margined beard tongue (*Penstemon albomarginatus)*, *Androstephium breviflorum* and *Castela emory*.
- Significant cultural sites.

See comments of NRDC at al. on Draft PEIS. The same reasons we advanced in opposition to the designation of these lands as a SEZ support their designation as an exclusion area that is not subject to variance applications.

As previously noted, in our comments on the Draft PEIS we suggested that BLM assess the "Daggett Triangle," three combined public-private land areas totaling more than 16,000 acres located west of the proposed Pisgah SEZ. We request that these areas be specifically identified in the Final PEIS as public and/or combined public-private lands that may be appropriate for further analysis as part of the DRECP as a public/private solar zone.

C. Riverside East.

We thank the BLM for addressing a number of our site-specific concerns within the proposed Riverside East SEZ. BLM has designated "no development" areas for 11,547 acres within the SEZ, including a portion of McCoy Wash, Ford Dry Lake and Palen Dry Lake, and areas previously identified for non-development through site-specific project level NEPA analysis.[7] Additionally, BLM has reduced the size of the SEZ by 43,439 acres, eliminating other areas of concern to our organizations (e.g., Pinto Wash, Upper Chuckwalla Valley). We appreciate these modifications.

Nonetheless, we believe this SEZ will benefit from further fine-tuning, and we have the following recommendations. Some of these issues were raised in our comments on the Draft PEIS; we also bring to your attention several issues that have surfaced since issuance of the Draft PEIS.

Issues Raised in Previous Comments on Draft PEIS, Riverside East SEZ.

1. Connectivity areas for habitat, wildlife and climate change adaptation.

[7] While we welcome these decisions, we believe the public needs more clarity about them. The BLM should provide readily accessible maps that will enable stakeholders to clearly understand which areas have been eliminated from potential development within the Riverside East SEZ. For example, we are confused as to what part of McCoy Wash is proposed for non-development. See detailed comments under Microphyll Woodlands and in section IX.

In our comments on the Draft PEIS, we requested that the BLM identify key connectivity areas to preserve habitat integrity for a variety of wildlife and plant species now and into the future as our planet's climate changes.[8]

Due to the linear nature of the Riverside East SEZ and the potential of solar development in this SEZ to sever connections between the Sonoran and Mojave ecosystems, the BLM must provide landscape level habitat linkages within and across this SEZ (e.g., for desert tortoise, Mojave fringe-toed lizard, desert bighorn sheep, etc). We recommend that such movement corridors be roughly delineated via the process of developing the SEZ-specific design features and the initial regional mitigation plan for the Riverside East SEZ, and that they be further refined at the project-specific level.

The BLM should coordinate the mapping of wildlife and habitat linkages with other agencies via the REAT and the DRECP planning process. In fact, the BLM now has good access to data, the Western Wildlife Crucial Habitat Assessment Tool (CHAT). This initiative should assist the agency and its partners in identifying critical habitat and wildlife linkages, or corridors, which should be protected by the SPEIS and the DRECP. See Instruction Memorandum (IM) No. 2012-039; see also http://www.blm.gov/wo/st/en/info/regulations/Instruction_Memos_and_Bulletins/national_instruction/2012/IM_2012-039.html.

We also are concerned that the SPEIS fails to acknowledge the importance of preserving migratory bird pathways and stopovers on the Pacific Flyway. Migratory birds can be affected by solar development, particularly power towers. The BLM should also work with the REAT to ensure that the appropriate data are collected and migratory bird pathways and stopovers are mapped as promptly as possible and preserved in the future. If sufficient data are not now available, we request that BLM require the gathering of data for migratory bird pathways and stopovers for all site-specific power-tower projects that are proposed within the vicinity of the Riverside East SEZ (including any projects that are proposed outside the SEZ within variance areas nearby). We also request that BLM require strict monitoring and utilize "adaptive management" in its processing and management of power tower proposals throughout the California desert, so that these projects can be adjusted over time as needed to minimize impacts on resident and migratory birds.

The preservation of habitat connectivity is not only important in the Riverside East SEZ, but throughout the California desert. We request that BLM commit to working with other agencies with jurisdiction in the desert to develop a plan for protecting these areas, especially in light of climate change.

2. Sand Transport, sand transport corridors and sand source areas.

[8] A recent scientific paper indicates the importance of maintaining plant species richness in the face of climate change: "Our results suggest that the preservation of plant biodiversity is crucial to buffer negative effects of climate change and desertification in drylands." See Maestre et al, http://in.bgu.ac.il/SiteAssets/Pages/news/Plant_Species_Richness/Science%20Plant%20Species%20Richness%20and%20biodiversity.

The SPEIS has improved the proposed Riverside East SEZ by incorporating "non-development" areas within the SEZ, presumably in part to avoid the critically important sand transport corridors and sand source areas. However, as proposed, the "non-development" areas do not include all areas of the sand transport corridor as identified by several sources. Muhs et al. (2003) specifies a much larger area of Aeolian sand in the SEZ. In 2011, the California Public Utilities Commission undertook additional investigation and identification of the sand transport corridor in this area.[9] In their review, the sand transport corridor is much more extensive, originating in the Pinto Basin of Joshua Tree National Park, the Palen Valley and the Palen/McCoy Valley and extending eastwards to the edge of the agricultural development in the Palo Verde Valley south of Interstate 10.

The BLM should exclude additional contiguous areas of the sand transport corridor and sand source areas, via the SEZ-specific regional mitigation plan and/or in the SEZ-specific design features, for a number of reasons. First, disruption of sand transport corridor functionality near corridor sources affects all downwind resources. Secondly, sand dune habitat is a rare resource on the landscape and because the geological and geographical features that transport sand and form dunes are extremely limited, the species that have evolved to rely on this unique habitat are also quite rare and typically endemic only to dune systems. Because of the uniqueness of the Aeolian habitat, impacts to sand transport systems are therefore comparatively greater than to other habitat types. Impacts are also much more challenging to mitigate because of the limited habitat type and complex Aeolian requirements that form and maintain the sand transport and dune habitat. Lastly, any facility put in or even adjacent to a sand transport corridor will suffer significant impacts from sand abrasion and require regular clearing of sand from the structures, increasing maintenance and operational costs.[10]

The final program needs to ensure the consistent conservation of sand transport corridors and sand dune areas across the region, and not just in the Riverside East SEZ. Several additional corridors and dune systems have been identified within the CDCA.[11] As previously stated in our comments on the Draft PEIS, models have also been developed to identify conservation areas that are essential to maintain sand transport corridors.[12] These data and models should be incorporated into the analysis and key areas that maintain the Aeolian function of the sand transport corridors should be included as BLM-administered lands not available for solar development.

3. Microphyll woodlands.

We appreciate that the BLM appears to have identified a portion of McCoy Wash, containing important microphyll woodland habitat, as a "non-development area" within the Riverside East SEZ. However, the BLM also appears to have left a substantial amount of acreage of this important habitat type potentially open to development, an action that could place this key ecosystem at risk. [13] In numerous conversations our organizations have had with BLM staff, they

[9] See ESA-PSW 2011 www.cpuc.**ca**.gov/environment/info/aspen/dpv2/sfeir/apps/ap3.pdf
[10] The lifespan of these projects also will likely be decreased.
[11] See Muhs 2003
[12] See, e.g., Barrows 1996
[13] For example, the red line on the map on p. C-59 that we presume indicates McCoy Wash does not appear to adequately protect the microphyll woodlands in McCoy Wash. See section IX below.

have expressed the belief that, given the extensive acreage of this habitat type included in the Right of Way issued for the Blythe solar energy project, no additional loss of microphyll woodland habitat should be permitted. We request that additional microphyll woodland habitat within the Riverside East SEZ be identified for non-development via SEZ-specific design features and/or the SEZ-specific regional mitigation plan for Riverside East. BLM carefully mapped this habitat type ("Desert Dry Wash Woodland") as part of the Northern and Eastern Colorado Desert (NECO) Management Plan (2002). See NECO Plan, Map 3-3. These mapping data should be used as the foundation for identifying additional microphyll woodlands for non-development within the SEZ, through SEZ-specific design features and/or the regional mitigation plan for the Riverside East SEZ.

Issues Raised Since Release of Draft PEIS, Riverside East SEZ.

Since the Draft PEIS was released, several issues have arisen that the supplement has not analyzed. These issues should be addressed in the Final PEIS, subsequent management plan amendments, the regional mitigation plan, through SEZ-specific design features and/or at the project-specific level.

1. Lands with wilderness characteristics.

Since the Draft PEIS was issued, BLM conducted an inventory of "Lands with Wilderness Characteristics" (LWC) pursuant to Section 201 of FLPMA and IM 2011-154. The results of this inventory in the Riverside East SEZ are presented in the SPEIS at p. C-60. The inventory identified 11,925 acres of LWC, approximately 7,175 acres (60%) within the Riverside East SEZ (approximately 40% of the LWC lie just outside and west of the Riverside East SEZ). Large-scale solar energy development and the preservation of LWC are inherently incompatible, and we request that the LWC identified within this SEZ be removed from the SEZ or identified as a "non-development" zone within the SEZ.[14]

The LWC identified by the BLM that are within the Riverside East SEZ overlap with other areas of importance that we have previously argued should not be developed. These include dissected (alluvial) fan habitat important to desert tortoise,[15] and microphyll woodland habitat which has not been adequately protected by the delineation of McCoy Wash. It should also be noted that the LWC identified on the map on page C-60 of the SPEIS appear to overlap closely with the microphyll woodland habitat that is located in the western portion of the proposed McCoy Solar project.

The LWC outside the SEZ are also adjacent to the Palen-McCoy wilderness, and are proposed as a variance area. We request that the LWC identified outside the Riverside East SEZ be added to the list of exclusion areas. The BLM should recommend these lands as an addition to the designated wilderness and manage them in the interim to protect their wilderness characteristics. The fact that these lands are located in a major wash makes them a poor potential site for solar development. The area is also home to several sensitive species, including California leaf-nosed bat, desert tortoise, California McCoy snail, Harwood's milk-vetch and Las Animas colubrina.

[14] If this does not happen, then the BLM should devise mitigation at the project-specific level to mitigate for the loss of wilderness characteristics.
[15] See discussion below.

2. Dissected fans.

Since the Draft PEIS was issued, three projects have been approved within the proposed Riverside East SEZ.[16] During the processing of each of these project applications, the U.S. Fish and Wildlife Service identified "dissected fans" as important habitat for the Threatened desert tortoise. The following language is from the Fish and Wildlife Service's Biological Opinion on the Desert Sunlight project:

> We recommend that the BLM amend the CDCA Plan to prohibit additional renewable energy development (i.e., utility-scale solar and wind energy facilities) within the upper bajadas (mapped as "dissected fans" on the Landforms Map 3-4 in BLM 2002) adjacent to the mountains of northeastern Riverside County. This recommendation is intended to protect the higher quality desert tortoise habitats in the recovery unit.

Desert Sunlight Biological Opinion; 7/6/2011. See http://www.blm.gov/pgdata/etc/medialib/blm/ca/pdf/palmsprings/desert_sunlight.Par.83759.File.dat/Desert%20Sunlight%20BO.pdf. There is similar language in the Biological Opinions for the other projects.

Due to the importance of preserving dissected fans for desert tortoise, we recommend that the BLM identify and map the dissected fans and include measures to avoid development in these habitats in the forthcoming design features, regional mitigation plans and site-specific project level analyses.

3. Visual Resource Management Class II & III height limits.

The BLM has proposed ten foot height limits on solar infrastructure within the Riverside East SEZ, consistent with criteria for Visual Resource Management (VRM) Class II & III lands; these are proposed as "visual resource mitigation requirements." SPEIS at p. C-58-59. While we appreciate the BLM's acknowledgement of the visual impacts of large scale solar development, we are concerned about the fact that the proposed limitations on development within the SEZ for visual reasons will effectively limit the technology that can be utilized in these areas. Of greater concern, these limits also put increased pressure on the BLM to allow development in areas outside the SEZ, e.g., in variance areas. Most importantly, the proposed limits significantly reduce the acreage of the proposed SEZ. If further reductions in the size of the Riverside East SEZ are going to occur, we strongly prefer they be for biological or cultural reasons, e.g., designated wildlife movement corridors, desert tortoise habitat connectivity areas, etc., rather than to minimize visual impacts. Large scale solar developments inherently have significant visual impacts, and such impacts need to be accepted as part and parcel of such development.[17]

D. Imperial East

The BLM should adopt SEZ-specific design features for the proposed Imperial East SEZ to help mitigate for impacts to the flat-tailed horned lizard consistent with the rangewide management

[16] I.e., Desert Sunlight, Blythe and Genesis solar projects.

[17] We do believe that visual impacts can and should be mitigated via the development of site-specific design features and mitigation measures identified in the initial regional mitigation plan for the Riverside East SEZ; both the design features and the regional mitigation measures should be included in the Final PEIS. Site-specific visual impacts should also be mitigated on a project-level basis.

strategy for the Flat-tailed horned lizard, and with the management goals and objectives for the East Mesa Wildlife Habitat Management Area. Protections for the flat-tailed horned lizard should also be incorporated into the initial regional mitigation plan for this SEZ.

We appreciate that the BLM has designated five acres of wetlands within this SEZ as a non-development area.

V. Exclusion Areas.

We appreciate that the BLM has made modifications to the list of exclusion areas originally proposed, i.e., those areas that will not be subject to variance applications. See Table 2.2-1 (SPEIS at p. 2-16). We are particularly pleased that the following areas were added to the list of exclusion zones:

- Lands within Mojave Trails National Monument, including proposed wilderness areas;
- Lands encompassed by the (withdrawn) Iron Mountain SEZ;
- Non-development lands identified in EISs for already approved solar energy projects (e.g., Genesis, Blythe and Desert Sunlight);
- Lands proposed for transfer to the National Park Service.

We believe that the following lands and land use categories identified immediately below should also be added to the list of exclusion areas. These areas were identified as candidates for exclusion in our previous comments.[18] We also recommend desert tortoise proposed connectivity areas for exclusion; see section VI.

1. Citizens Wilderness Proposals.

While we appreciate that citizens' proposed wilderness within the proposed Mojave Trails National Monument and proposed additions to Death Valley National Park wilderness were excluded, parts of four citizens'-inventoried proposed wilderness areas[19] remain open to variance applications: Bighorn Mountain, Iron Mountain, Palen-McCoy and Volcanic Tablelands. Additionally, lands proposed for variance applications overlap with 20,600 acres of the Vinagre Wash Special Management Area in Senator Feinstein's California Desert Protection Act legislation (2011) and with acreage in the McCoy Wash area that contains LWC as identified by the BLM, which we discuss above. Please see Appendix A to these comments for a detailed description of these areas provided by the California Wilderness Coalition and our reasons why they should be excluded from development.

2. Wildlife Habitat Management Areas.

Wildlife Habitat Management Areas (WHMAs) were established by the BLM in its management plan for the CDCA, and subsequent amendments to the plan, each of which was subject to extensive public participation. See, e.g., Northern and Eastern Colorado Plan Amendment, 2002; West Mojave Plan Amendments, 2006; CDCA Plan Amendments, 1981-1990. According to the wildlife element of the CDCA Plan, WHMAs and their associated site-specific plans are one of

[18] For more detail on these and other proposed exclusion areas see our comments on the Draft PEIS.
[19] The inventory of these public lands as potential wilderness areas was coordinated by the California Wilderness Coalition. Bighorn, Iron Mountain and Volcanic Tablelands were inventoried between 1998-2001; Palen-McCoy in 2006.

two primary management tools designed to achieve the objective of the CDCA to protect wildlife habitat important to a suite of species. As we have previously requested, the BLM should include WHMAs as a new category of exclusion areas or under criteria #8. See SPEIS at p. 2-16.[20]

Because proposed development in WHMAs is bound to be controversial,[21] designating the WHMAs as exclusion areas will save BLM and developers time and money, and avoid costly delays.

3. Golden Eagle habitat.

In our comments on the Draft PEIS, we asked that the BLM take special care to protect Golden Eagle, a fully protected species under the Bald and Golden Eagle Protection Act of 1940. The SPEIS, however, does not acknowledge the importance of Golden Eagle.

Specific lands important to Golden Eagle as nesting territories and associated foraging habitats should be excluded from variance applications. These lands include the WHMAs, as mentioned above (some are of particular importance to Golden Eagle), and additional lands as appropriate that have been designated by the BLM as "Key Raptor Areas" and which are within proposed variance areas.

4. Ivanpah Valley Public Lands.

The Ivanpah Valley is a unique valley spanning the state line between California and Nevada. Because of this political boundary, impacts to biological resources from renewable energy developments in different parts of the same valley are evaluated by different states. The Ivanpah Valley is important because it is home to a dense population of the federally threatened desert tortoise as well as rare plant communities. A small portion of the valley in California is designated as a desert tortoise Area of Critical Environmental Concern (ACEC) under the Northern and Eastern Mojave Plan. A portion of federally designated critical habitat is also identified in the southeastern part of the valley.

Surveys on both sides of the state line indicate an extant, robust population of desert tortoise. In fact, the U.S. Fish and Wildlife Service's (FWS) October 10, 2010 Biological Opinion on the Ivanpah Solar Electric Generating Station (ISEGS), which is located in the southwestern part of the valley, states at p. 63: "We recommend that the Bureau amend the California Desert Conservation Area Plan to prohibit large-scale development (e.g., solar energy facilities, wind

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[20] In Table 2.2-1, BLM has already identified as exclusion areas

> "All areas where…*BLM has made a commitment to take certain actions* with respect to sensitive species habitat..."

(Emphasis ours.) The BLM should clarify in the Final PEIS specifically which "certain actions" are meant to be included in this category of exclusion areas.

[21] As our experience with the Desert Sunlight Project attests: the fact that a WHMA was located within the proposed project area required additional time to resolve this project with the company. Other projects proposed or permitted that overlapped to varying degrees with WHMAs include the Palen Solar Power Project and Genesis Solar Energy Project.

development, etc.) within the area bounded by Interstate 15, the State line, and Clark Mountains." This recommendation was limited to the land on the California side of the border, because the local office of the consulting agencies' jurisdiction was in California.

As the BLM is well aware, the ISEGS project quickly reached its "take" limit of desert tortoises and had to re-initiate consultation with the Service, which resulted in a new Biological Opinion on June 10, 2011. In the new Biological Opinion, the FWS expanded its recommendation to include the whole of the Ivanpah Valley, stating "We recommend that the Bureau amend the necessary land use plans to prohibit large-scale development (e.g., solar energy facilities, wind development, etc.) within all remaining portions of the Ivanpah Valley to reduce fragmentation within the critical linkage between the Ivanpah Critical Habitat Unit and the Eldorado Critical Habitat Unit." (at pg. 92-93). This new recommendation recognizes that the whole valley is important to the survival of this population of desert tortoise, and that the linkage between the Ivanpah Critical Habitat Unit, which is in California, and the Eldorado Critical Habitat Unit, which is in Nevada, must be kept intact.[22] In line with the direction already identified by the FWS, BLM-administered lands within the Ivanpah Valley should be included as an exclusion area not available for further solar development.

Although BLM is undertaking a new cumulative effects analysis for a portion of the Ivanpah Valley (and which does not include much of the valley in Nevada), it has not finished the analysis. Nor has the BLM developed either a comprehensive bi-state assessment or a long-term management plan for this important valley. Meanwhile, the entire Ivanpah Valley has been nominated as an ACEC, in order to provide further safeguards for the desert tortoise in this important valley as well as a suite of very rare plants and significant cultural values present there. To avoid further degradation of the valley, we urge that it be excluded from solar development.

5. Lands Acquired for Conservation.

As previously noted in our comments on the Draft PEIS, the BLM should exclude lands that were purchased with Land and Water Conservation Funds and donated to BLM for conservation purposes from being subject to variance applications.

VI. Desert Tortoise.

The desert tortoise is a bellwether species for the Mojave and Sonoran desert ecosystems. Listed as a federal threatened species by the FWS in 1990, desert tortoise numbers remain low in spite of ongoing recovery efforts, and this animal remains in an imperiled state. Since renewable energy development has the potential to significantly and irreversibly affect desert tortoise populations and the ability of this iconic species to recover, it is essential that the DOI adopt standards for solar energy development in the Final PEIS that will provide for the recovery of desert tortoise populations and the species as a whole. These standards should include: 1) the protection of key habitat for the desert tortoise, including occupied and unoccupied but

[22] See also Hagerty, B.E., K.E. Nussear, T.C. Esque, and C.R. Tracy. 2010. Making molehills out of mountains: landscape genetics of the Mojave desert tortoise. Landscape Ecology. DOI 10.1007/s10980-010-9550-6.

suitable habitat, and 2) the protection of key connectivity habitats and linkages for the desert tortoise.

We recommend that the United States Geological Survey (USGS) desert tortoise habitat suitability model[23] and desert tortoise density be used to provide interim criteria for areas where variance applications will be accepted but also recognize that development of a more detailed model is needed to guide conservation of the species at the appropriate scale required for solar project siting. The USGS desert tortoise habitat suitability model was intended to provide guidance for conservation planning at the range-wide scale, and represents the most comprehensive effort to define suitable habitat for the species to date. The one kilometer cell size used for this analysis and the emphasis on topographical, soil, and meteorological data as predictors make the model useful for predicting at the landscape-scale, but they do not provide the needed precision for analyses at the sub-regional scale or at the solar project sitting level. Until additional refinement of a habitat model is completed by FWS, the following criteria should be met:

For applications in variance areas that are within the range of desert tortoise but outside of proposed connectivity areas, (as modified by our recommendations in these comments), the applicant must provide documentation of the following:

- Project area has less than or equal to 2 tortoises (>160 mm Midline Carapace Length) per square mile; and
- Where Habitat Potential Index Value is 0.7 or greater, verification that the habitat condition is "highly converted."[24] This verification should be provided through application of science-based models of land conditions through field inspection.

Our recommended criterion of two adult desert tortoises per square mile is based on current range-wide density estimates within recovery units that range from three to 36 per square mile.[25]

The predicted habitat suitability rating of 0.7 and above (on a scale of 0 to 1.0) is significant because 95% of the lands with a rating of greater than 0.7 in the USGS habitat suitability model also had confirmed presence of desert tortoises based on field survey data. This habitat model, based on 10 environmental factors that included soils, vegetation, precipitation, elevation, and topography, is a sufficiently robust, science-based model, for interim land use planning and conservation planning for the Desert tortoise and its habitat, but further refinements are needed to make habitat suitability predictions more accurate and precise, both to protect important habitat as well as to ensure that areas not important for the species are not mis-identified.

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[23] Nussear, K.E., T.C. Esque, R.D. Inman, L. Gass, K.A. Thomas, C.S.A. Wallace, J.B. Blainey, D.M. Miller, and R.H. Webb. 2009. Modeling habitat of the desert tortoise (*Gopherus agassizii*) in the Mojave and parts of the Sonoran Deserts of California, Nevada, Utah, and Arizona: U.S. Geological Survey Open-File Report 2009-1102, 18 p.

[24] "Highly converted" refers to urban, suburban and agricultural lands that are heavily altered. While some can support conservation targets, their ecological context is highly compromised.

[25] U.S. Fish and Wildlife Service. 2010. DRAFT Range-wide Monitoring of the Mojave Population of the Desert Tortoise: 2010 Annual Report. Report by the Desert Tortoise Recovery Office, U.S. Fish and Wildlife Service, Reno, Nevada. 49 pp.

Pursuing a model at finer scales would require the use of variables that directly or indirectly assess the resources used by tortoises when selecting habitat, such as the presence of plants used for forage, vegetation diversity, density of annuals vs. perennials, and so on. In addition, habitat connectivity analyses must be integrated with habitat suitability analyses in order to ensure that the focus is on preserving suitable and occupied habitat that is connected with other population areas as well as to ensure these connectivity areas themselves are preserved to provide meta-population persistence.

The USGS desert tortoise habitat suitability model does not account for urban development, habitat destruction/fragmentation, or natural disturbances that have lowered habitat quality in recent years. Thus, we recommend using The Nature Conservancy's (TNC's) Mojave Desert Ecoregional Assessment[26] and the Conservation Biology Institute's Framework for Effective Conservation Management of the Sonoran Desert in California[27] to exclude these lands as having little or no habitat or conservation value. We recognize that it may be necessary to verify the habitat condition through field inspection and to accurately assess the adult desert tortoise density. We also recognize that modeling of suitable desert tortoise habitat needs to be refined through further field study and analysis, and that updated models should be developed soon and applied to our recommended criteria in variance areas as they become available.

Successful recovery of the desert tortoise requires that existing populations and their higher rated habitats are protected from deleterious human impacts. If recovery actions are successful to the point of promoting population increases, lands included in our recommended Modified Option 2 where solar energy development would be inappropriate could be the very areas into which newly recruited tortoises would need to move in response to climate change or simply expand their population in response to successful recovery efforts.

Preserving connectivity between desert tortoise conservation areas is vital to promoting gene flow and maintaining and enhancing desert tortoise populations. Connectivity can only be preserved by maintaining intact landscape-level habitat, so it is critical that connectivity areas be conserved and protected.

We therefore strongly recommend that connectivity areas be excluded from development. We also recommend that the BLM's proposed connectivity habitats shown on Figure 2.2-2 (SPEIS at p. 2-36) be replaced with the connectivity (or "linkage") habitats recommended by the FWS in its comments on the Draft PEIS. See comments of U.S. Fish and Wildlife Service, Draft PEIS, May 6, 2011, Figure B-2. It is important to understand that agency's recommendations identified lands to be included in a "*…minimum linkage design necessary for the conservation and recovery*

[26] Randall, J. M., S.S. Parker, J. Moore, B. Cohen, L. Crane, B. Christian, D. Cameron, J. MacKenzie, K. Klausmeyer and S. Morrison. 2010. Mojave Desert Ecoregional Assessment. Unpublished Report. The Nature Conservancy, San Francisco, California. 106 pages + appendices. Available at: http://conserveonline.org/workspaces/mojave/documents/mojave-desert-ecoregional-2010/@@view.html.

[27] Conservation Biology Institute. 2009. A Framework for Effective Conservation Management of the Sonoran Desert in California. Prepared for The Nature Conservancy. 78 pp. + appendices.

of the Mojave population of the desert tortoise…" (FWS DPEIS comments, Figure B-2. Emphasis ours.

VII. Issues Raised by the Supplement.

A. Prioritization of Areas for additional data/analysis collection (via Action Plans).

The BLM notes at p. 2-41 of the SPEIS that it will "prioritize the collection of additional data and analysis (listed in the Action Plans in Appendix C of the SPEIS) in those SEZs that are most likely to be developed in the near future." We request that the BLM prioritize the Riverside East SEZ for such action. As the agency is well aware, there are additional projects presently being considered in this SEZ (see Appendix A of the SPEIS). The timely completion of additional analysis for this SEZ will facilitate development in the locations that are best suited for such intensive use in the fragile desert.

We also believe that an initial regional mitigation plan should be developed for the Riverside East SEZ and presented in the Final PEIS. Due to the number of SEZ-specific issues that need to be mitigated, early development of a regional mitigation plan for the Riverside East SEZ will ensure that projects are processed in a timely manner.

B. Pending Applications – CA projects.

Our organizations have reviewed the so-called "first in line" projects for California that are listed in Appendix A of the SPEIS. We believe the list for California needs to be revised.

Certain developers have gone through the permit review process, have ended up with rights of way and have proceeded not to develop approved projects (e.g., Blythe Solar Project, Imperial Valley Solar Project). This is an unconscionable waste of the BLM's time and taxpayer dollars. In order to prevent this situation from occurring in the future, the BLM needs to do two things: First, the BLM needs to tighten up its diligence requirements and weed out the companies that are not serious or capable of developing projects. Second, since the BLM is going to rely on IM 2011-060 and IM 2011-061 issued in February 2011 to process applications on this list, we would like to help the BLM prioritize the pending projects, using the criteria in the IM and our deep and widespread knowledge of the environment, to ensure that the projects BLM processes first are truly those that are the least problematic. For the projects that are problematic, sufficient time should be allotted for other development options to be found (e.g., suitable locations within SEZs or on degraded private lands) so that these projects are not processed or permitted in the original locations proposed.

As an example of what we consider a "problematic" project, we question why Broadwell Lake is still on BLM's list of first in line projects. The proposed project is within the proposed Mojave Trails National Monument, which is a proposed exclusion area. We believe this project should be rejected by BLM and removed from the list.

We also believe that the BLM should not approve projects in the California desert that are inconsistent with the developing conservation strategy within the DRECP planning area.

VIII. Cumulative Impacts.

Our organizations were disappointed not to see any further analysis of cumulative impacts in the SPEIS, either for the revised solar development program (including the variance areas), or for past, present and reasonably foreseeable development within the Riverside East and Imperial East SEZs. The BLM intends to defer these analyses to the Final PEIS. See, e.g., SPEIS at 2-80. We hope and expect to see a complete analysis of cumulative impacts in the Final PEIS, and look forward to providing comment on it.

IX. Mapping and Biological Information.

We appreciate the effort to provide spatial data via the SPEIS website to the public for further review and analysis of the information contained in the Draft PEIS and the Supplement. Where there is additional spatial data desired that is not included in the downloadable zip files, we request that the BLM develop a system to provide that information to the public. For those who do not have GIS capabilities, we request that the BLM publish more clearly defined maps of both the proposed SEZs and proposed variance areas in the Final PEIS.

The maps provided in the Supplement are inadequate as illustrated by the following three examples. First, there is no map provided of the proposed variance areas listed in Table 2.2-1. While the website contains a map of proposed variance areas,[28] it is at a coarse scale and it is difficult to tell exactly where the variance areas are located. Secondly, in the Riverside East SEZ, what we believe to be McCoy Wash is indicated by a red line but it is not listed as such nor is the width of the exclusion area for that particular area specified anywhere in the document or on the maps. See SPEIS at p. C-59. A further reconnaissance of this non-developable area near the McCoy Wash revealed that it was a less than one quarter mile-wide corridor running through the McCoy wash and microphyll woodland system that is actually greater than one mile wide. Lastly, the desert tortoise connectivity corridors map on p. 2-36 contains no citations or explanation of the data used to generate the map.

These and other problems with the presentation of maps and data[29] need to be remedied as soon as possible so that stakeholders understand what is being proposed and the potential impacts of the proposed action on the environment. We recommend that revised maps and relevant data be made available for public review as soon as possible via the website, and that they be included in the Final PEIS.

X. Conclusion.

We thank the DOI and the BLM for proposing an approach to solar energy development on public lands in California that will direct appropriate large-scale solar energy development needed to help alleviate the effects of climate change to specific locations that can best accommodate such development, ensure the timely development of projects and help ensure that the natural and cultural resources of the California desert are protected for future generations. We respectfully request that you incorporate our proposed modifications to

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28 http://solareis.anl.gov/documents/supp/maps/alternatives/Solar_Supplement_CA_Statewide_Poster.pdf

29 E.g., we recommend that the data used to develop the desert tortoise variance recommendations on pp. 2-36 – 2-37 be made available as soon as possible and be included as an appendix to the Final PEIS.

ensure that projects are limited to the most appropriate locations in order to avoid permanent damage to the very fragile web of life in the California deserts.

Sincerely,

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Attachments:

Appendix A: Proposed wilderness areas and Special Management Area that should not be included in variance zones.

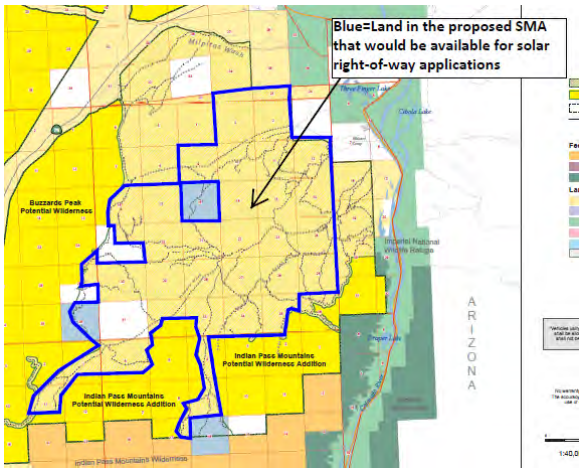
APPENDIX A

Proposed wilderness areas and other lands that should not be included in variance zones

Prepared by California Wilderness Coalition

The Proposed Vinagre Wash Special Management Area

Approximately 20,600 acres of the Vinagre Wash Special Management Area (SMA) that is proposed in Senator Dianne Feinstein's California Desert Protection Act of 2011 (S. 138) is zoned as a proposed variance area under the Modified Program Alternative in the SPEIS.

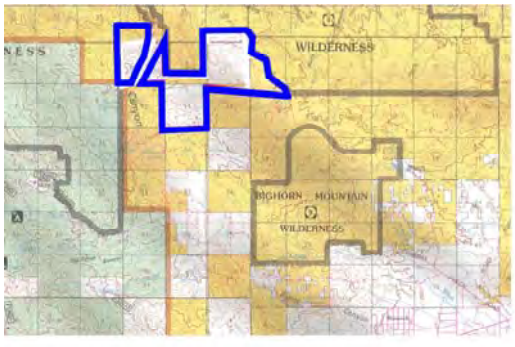


The proposed SMA should be excluded from the variance area because it is composed of extremely rugged, rolling terrain that is inappropriate for solar development and the portions that are relatively flat are in large washes that experience violent flash floods. In addition, the area is used by the US Navy for training purposes, it is popular for family recreation, it is adjacent to the Indian Pass Wilderness and lands that are proposed as potential wilderness in S. 138, it contains many important Native American cultural sites and it is known for its great ecological diversity and importance (for example, it includes one of the few Gila woodpecker populations to be found in California and the largest Sonoran desert woodland in North America). Lastly, many former private lands in the area were once owned by the Catellus Corporation and they were donated to the BLM with the specific understanding that they would be managed for conservation purposes.

Bighorn Mountain Proposed Wilderness Addition

There are several small parcels of proposed variance areas scattered across approximately 1,620 acres of this proposed wilderness addition.

We request that the proposed wilderness addition be excluded from the variance zone because this rugged, boulder-strewn landscape dotted with yucca, pinyon pines, Joshua trees and occassional Jeffrey pines is quite mountainous and is therefore completely inappropriate for solar development. The area is also too ecologically sensitive for it to be developed, since it is an important transition zone and wildlife migration corridor between the Mojave Desert and the San Bernardino Mountains. Mule deer, mountain lion, bobcat, golden eagles, Nelson's bighorn sheep and the southern rubber boa all call the area home.

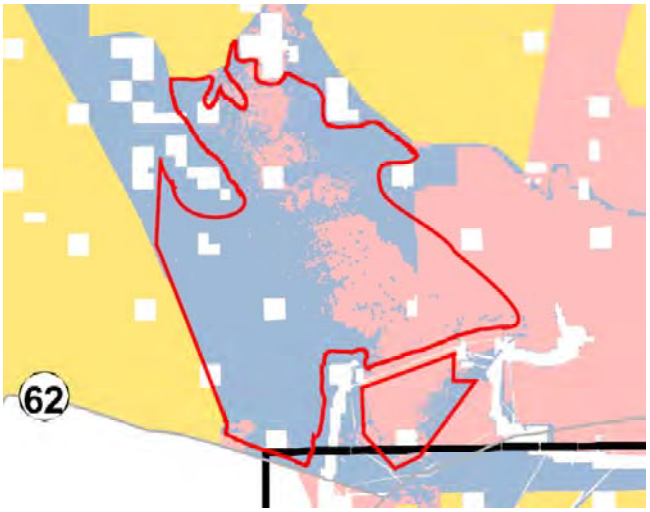


Bighorn Mountain Additions

The proposed addition was included in Senator Barbara Boxer's, Representative Hilda Solis' and Representative Mike Thompson's California Wild Heritage Act in the 107th-110th Congresses and it is possible that it could be included in future legislation as well.

Iron Mountain Proposed Wilderness

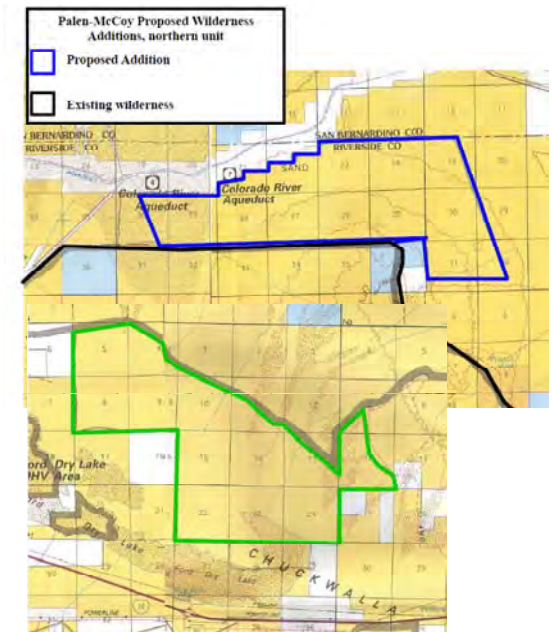
At roughly 120,000 acres, Iron Mountain is the largest remaining unprotected roadless area in California. The region is composed of the extremely rugged Iron Mountains, the Kilbeck Hills, sweeping bajadas, "perched" sand dunes (unusual dunes that are located atop cliffs) and playas. As is shown on the map at left, there is substantial acreage of proposed variance areas scattered across the majority of this proposed wilderness.



We request that the proposed wilderness addition be excluded from the from the variance zone because the region is a critical habitat corridor between the Old Woman Mountains Wilderness and the Sheephole Wilderness for Nelson's bighorn sheep. Other sensitive species known to live in the area include desert tortoise, Alverson's foxtail cactus, Harwood's eriastrum, small-flowered androstephium, Mojave fringe-toed lizard, prairie falcon and hepatic tanager. In the years ahead the importance of the proposed wilderness as both a corridor and as core habitat will continue to grow as lands to the south and east of Iron Mountain may be developed. Much of the proposed variance area between the Kilbeck Hills and the Iron Mountains currently consists of vast sand dunes that are also inappropriate sites for development because of the ecological importance shifting sands play in the Mojave Desert's ecosystem.

Palen-McCoy Proposed Wilderness Additions

The Palen-McCoy Wilderness contains immense valleys and four steep mountain ranges. It also includes bajadas, salt flats, washes, dunes and in some ways it is a microcosm of the Mojave Desert. While working on what became the Omnibus Public Land Management Act of 2009, staff of the CWC identified four wilderness-quality areas that could be added to the adjacent existing wilderness, two of which were added by Congress and two that were not.

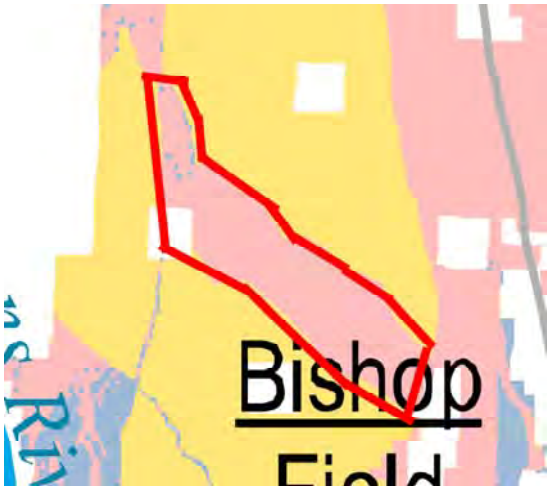


One of the remaining areas that has not yet been protected as wilderness is on the north (approximately 7,000 acres) and the other is on the south

(approximately 11,000 acres). These areas are home to Bendire's thrasher, California leaf-nosed bat, California McCoy snail, desert tortoise, hepatic tanager, Le Conte's thrasher, Mojave fringe-toed lizard, Nelson's bighorn sheep, pallid bat, and prairie falcon. The region's midland ironwood forest is the largest such ecosystem in the California desert.

The existing wilderness and the adjacent roadless land together comprise one of the largest remaining wild areas in southeastern California. Four mountain ranges, dunes, gigantic washes, large bajadas and other landforms come together in the region and help explain its diverse wildlife and plant habitat. These two areas should be excluded from the possibility of development.

Volcanic Tablelands Proposed Wilderness. The Volcanic Tablelands rise several hundred feet above the floor of the Owens Valley. The landscape is rugged and is comprised of hard volcanic tuff, which is highly uneven in its topography. The Volcanic Tablelands also contain extensive cultural resources including village sites, renowned petroglyphs and other archaeological resources. There are four BLM wilderness study areas (WSAs) on the Volcanic Tablelands (Fish Slough, Volcanic Tableland, Chidago Canyon and Casa Diablo), and the Citizens' Wilderness Proposal acreage for this area abuts all but Volcanic Tablelands as is shown at left. Not only does the region contain superlative resources, the variance lands identified are unfit for siting of large-scale solar development projects due to their topography and also their small size (77 acres). For these reasons, the lands should be excluded from consideration for variance applications. Remaining non-citizens' wilderness inventory lands in the vicinity of the Volcanic Tablelands should also be excluded for the same reasons.



Thank you for your comment, Leslie Barrett.

The comment tracking number that has been assigned to your comment is SEDDsupp20107.

Comment Date: January 27, 2012 10:55:56AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20107

First Name: Leslie
Middle Initial: J
Last Name: Barrett
Organization: Celtic Energy Corporation
Address: 1507 Seventh Street, Suite 540
Address 2:
Address 3:
City: Santa Monica
State: CA
Zip: 90401
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: PEIS Variance Request.pdf

Comment Submitted:

CELTIC ENERGY CORPORATION

1507 SEVENTH STREET, SUITE 540
SANTA MONICA, CA 90401

January 26, 2012

Solar Energy Draft PEIS
Argonne National Laboratory
9700 South Cass Avenue
EVS/240
Argonne, IL 60439

Comments on the Supplement to the Draft Solar PEIS

Dear Agencies:

Celtic Energy Corporation ("CEC") is a developer of renewable solar and wind energy projects. CEC and its partners currently have over 12 utility-scale renewable energy projects in three four western states with over 2,000 MW under development. In California, this development includes four major wind energy projects on Bureau of Land Management ("BLM") managed lands. California represents a strategic and important focus for CEC's development portfolio.

CEC also supports the efforts of the Department of Energy ("DOE"), the BLM and all the co-operating agencies in supporting the goal for the responsible development of renewable energy in the western United States. CEC shares this objective through sensible siting and conscientious development.

When reviewing any development proposal, CEC takes great care in identifying and analyzing prospective site characteristics. CEC evaluates its compatibility with surrounding land uses and whether residual impacts to the environment are minimized. After much detailed analysis, CEC believes that it has found such a potential solar development site. This site is unique in that it retains excellent solar resources, has likely mitigatible environmental impacts, is on land largely previous disturbed, is adjacent to transmission rights-of-way, substations and other solar developments, and has little other apparent public use.

We have reviewed the proposed Solar Development Area Maps and find that this excellent potential solar development site has not yet been specifically identified. The site is; however,

partially within areas identified as a proposed Variance area. The characteristics of the proposed solar development site are as follows:

- Project Name – Mojave Diamonds
- Land Owner – United States Department of the Interior, managed by the BLM
- Acreage – 6000 acres approx.
- Location – County of Kern, California (10 miles north of the community of Mojave)
- Address – West of State Route 14 between Randsburg Cutoff and Pine Tree Canyon
- Sections – T31S R36E, Sec. 24, 26 and 34; T31S R361/2E, Sec. 12, 13, 24, 25 and 36; T32S R35E, Sec. 24 and 26n2; and T32S R36E, Sec. 4, 8, 10e2, 12sw, 14ne, 18 and 22w2nw,swnw,news,nese
- APN's – Various
- Map – See enclosed

CEC appreciates that given the project acreage, this site may not be suitable as an independent Solar Energy Zone; however, we believe that portion of the proposed site currently designated as a variance area should be extended to the whole site.

Additional supporting factors include:

- The surrounding area is a hub for existing and permitted solar and wind electricity generation
    - Los Angeles Department of Water & Power ("LADWP") Barren Ridge Substation is at the northern boundary
    - Southern California Edison ("SCE") recently constructed Windhub Substation and proposed Highwind Substation are within seven miles of the project boundary
    - LADWP's proposed 230kV Transmission Line crosses the Mojave Diamonds Project site boundary (anticipated construction date of 2014)
    - LADWP's existing 230kV Transmission Line is proposed to be upgraded through the Mojave Diamonds project site
    - BLM Classification – Limited with Type II Application accepted

- There are numerous other major solar projects planned on adjacent lands
    - 100MW Cal City Solar, east of Mojave Diamonds Project site
    - 96MW Barren Ridge Solar, northeast of Mojave Diamonds Project site
    - 18MW Nautilus Solar Energy, Cantil Site, northeast of Mojave Diamonds Project
    - 100MW RE Distributed Project, adjacent easterly.
    - 38MW Ridge Rider Solar, northeast of Mojave Diamonds Project site

- In order to accommodate the flexibility described in the program objectives, the modified program alternative allows for utility-scale development in variance areas outside of the Solar Energy Zones and exclusion areas in accordance with a proposed variance ordinance. As the draft Solar PEIS document indicates, there are twenty-nine categories of lands that would be excluded from solar development. None of these categories are found at the proposed Mojave Diamonds Solar Project site. Moreover, the site is:
    - Project to accommodate a PV Array system of approximately 200MW total.
    - Site is not within the BLM-administered lands considered off-limits to development. Rather the site has been serialized by BLM as CACA052842
    - Lands have a slight southeast slope of approximately 3%
    - Solar isolation levels are greater than 7.0 kWh/m2/day
    - The Mojave Diamonds site is not in or adjacent to designated critical habitat, special management areas, wilderness study areas or ACECs
    - Preliminary biological assessments indicates that the site has no apparent critical habitat for any threatened or endangered species
    - The site is not a right-of-way exclusion areas or avoidance area
    - The site is not a special recreational management area or other special use area

According to the map published by the Argonne National Laboratory, dated October 2011, titled "BLM-Administered Lands in California Available for Application for Solar Energy ROW Authorizations under the Modified BLM Alternatives Considered in the Supplement", the Mojave Diamonds Project site appears only partially to have been included in Lands Available for Application – Modified Program Alternative (Variance Areas). For all the reasons stated above, including that the project application has already been accepted by the BLM, CEC believes the proposed PEIS can be enhanced with the inclusion of this Mojave Diamonds Project site.

We appreciate the opportunity to comment of the proposed Solar PEIS and are available at any time to discuss further the recommendations included in this transmittal. Should you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Leslie J. Barrett

Leslie John Barrett, PE, MBA, Esq.
President

Celtic Energy Corporation
1507 Seventh Street, #540
Santa Monica, CA 90401

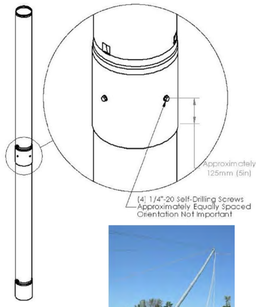
Location Map

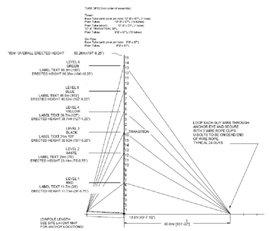
Legend

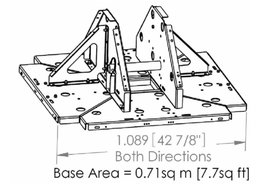
- Met Tower
- Project Boundary
- 250' LADWP Easment
- Aqueduct Buffer 150FT
- North America Railroads
- LADWP Barren Ridge NEW 230Kv
- Kern Roads
- Aqueduct
- Sections
- Townships

NOTES:

1. Wind forces and allowable member loads are calculated according to TIA/EIA standards.
2. Wind speeds are fastest mile wind velocity per EIA-222-F.
3. MES is non linear material mode in Algor FEA software and elastic analysis in SAP Software have been used to determine member forces an all the other loads.
4. Foundation has been analysed in Algor FEA software and any necessary anchor bolts, ground anchors and stakes.







Base Area = 0.71sq m [7.7sq ft]

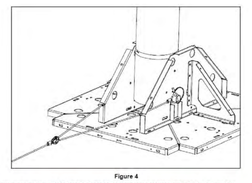
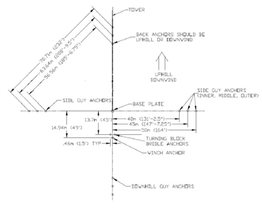


Figure 4

Drive ground rods through the baseplate holes so they can provide additional anchoring for the baseplate.



MT	N	W	N1	W1
MT1	35° 13' 8.831"	118° 4' 7.114"	35.219119610	-118.06864288
MT2	35° 8' 4.151" N	118° 10' 35.121	35.134486424	-118.17642258

Mojave Diamonds Project

Project Site Plan

CELTIC ENERGY CORPORATION

Celtic Energy Corporation
1507 7th Street, #540
Santa Monica, CA 90401

Tel. 800-590-8839
relations@windnrginc.com
windnrginc.com

Date: 10/11/2011
Serial Number
CACA 052842

BLM Ridgecrest Field Office

Project #12349
Drawn By: NRG Consulting Engineers

Thank you for your comment, Nada Culver.

The comment tracking number that has been assigned to your comment is SEDDsupp20108.

Comment Date: January 27, 2012 11:00:55AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20108

First Name: Nada
Middle Initial:
Last Name: Culver
Organization: The Wilderness Society
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Address 2:
Address 3:
City: Denver
State: CO
Zip: 80202
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: TWS Comments on Supplement to Solar PEIS - 2nd letter.pdf

Comment Submitted:

One of 2 letters TWS will be submitting today is attached.

THE WILDERNESS SOCIETY

January 27, 2012

Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue
EVS/240
Argonne, IL 60439

Re: Comments on Supplement to Draft Solar PEIS

To Whom It May Concern:

Please accept these comments on the Supplement to the Draft Solar Programmatic Environmental Impact Statement (PEIS). We appreciate the Bureau of Land Management providing further information and an opportunity for public comment. This letter is submitted in addition to the letter that The Wilderness Society is submitting with other organizations, in order to highlight a number of important issues that merited further discussion.

BLM should refine the proposed process for designating new SEZs in the Final PEIS.

We generally support the new SEZ identification process proposed in the Appendix D to the Supplement and recommend that it be strengthened in a few key areas to ensure that new SEZs are truly needed and are suitable for designation.

Key recommended changes:

- The Final PEIS should specify that petitions for new SEZs solely based on supporting single solar ROW applications will be denied – individual applications outside of zones should be handled through the variance process, and a developer proposing a single project should not justify designating a new SEZ.
- The Final PEIS should include, as part of the technical and economic feasibility criteria, consideration of planned or potential power plant retirements and subsequent changes to transmission access.
- The BLM should add the screening criteria recommended in [section XX of the group comment letter] and in the state-specific comments submitted separately to the list of screening criteria for new SEZs that will be incorporated into the Final PEIS.
- Among additional factors to be considered for new SEZs identified in the Supplement, the BLM should include opportunities for co-location of energy

development, such as co-location of solar development with wind or oil and gas projects, in the Final PEIS.

- While the appearance of exclusion areas within new SEZs can make sense in some situations (such as a few isolated wetlands within a very large SEZ), the BLM should take into consideration the fact that while these areas will be excluded from development, their productivity and health may be severely compromised if they are surrounded by solar development. For this reason, every effort should be made to minimize the designation of SEZs with significant numbers and/or acreage of exclusion areas within them.

The Final PEIS should set out additional specific incentives for development in SEZs.

The Modified Solar Energy Development Program Alternative will not limit development to zones, so it is important that BLM provide incentives and reduce disincentives for locating projects in SEZs. We support the incentives set out in Section 2.2.2.2.3 of the Supplement, including faster permitting with appropriate tiering of NEPA analysis, regional mitigation plans, transmission analysis, economic benefits, maintaining BLM's Renewable Energy Coordination Offices and teams, and incentives to transmission developers. We recommend that the Final PEIS detail the following **additional incentives**:

- Applications in SEZs will be given priority for agency resources including for processing;
- Applications for development outside of SEZs will be subject to a surcharge (of up to 50% for pending applications) on the per acre rental fee; and
- Applications in SEZs will be processed as Category 5 rights-of-way (master agreements), which allows more flexibility on cost-sharing between the application and BLM, while applications outside of SEZs will be processed as Category 6 right-of-way grants.

In addition, the Supplement now sets out a detailed approach to processing pending applications, which pertains to applications submitted before the date of publication for the Supplement for applications outside SEZs, but only pertains to applications submitted before June 30, 2009, for applications within SEZs. This differential treatment could be seen as a disincentive to applicants in zones and should be changed.

DOE should strengthen the preferred alternative.

We support DOE's preferred alternative, especially with the addition of more detailed information on the proposed programmatic guidance, which identifies general mitigation measures (for specific resources and for prioritizing disturbed lands and avoiding sensitive lands) and areas to avoid impacts. Supplement, pp. 3-1 – 3-7. We recommend specific improvements below.

Key recommended changes:

- DOE's programmatic environmental guidance in the Final PEIS should identify *excluded* categories of lands and explicitly incorporate the exclusion areas set out by BLM.
- DOE's guidance continues to reference streamlining environmental review but does not define what this means. In our comments on the Draft PEIS, we noted that DOE had not explained this term. We reiterate the importance of the Final PEIS stating that DOE will conduct all necessary environmental reviews associated with individual projects, which is not addressed in the Draft PEIS or the Supplement.
- The Final PEIS should set out programmatic mitigation measures to ensure that they are more than just "considerations." DOE's program can adopt the measures developed by the BLM and could also include additional incentives for siting in best locations, such as already-disturbed lands.

Specific guidance is needed on solar energy development – set out in TWS letter of August 26, 2011.

On August 26, 2011, The Wilderness Society provided specific recommendations for additional interim guidance to be issued prior to release of the Supplement to the solar energy review, which would ultimately form an integral part of the BLM's solar energy program. We noted that this guidance should also be incorporated into the Final PEIS and, as recommended in the BLM's response, we are resubmitting and incorporating by reference our detailed recommendations on specific guidance that should be set out in the Final EIS. Areas of guidance that are not currently addressed in the Supplement are:

- Targeted guidance on use of off-site mitigation and compensation;
- More specific NEPA requirements, such as release of a preliminary range of alternatives, defining a reasonable range of alternatives, and describing the scope of cumulative impacts analysis; and
- Onsite use of natural gas to support solar energy development.[1]

Criteria for addressing pending applications should be strengthened to better support the BLM's stated goal to facilitate environmentally responsible solar development, primarily in zones.

Section 1.7.2 of the Supplement states that the BLM will continue to process pending applications and defines "pending applications" as those on file prior to issuance of the Supplement, except for those in SEZs, which are only considered "pending" if submitted prior to June 30, 2009. We support BLM's acknowledgment that it has broad authority under FLPMA to reject pending solar applications prior to completing the NEPA process

[1] Our original recommendations also included direction on a pilot program for competitive leasing; however, in light of the recently-issued Advance Notice of Proposed Rulemaking Regarding a Competitive Process for Leasing Public Lands for Solar and Wind Energy Development, we will provide our comments and recommendations directly through that formal process.

and prior to issuance of the Solar PEIS ROD. However, in order to better support the agency's goals, we recommend the following specific improvements.

Key recommended changes:

- BLM should focus on eliminating unacceptable project applications from its processing queue without delay. With few exceptions, areas identified as exclusion or high conflict areas, as defined by IM 2011-061, represent lands with important environmental, cultural, or recreational values. BLM should quickly identify which project applications are within areas that would be excluded under the Final EIS or in high conflict areas and reject those with documented conflicts. The agency should also apply diligence requirements set out in IM 2011-060 to these applications.
- Pending applications within SEZs should be given the opportunity to choose to be analyzed under the program set out in the Solar PEIS ROD.
- Pending applications outside SEZs that are not on excluded or high conflict lands should also be given the opportunity to choose to submit a new application within a SEZ.
- Pending applications should only include those submitted prior to June 30, 2009.

Thank you for your consideration of our comments.

Very truly yours,

Nada Culver
Senior Director, Agency Policy & Planning
1660 Wynkoop Street
Denver, CO 80202
(303)-650-5818 Ext. 117

ATTACHMENT

THE WILDERNESS SOCIETY

August 26, 2011

Via electronic mail and U.S. Mail

Director Robert Abbey
Bureau of Land Management
U.S. Department of the Interior
1849 C St NW
Washington, DC 20240

Re: Needed guidance for development of solar energy on BLM lands

Director Abbey:

We are writing to commend you for the continued evolution of your agency's program to administer solar energy resources on the public lands and to ask for additional action in advance of a final programmatic environmental impact statement and record of decision. We recognize you inherited an agency facing a significant backlog of renewable energy applications as the result of a decade of inattention and inactivity. The substantial progress made toward rationalizing development of these critical clean energy resources is due principally to your "smart from the start" vision, your leadership, and your strong commitment to building upon lessons learned.

Nowhere is this more evident than in the ongoing effort to finalize the programmatic environmental impact statement for solar energy. The Bureau has made a strong commitment to compile additional information on the proposed Solar Energy Zones originally identified by the agency as priority areas for solar development, as well as key policy issues such as criteria for identifying new Solar Energy Zones and additional details regarding how the zone-based program will operate going forward. By striking the right balance between protecting wildlife and wild lands and facilitating faster and cheaper development, this program is the way forward to create green jobs and clean power for years into the future.

However, while this additional effort is underway there is a continuing need to provide guidance for the benefit of field staff, applicants, and other stakeholders. We offer the following recommendations for additional interim guidance to be issued prior to release of the supplement to the solar energy review. As a key part of the BLM's solar energy program, we also expect this guidance to be incorporated into the final programmatic environmental impact statement.

1. Targeted guidance on use of off-site mitigation and compensation.

The BLM is in need of tailored guidance on the use of off-site mitigation in the context of solar energy development, which would acknowledge the range of resources and uses to be addressed, as well as guide the agency in developing and requiring use of this important tool.

Industrial-scale solar energy development is currently occurring on the public lands using multi-decade rights of way and is likely to prevent all or most other uses of sites for at least the term of those ROWs, if not beyond, due to modifications sites during construction and operations. Instruction Memorandum (IM) 2011-003 prescribes 30-year terms. Off-site mitigation can – and should – provide a way to compensate for the loss of use of the affected public lands. In fact, off-site mitigation is already being used to address impacts from solar energy projects to habitat for both plants and wildlife in California. The Draft Solar PEIS only specifically contemplates use of off-site mitigation for visual resources, cultural resources and wetlands. The application to wetlands is based on existing "no net loss" policy. Draft PEIS, p. 5-65. With respect to loss of visual resources, the Draft states:

> In addition to mitigation measures that directly reduce the visual resource impacts of solar energy and associated facilities, the off-site mitigation of visual impacts may be an option in some situations. Off-site mitigation should be considered in situations where nonconforming proposed actions may lead to changing the VRM Class objectives through an RMP amendment. Unavoidable visual impacts may then be mitigated by a correction or remediation of a nonconforming existing condition resulting from a different proposed action located within the same viewshed for impacts of approximately equal magnitude, and within the same or a more protective VRM class. The off-site mitigation serves as a means to offset and recover the loss of visual landscape integrity. **For example, off-site mitigation could include reclaiming unnecessary roads, removing abandoned buildings, reclaiming abandoned mine sites, putting utility lines underground, rehabilitating and revegetating existing erosion or disturbed areas, or establishing scenic conservation easements. In situations where off-site mitigation opportunities are absent within the same viewshed, then different viewsheds that need mitigation of visual impacts because they could affect highly sensitive visual resources (e.g., along National Scenic and Historic Trails, Wild and Scenic River corridors, Scenic or Backcountry Byways, etc.) may be considered.** BLM policy guidance on off-site mitigation procedures is contained in BLM Instruction Memorandum No. 2008-204, Offsite Mitigation (BLM 2008f).

Draft PEIS, Section 5.12.3.7 Use of Off-Site Mitigation Measures for Visual Resources, pp. 5-203 – 5-204 (emphasis added).

The Draft PEIS also references the use of offsite mitigation for impacts to cultural resources, without detailed discussion. Draft PEIS, p. 5-220. However, despite the obvious and ongoing need for use of off-site mitigation to address the impacts of large-scale solar energy development, the Draft PEIS does not address the issue in detail. There is no discussion of the many other resources that will be affected or lost, and should be subject to off-site, compensatory

mitigation; and there is no detailed direction as to how needed off-site mitigation should be developed and applied.

Further, the agency's current guidance on offsite mitigation (IM 2008-204 "Offsite Mitigation ") does not specifically address solar development or distinguish among the types of "large development projects" where offsite mitigation might be appropriate, which are identified as:

- Oil, gas, or geothermal fields, or individual wells that will make up a large field and associated rights-of-way;
- Major road, electrical, or pipeline rights-of-way projects;
- Wind farms or solar arrays;
- Municipal water reservoirs;
- Mining operations; and
- Recreation and Public Purposes Act leases or patents in important habitat.

In light of the long-term and virtually exclusive use of large blocks of the public lands required for solar energy development, clearer direction is needed regarding the use of off-site mitigation.

The BLM could meet this need for additional direction on the use of off-site mitigation for solar energy development by supplementing IM 2005-069 with additional guidance focused on the use of offsite mitigation for solar energy projects that includes the following elements and statements:

- Recognition that solar development is likely to prevent all or most other uses of sites for decades at a time and, therefore, it is expected that offsite mitigation will be needed to address impacts to a variety of resources and uses.
- Clarification of the agency's authority to require offsite mitigation (even if the applicant does not propose its use).
- Direction that resources and uses that should be considered for off-site mitigation (including compensatory mitigation) include, but are not limited to habitat for wildlife or plants, water, recreation, scenic values, cultural resources, and ecosystem function[1].
- Off-site mitigation requirements will be developed for each project with input from the applicant and state wildlife agencies, as well as other experts.
- NEPA analyses for projects will incorporate off-site mitigation, including a range of alternatives.
- In order to rely upon off-site mitigation to reduce impacts, the agency must[2]:
    - Have authority to implement the measures,
    - Have a reasonable expectation that it will have the resources needed to implement and monitor the mitigation measures, and
    - Have a reasonably, scientifically-based expectation that the mitigation measures will effectively avoid or reduce impacts.

[1] In California, offsite mitigation is being used to address habitat loss. While the California Fish and Game Department has required some of this mitigation, the BLM's California Desert Conservation Area Plan also specifies mitigation ratios for loss of certain categories of lands, including critical habitat.
[2] Consistent with Council on Environmental Quality Memorandum of January 14, 2011.

2. Baseline terms and conditions for ROWs that address solar energy and set out the BLM's authority to change and supplement terms.

As indicated, solar energy development is currently permitted and managed through a right-of-way grant that sets out terms and conditions, using the agency's standard form (SF299). The SF299 is used for a wide variety of uses, but historically has not been used to permit actions that become an exclusive use for decades, such as industrial-scale energy development. While the BLM can adapt the ROW form for individual projects, there are specific terms that should apply to all solar energy projects. A standard set of terms and conditions that applies to the construction, operation and reclamation of solar energy projects would ensure that the information gathered and lessons learned from the BLM's recent processing of numerous applications is used to improve all projects. These terms and conditions should include some of the innovative and carefully tailored terms developed as part of protest resolution discussions in California, such as:

- Provision for designating "unavailable" areas within rights-of-way to better manage a contiguous area and protect important resources;
- Requirement that any compensatory lands acquired as part of mitigation will be subject to permanent protection via fee acquisition and transfer for permanent management and conservation;
- Commitment not to assert or otherwise claim any water rights, surface or groundwater, beyond the use permitted under the specific ROW terms;
- Provision for the BLM to require modified or new monitoring as new information is developed or concerns identified and to incorporate such results into site management activities;
- Requirement to make monitoring results available to the public;
- Notice and commitment that substantial changes in the proposed and approved technology will require additional NEPA review before construction and operation can proceed.

These terms should also address and discourage speculative permit applications. The BLM should include in its standard terms a clear statement that assignment or transfer will not permitted in the first three years after authorization is given without a demonstration of need and technical and economic viability of the party interested in acquiring the approved ROW grant before approving reassignment or transfer. Additionally, BLM should provide for review and application of the same criteria in the event of a change in ownership of the company holding the grant and assert its authority to cancel a grant if viability is in question. Finally, BLM should require construction activity to commence within 12 months of a grant except under extraordinary circumstances with BLM's explicit approval.

The BLM should either create a new right-of-way grant application form for solar energy development or create a supplement to the SF299 specific to solar energy development. In addition to setting out specific terms for management of projects, each ROW should include terms to protect the BLM's ability to reassess and impose additional protective measures based on new information or policies, including but not limited to newly-discovered listed species or monitoring data. The BLM should specifically preserve its prerogative to apply new policies and new program requirements, such as diligence requirements, zoning/prioritization decisions, best

management practices and bonding requirements, many of which should be developed in detail through the Solar PEIS and will likely continue to be refined[3].

The agency already makes use of similar terms in other documents providing for development on public lands. For example, oil and gas leases include stipulations to advise lessees that they will be subject to new terms in similar situations. IM 2010-117 (Oil and Gas Leasing Reform) sets forth in Appendix I a comparable approach requiring all leases to contain stipulations preserving the Bureau's right to impose new restrictions upon discovery of special status species or cultural and historic resources.

3. More detailed guidance on inventory of cultural and historic resources and consultation.

Preserving our shared cultural history is an important part of the BLM's mission, cited in both the Federal Land Policy and Management Act (FLPMA) and the National Historic Preservation Act. BLM is legally obligated to consult with Tribal entities and other consulting parties, including State Historic Preservation Officers, local governments, and other interested individuals and organizations, at the earliest feasible opportunity. In addition, BLM is required to identify sites that are eligible for listing or are listed on the National Register of Historic Places, and take develop measures to avoid or mitigate damage to cultural resources and historic properties. Unsuccessful efforts to engage and respond to the concerns of Tribal entities and other interested, consulting parties have led to not only publicized resentment but also legal actions and even an injunction against construction of an approved solar energy project. While the agency is working on a programmatic agreement (PA) for solar energy, a structured approach to not only compliance but also proactive outreach will better position proposed projects for success and can build on the provisions of the PA.

The BLM can issue new guidance for early, timely, personalized, and in-person consultation and outreach to Tribes and other consulting parties. This guidance can apply as part of finalizing Solar Energy Zones, as part of prioritizing areas for development within zones, throughout the processing of applications, and during construction and operation of projects. Key elements of the guidance would be:

- At each step, consultation and outreach should incorporate:
  - Sufficient time for response from Tribal representatives,
  - In-person conference to discuss concerns and try to reach resolution as early as
  - possible,
  - Formal response from agency staff demonstrating efforts to accommodate
  - Tribal concerns, and
  - Identification and evaluation of historic properties.
- Identification and evaluation may be conducted in progressive stages of detail, but should be completed prior to the application stage and be conducted at each stage as soon as there is enough information to make it feasible to do so.
- All parties to PAs should be given opportunities to provide input at all stages identified above.

[3] The agency already uses lease stipulations with similar language for new information, determinations and policy in oil and gas leases, which can provide a reference.

- PAs for the Solar Energy PEIS and for other zones, priority areas or individual projects should follow the steps outlined above for consultation, identification and evaluation, as well as addressing Tribal concerns and potential impacts to cultural and historical resources.

4. More specific NEPA requirements –

The National Environmental Policy Act (NEPA) dictates that BLM take a "hard look" at the environmental consequences of a proposed action and the requisite environmental analysis "must be appropriate to the action in question."[4] In order to take the "hard look" required by NEPA, BLM is required to assess impacts and effects that include: "ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative." 40 C.F.R. § 1508.8. NEPA regulations define "cumulative impact" as:

> the impact on the environment which results from the incremental impact of the action when **added to other past, present, and reasonably foreseeable future actions** regardless of what agency (Federal or non-Federal) or person undertakes such other actions. **Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.**

40 C.F.R. § 1508.7 (emphasis added). In the context of industrial-scale solar energy development, these impacts are wide-ranging and significant. Specific guidance for thorough analysis of projects will ensure impacts are identified early on and can be addressed through improvements or even rejection of projects. There are a number of key aspects of NEPA analysis of solar energy projects that should be addressed in new or amended policy guidance:

a. Preliminary range of alternatives is issued for public comment.

NEPA requires BLM to "[e]ncourage and facilitate public involvement in decisions which affect the quality of the human environment"; and notes that "public scrutiny" is "essential to implementing NEPA." 40 C.F.R. § 1500.1(b); § 1500.2(d). Releasing a range of preliminary alternatives for public comment, prior to finalizing and issuing a formal Draft EIS (or EA), would advance NEPA's twin goals of providing meaningful public participation in government decisions and ensuring government decisions affecting the quality of the environment are fully informed by all relevant information.

The BLM and other federal agencies already make use of this tool. Numerous BLM offices have used preliminary alternatives as a way to expand opportunities for public comment on resource management plans (RMPs). For instance, the Arizona Strip BLM Office provided preliminary management alternatives, giving the public a chance to submit comments and giving the BLM valuable insight into their management approaches (available on-line at: http://governor.utah.gov/rdcc/Y2003/03-2902.pdf). The Las Cruces Field Office (New Mexico)

[4] *Metcalf v. Daley*, 214 F.3d 1135, 1151 (9th Cir. 2000); *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348 (1989).

also held workshops and solicited public comments on preliminary alternatives for the Tri-County RMP (see RMP Newsletter 3, available at http://www.blm.gov/nm/st/en/fo/Las_Cruces_District_Office/tricounty_rmp.html) and the Trackways National Monument (see press release, available at http://www.blm.gov/pgdata/etc/medialib/blm/nm/field_offices/las_cruces/las_cruces_planning/trackways_rmp.Par.97147.File.dat/NewsRelease_ptnm_workshop9_2010.pdf, and preliminary alternatives highlights, available at http://www.blm.gov/pgdata/etc/medialib/blm/nm/field_offices/las_cruces/las_cruces_planning/trackways_rmp.Par.4873.File.dat/Issue_summaryV2_rgedit.pdf).

Requiring BLM field offices to provide a preliminary range of alternatives for comment as part of NEPA analysis for solar energy projects would allow the agency to identify key issues or places or approaches to a project that are not being considered but could lead to serious opposition, or improvements in a project, or even substantial legal flaws in the analysis.

b. Reasonable range of alternatives is analyzed.

NEPA requires the BLM to consider alternatives to the proposed action.[5] This requirement has been described as the "heart" and "linchpin" of the environmental review by the courts and the Council on Environmental Quality ("CEQ"), respectively.[6] Agencies must "rigorously explore" all reasonable alternatives to the proposed action and "[d]evote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits." 40 C.F.R. § 1502.14(a). Further, in defining what is a "reasonable" range of alternatives, NEPA requires consideration of alternatives "that are practical or feasible" and not just "whether the proponent or applicant likes or is itself capable of carrying out a particular alternative"; in fact, "[a]n alternative that is outside the legal jurisdiction of the lead agency must still be analyzed in the EIS if it is reasonable."[7] The foregoing principles are equally applicable to an EA.

IM 2011-059 provides initial guidance on the range of alternatives, but should contain more specificity regarding reasonableness and should also be revised to acknowledge the important information that can be gained from analyzing alternatives in different locations. Consequently, in the context of a solar energy project, BLM guidance should clarify that a reasonable range of alternatives includes the proposed alternative, a no action alternative, and at least two additional alternatives that consider:

- ,
- alternate locations beyond the specific boundaries of proposed rights-of way, including private land alternatives,
- smaller "footprint" or size than the proposed action, which could reduce environmental impacts,

[5] 42 U.S.C. § 4332(2)(C)(iii); *Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1228-1229 (9th Cir. 1988).
[6] *See Monroe County Conservation Council v. Volpe*, 472 F.2d 693, 697-698 (2nd Cir. 1972); 40 C.F.R. § 1502.14.
[7] Council on Environmental Quality, Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, Questions 2A and 2B, available at http://ceq.hss.doe.gov/nepa/regs/40/40p3.htm; 40 C.F.R. §§ 1502.14, 1506.2(d).

- different technology from that in the proposed action, which may be more efficient or reduce environmental impacts (such as using less water), if feasible, and
- a range of reasonable foreseeable development for the proposal and adjacent lands, including consideration of non-project alternative.

c. Cumulative impact analysis should take into account connected actions and additional projects affecting resources in the area.

To satisfy NEPA's hard look requirement, the cumulative impacts assessment must do two things: First, BLM must catalogue the past, present, and reasonably foreseeable projects in the area that might impact the environment. [8] Second, BLM must analyze these impacts in light of the proposed action.[9] If BLM determines that certain actions are not relevant to the cumulative impacts analysis, it must "demonstrat[e] the scientific basis for this assertion."[10] A failure to include a cumulative impact analysis of actions within a larger region will render NEPA analysis insufficient.[11] While the treatment of this issue has improved with recent EISs, more work is needed.

For solar energy projects, guidance should define the needed cumulative impact analysis to ensure sufficient review of all likely connected actions (such as transmission associated with a proposed project) and additional projects planned for the area, all of which can have compounding effects and significant effects on natural resources. In particular, it is clear that other proposed solar projects and their associated transmission in the California Desert are likely to cause significant impacts on habitat for the desert tortoise , which should affect the size, design, technology, and mitigation measures that would be required to responsibly permit additional development of a new project in tortoise habitat. To date, BLM EISs have conceded these effects but have not analyzed the impacts of such development on potential tortoise recovery or whether the cumulative impacts can in fact be mitigated. Completing a more thorough analysis of cumulative impacts would enable the agency to determine mitigation that is needed on a landscape level, such as protecting migration corridors, as well as more site-specific adjustments to project boundaries or technology to provide added protection for wildlife, plants or water that are being stressed from a variety of uses.

5. Dealing with pending applications

In advance of a final PEIS and ROD, BLM has the opportunity to resolve confusion surrounding which applications will be treated under which set of rules with a clear policy statement is how the Bureau will address pending applications. Specific recommendations were offered by a coalition of developers and conservationists, and should form the basis for new guidance to be issued immediately.

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[8] *Muckleshoot Indian Tribe v. U.S. Forest Service*, 177 F.3d 800, 809–10 (9th Cir. 1999).
[9] *Id.*
[10] *Sierra Club v. Bosworth*, 199 F.Supp.2d 971, 983 (N.D. Ca. 2002).
[11] *See, e.g., Kern v. U.S. Bureau of Land Management*, 284 F.3d 1062, 1078 (9th Cir. 2002) (analysis of root fungus on cedar timber sales was necessary for an entire area).

New guidance should spell out which applications will be subject to the land use and other requirements to be finalized in the ROD. In February 2011, the Bureau issued significant new policy guidance sending a clear indication to new applicants that, in combination with the Draft PEIS, development will be confined to areas of low resource conflict. Accordingly, any new applications filed on or after March 1, 2011, should be governed by the terms of the Solar PEIS ROD when finalized. This rule should not apply to boundary adjustments to move an existing project application to a nearby area in order to avoid environmental or cultural conflicts, even if this relocation would technically require a "new" application.

To improve the processing of other pending applications submitted before March 1, 2011, the existing guidance for the administration of solar energy development on public lands must be improved and revised as follows:

- The BLM should establish a new processing fee structure for the costs of "holding" a location, set at a level sufficient to dampen speculation and to acknowledge the acreage that may be subject to restriction while BLM processes complicated applications for utility-scale solar projects. Neither BLM's current ROW regulations and guidance nor BLM's guidance on processing solar energy applications adequately addresses this risk. All applicants would be required to pay these processing fees in full into escrow before application processing begins.
- The BLM should clearly define all POD requirements and enforcement mechanisms.
- The Bureau should revise the screening criteria laid out in IM 2011-061 with the screens proposed by industry and conservation community partners in December 2010,[12] respecting the additional accommodations provided to the National Park Service. The Bureau should coordinate with the Department of Energy, Treasury, and other federal agencies to apply screens within their expertise to ensure that limited public resources are focused on only the most viable applications. The Secretary of the Interior is not the only person who is concerned about the "flipping" of ROW authorizations that has occurred to date.
- Pending applications should then be subject to environmental screening as follows:
    - Early outreach prior to NOI (as provided under IM 2011-061).
    - Project Rating according to environmental criteria, based on available data, to group pending applications by likelihood of conflict as described in screens (high, medium and low) and applicants notified.
    - All pending applications, regardless of when filed, that are determined by the BLM to be in high conflict areas following consultation with the applicant and stakeholders, should be rejected.

6. Leasing pilot program

Solar development is administered using a right-of-way application under FLPMA. This legal instrument is a poor fit for commercial energy development. ROW relates to the *use of lands* not the *development of a resource* on or emanating from lands. The placement of facilities *on*, or other physical use *of*, federal lands is very different from the commercial development of a resource. ROW authorizations under FLPMA are intended for and better suited to limited uses of

[12] *See California Desert Renewable Energy Working Group letter to Director Abbey*, December 22, 2010.

lands under a multiple-use framework, than to long-term, exclusive commercial resource development operations.

For other energy resources, leases have proven more appropriate than ROW authorizations for resource development in collecting a fair return to taxpayers and ensuring the long-term certainty required by developers and the public alike.

The Bureau should take immediate steps to prepare for a transition to leasing solar energy resources on public lands. It is clear that the management of these fuel sources benefits from leasing systems designed to deal with long-term, commercial operations. But the Bureau should carefully evaluate the elements of a leasing system most appropriate for a young industry like solar. To do so, the Bureau should initiate a pilot demonstration effort evaluating methods of competitive offering in the case of overlapping applications in solar energy zones, with the purpose of experimenting with ways to resolve competitive interest to the maximum benefit of government and taxpayers.

7. Standardized and mandatory policies and design features

The Draft Solar PEIS includes a set of "Current and Proposed Bureau of Land Management Solar Energy Development Policies and Design Features" as Appendix A, which may be incorporated into the agency's Solar Energy Program. A key aspect of incorporating these practices into the program and into all future projects will be creating a version of the list that can be issued as soon as possible and made mandatory (where applicable) to all projects.

BLM and other federal agencies have developed an effective way to make a "menu" of terms and mitigation measures required to all projects as they are applicable. The Record of Decision on the PEIS for the West-wide Energy Corridors includes Appendix B – Interagency Operating Procedures (available at http://corridoreis.anl.gov/documents/docs/Energy_Corridors_final_signed_ROD_1_14_2009.pdf), which applies as follows:

> These Interagency Operating Procedures (IOPs) are adopted as part of the plan amendments and are mandatory, as appropriate, for projects proposed within the Section 368 corridors. Not all IOPs will be appropriate for all projects; those that apply to pipelines, for instance, are not appropriate to transmission lines. These IOPs are practicable means to avoid or minimize environmental harm from future project development that may occur within the designated corridors. The IOPs set forth below are not intended and should not be construed to alter applicable provisions of law or regulation or to reduce the protections afforded thereby to the resources addressed in the IOPs.

These IOPs address all aspects of project, including design, transportation, specific affected resources, construction, decommissioning, and consultation. In addition, the IOPs clarify where they may apply differently to different ecosystems.

A similar list of practices and procedures can be finalized and issued *immediately* to apply to all projects, and then updated and incorporated as part of finalizing the PEIS, as well. The BLM can and should make this list available immediately, without waiting for the Solar PEIS to be finalized.

As part of issuing a list of mandatory policies and design features, the BLM should also include an analysis of their effectiveness –in terms of evaluating the broader categories and their application in specified situation. In the Draft Solar PEIS, the BLM asserts that its "comprehensive set of mitigation requirements would ensure that impacts from solar energy development on BLM-administered lands would be mitigated to the fullest extent possible." Draft Solar PEIS, p. 6-104. However, in order to rely on these measures, the agency must provide data and analysis that demonstrate why the proposed policies and design features will "constitute an adequate buffer against the negative impacts that may result from the [proposed alternatives]."[13] Simply identifying mitigation measures, without analyzing the effectiveness of the measures, violates NEPA. Agencies must "analyze the mitigation measures in detail [and] explain how effective the measures would be . . . A mere listing of mitigation measures is insufficient to qualify as the reasoned discussion required by NEPA."[14] Thus, in addition to providing the scientific basis for adopting these policies and practices, the BLM must discuss why the selected mitigation measures are likely to be successful in the context of NEPA analysis for individual projects.

As part of our comments on the Draft Solar PEIS, we provided a compilation of best management practices for renewable energy siting and development drawn from scientific, peer-reviewed research prepared by Utah Clean Energy and several other conservation groups in the West (attached as Appendix VIII to those comments). We once again urge the BLM to carefully examine this document as part of producing a compendium of design features that are scientifically supported. IM 2011-003 references certain best management practices and applicable documents that are made available in different locations, but does not provide an easily accessible, comprehensive listing that is needed to make inclusion of these provisions in permits for individual projects practical, realistic, and likely.. Guidance providing such a listing and making it mandatory for all solar energy projects in applicable contexts should not be delayed.

8. <u>On-site use of natural gas especially with regard to hybrid plants</u>

Increasingly, developers are turning to hybrid generation options on private lands projects to bolster the variability of the solar resource. Pairing natural gas-fired generation with solar energy development can be a logical match, but the economic and environmental advantages of renewable energy generation (like solar) can be eclipsed if a distinction is not clearly drawn between solar development technologies that may require a minimal amount of natural gas and those that depend on a non-renewable fossil fuel as a chief generation resource.

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[13] *Nat'l Parks & Conservation Ass'n v. Babbitt*, 241 F.3d 722, 734 (9th Cir. 2001).

[14] *Nw. Indian Cemetery Protective Ass'n v. Peterson*, 764 F.2d 581, 588 (9th Cir. 1985), *rev'd on other grounds*, 485 U.S. 439 (1988).

Co-locating a solar facility with a large natural gas facility to gain an advantage for developing natural gas-fired electricity on public lands should be clearly addressed and discouraged. Guidance should be issued to address on-site use of natural gas or other non-renewable fuels used in the generation of electricity to firm solar and wind generation, and define what constitutes a renewable energy project.

We sincerely hope the BLM will not delay in issuing this critical guidance and appreciate your attention to these recommendations. As always, we are available and interesting in meeting with you to discuss these important matters further.

Very truly yours,

Nada Culver, Senior Counsel and Director
BLM Action Center
1660 Wynkoop Street, Suite 850
Denver, CO 80202
303-650-5818 Ext. 117

Chase Huntley
Director, Renewable Energy Policy
1615 M Street, NW
Washington, DC 20036
202-429-7431

Thank you for your comment, Claire Sears-Barker.

The comment tracking number that has been assigned to your comment is SEDDsupp20109.

Comment Date: January 27, 2012 11:11:18AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20109

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Attachment:

Comment Submitted:

Thank you for taking the effort to compile and go through all the comments and bring public meetings to us through-out this process.

I want to emphasize that at this point in our technological advances-and our increased dedication to conservation-the Government should be supporting the "Distributed Generation Modeling" to address our nations energy issues in a way that is compliant and complimentary to the word moniker "green". Please see "Solar Done Right" for more information, or google "Bill Powers". Every community has distinct renewable resources, but the sun shines almost everywhere.

Corporate use of public lands should be the LAST option to follow before utilizing already denigrated (preferably private) lands. Communities-within these developments-should have clear and dependable economic benefit.

In particular-developing SEZ's within the San Luis Valley-not only is planning on export that is not supported by transmission at this time-but is also not going to make substantial economic benefits to the tax structure of any of the communities.

With the proposed decrease in irrigation pumping of lands within the SLV, we have in our midst-already denigrated lands of higher acreages than those proposed in the SEZ studies, which would bring economic benefit under tax distributions-if not in long term employment....distributive modeling near point of use is a much "greener" option all the way around. Leave undeveloped land-undeveloped-please.

Thank you for listening.
Claire

Thank you for your comment, Laura Mauney.

The comment tracking number that has been assigned to your comment is SEDDsupp20002.

Comment Date: November 3, 2011 14:53:19PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20002

First Name: Laura
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Privacy Preference: Withhold address from public record
Attachment:

Comment Submitted:

I feel strongly that before any undeveloped public land is used for solar power sites, all public buildings in every setting should be targeted first, public office buildings, military facilities, schools, etc. Though I am sure there are engineering issues involved that could be avoided on a solar farm, using developed real estate for solar power sites will help prevent overuse of wilderness areas, shorten delivery distance for generated power, and provide immediate solar solutions to the actual structures involved, among other obvious benefits.

Thank you for your comment, Gary Baney.

The comment tracking number that has been assigned to your comment is SEDDsupp20003.

Comment Date: November 3, 2011 17:59:23PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20003

First Name: Gary
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Zip: [Withheld by requestor]
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Attachment:

Comment Submitted:

I applaud any carefully-considered installation of solar panels on government lands.

Thank you for your comment, William Branham.

The comment tracking number that has been assigned to your comment is SEDDsupp20004.

Comment Date: November 4, 2011 09:50:50AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20004

First Name: William
Middle Initial: A
Last Name: Branham
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City: VALDOSTA
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Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

21st Century Telecom, Inc. has created a “regional solar market transformation net-zero energy smart grid initiative” including DOE& DOD; to address market barriers within a USDA Enterprise Zone and Champion Community including SBA Hub Zones.” This initiative when connected with Smart-Grid nanoantennas technology. provides a paradigm-shift for cost-effective economic development with tremendous economic potential.
The Company has a unique “wireless, Internet and mobile television network concept including renewal energy, transportation, housing and manufacturing.” We are promoting a change in the way we design new communities using a renewal energy systems approach–with sustainable planning, net zero-energy homes, advanced vehicles, and innovative utility interconnections–which will significantly decrease energy use.

Thank you for your comment, Laura Mauney.

The comment tracking number that has been assigned to your comment is SEDDsupp20005.

Comment Date: November 4, 2011 10:55:13AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20005

First Name: Laura
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Country: [Withheld by requestor]
Privacy Preference: Withhold address from public record
Attachment:

Comment Submitted:

Comment #2 from me: I also feel strongly that BEFORE federal wilderness land is used for solar farms, the vast, vast amount of federal land used for government parking lots at all facilities could be utilized as space for solar power arrays. Three obvious advantages to this are: 1) Immediate delivery of solar power to adjoining buildings and shortened delivery of surplus power to the local utility; 2) Shade and weather protection for cars; 3) A resource for electric vehicle recharging. I've read articles about this on the DOE blog and elsewhere. Here is a link to one such article: http://green.blogs.nytimes.com/2010/07/06/the-parking-lot-as-solar-grove.

Thank you for your comment, Patrick Cannon.

The comment tracking number that has been assigned to your comment is SEDDsupp20006.

Comment Date: November 4, 2011 11:49:42AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20006

First Name: Patrick
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Attachment:

Comment Submitted:

I definitely think that we need to utilize public and federal lands to increase our renewable energy portfolio and to rid our country of protolium based fossil fuels. There are creative ways to achieve this that will satisfy many elements such as water storage, Solar energy production, Wind energy production as well as create asthetically pleasing areas for public useage. This can truely be a "Win - Win" situation!

Thank you for your comment, Paul Headley.

The comment tracking number that has been assigned to your comment is SEDDsupp20007.

Comment Date: November 14, 2011 13:36:52PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20007

First Name: Paul
Middle Initial: F
Last Name: Headley
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State: VA
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Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Don't spend public money to put solar projects on public lands which will benefit one company's bottom line or one group of citizens' electric bill but cost all taxpayers with increases to the national debt.

There is already one company that madoff with our public money by paying themselves obscene salaries before going bankrupt. We don't need others.

Thank you for your comment, HAROLD FOSTER.

The comment tracking number that has been assigned to your comment is SEDDsupp20008.

Comment Date: November 28, 2011 16:00:02PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20008

First Name: HAROLD
Middle Initial: J
Last Name: FOSTER
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State: CA
Zip: 92239
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Attachment:

Comment Submitted:

COMMENTS REGARDING SOLAR INSTALLATIONS LOCATED IN AND AROUND THE CHUKAWALLA VALLEY. SPECIFICALLY lAKE TAMARISK IN DESERT CENTER.

MY WIFE AND I LIVE IN THE LAKE TAMARISK RESORT AREA OF DESERT CENTER. IT IS OUR PERMANENT ADDRESS. WE BOUGHT OUR PROPERTY IN 2005 TO INSURE A RETIREMENT HOME. WE OWNED A HOME ON THE GOLF COURSE IN PALM DESERT. WE ARE BOTH REALTORS ASSOCIATED WITH WINDERMERE REAL ESTATE OF CHOACHELLA VALLEY. WE ARE NOT RETIRED BECAUSE WE CAN NOT AFFORD TO LIVE ON SOCIAL SECURITY. MUCH OF OUR NEST EGG WAS LOST IN THE BURSTING OF THE REAL ESTATE BUBBLE. WE HAVE SPENT THE BALLANCE ON LIVING DURING THIS INCREDIBLE RECESSION AS REALTORS DO NOT GET ANY UNEMPLOYEMENT BENEFITS AND WE HAD TOO MUCH TO QUALIFY FOR ANY OTHER BENEFITS. WE ARE BROKE NOW AND THEREFORE HAVE NO VOICE. HOWEVER I STILL HAVE AN OPINION.

I SUPPORT SOLAR AS A POLICY FOR OUR STATE AND OUR COUNTRY. CLEAN IS GOOD. FREE IS GOOD. NO FRACKING OR LEAKY PIPLINES IS ALSO GOOD. GLOBAL WARMING IS REAL AND ITS VERY BAD.

BEING BROKE WITH NO JOB IS BAD. ABANDONDED HOMES AND FORECLOSED PROPERTIES ARE REALLY UGLY FOR A COMMUNITY.

SINCE THE START OF CONSTRUCTION ALL OF LAKE TAMARISK PROPERTIES, ABANDONED AND FORECLOSED HAVE SOLD. THEY ARE NOW RENTED TO SOLAR PEOPLE AND AT LEAST THREE HOMES HAVE ATTRACTED SNOW BIRD BUYERS. THREE IS A LOT IN A COMMUNITY OF 28 HOMES. SNOWBIRDS ARE GREAT NEIGHBORS...THEY DON'T GROW POT OR COOK METH. THAT DOES HAPPEN MUCH TO OFTEN IN ABANDONED AND FORECLOSED PROPERTIES IN DESERT TOWNS TRHOUGH OUT CALIFORNIA.

I LOVE SOLAR FOR THAT REASON ALONE.

THE DESERT SUNLIGHT PROJECT WILL BE COMPLETED IN A COUPLE OF YEARS AND I HOPE THAT ANOTHER PROJECT WITHIN THE VALLEY GETS STARTED AT THAT TIME. A THIRD PROJECT WOULD BE WONDERFUL AFTER THAT COMPLETES AND THIS PROCESS COULD CONTINUE UNTILL WE HAVE EIGHT OR TEN PROJECTS . I AM CERTAIN THAT WE HAVE ROOM FOR TEN PROJECTS SPREAD AROUND THE VALLEY WITHOUT IT FEELING LIKE WE HAVE CARPETED THE DESERT WITH MIRRORS. BALLANCE IS THE KEY.

I AM A TREE HUGGING LEAF EATING ENVIRONMENTALIST!!!

DESERT CENTER WAS A MINING TOWN THAT WENT BUST AND BECAME A PENAL COLONY THAT AGAIN WENT BUST. I WOULD LIKE FOR SOMEONE WHO HAS LIVED THROUGH THAT EVOLUTION EXPLAIN TO ME HOW SOLAR VIOLATES THE ENVIRONMENT.

BEST REGARDS,
HAROLD J. FOSTER

760 567 0037

Thank you for your comment, Gary Vesperman.

The comment tracking number that has been assigned to your comment is SEDDsupp20009.

Comment Date: December 1, 2011 19:01:03PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20009

First Name: Gary
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Address 2:
Address 3:
City: Boulder City
State: NV
Zip: 890051018
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Seven clean energy inventions.docx

Comment Submitted:

It was nice to meet some of you people at last night's solar emergy zones hearing in Las Vegas. I think we all learned some new aspects of solar energy.

In my testimony I claimed that the hydro-magnetic dynamo, electrino fusion power reactor, and electron spiral toroid Spheromak micro-fusion reactor should replace ruining millions of acres of pristine wildlands with solar energy collectors.

For example, for $50 million, an electrino fusion power reactor, about the size of a single-wide manufactured home, could safely and continuously generate 1880 megawatts (nine-tenths of Hoover Dam's nameplate power generating capacity of 2080 megawatts) for 100 years with no fuel and no pollution.

Attached is a file titled "Seven Clean Energy Inventions". It contains brief descriptions of the three above powerful generators. Included are links to lengthy files on them.

The U.S. Government should immediately fund a WW II Manhattan Project-styled program to simultaneously commercialize all three generators ASAP.

Included in the attached file are brief descriptions of four other clean energy inventions - Moe-Joe orgone energy cell, thorium powerpack, capacitive step-down transformer, and environmental heat engines for emergency nuclear fuel cooling.

Vigorous development and commercialization of all seven of these meritorious clean energy inventions would go a long ways towards reducing the need to spoil millions of acres of pristine wildlands with costly solar energy collectors and transmission lines.

Seven Clean Energy Inventions

Compiled by Gary Vesperman, 588 Lake Huron Lane, Boulder City, NV 89005-1018 702-435-7947
garyvesperman@yahoo.com padrak.com/vesperman

Hydro-Magnetic Dynamo

A doughnut-shaped Hydro-Magnetic Dynamo as big as a two-car garage could safely and reliably generate 1000 megawatts minus its 10-megawatt sustaining input power for 25 years or more with no fuel, no pollution, and minimal maintenance.

From 1992 to 1997 in Armenia the third prototype hydro-magnetic dynamo continuously generated a constant current of 6,800 amperes at 220 volts DC – 1.49 megawatts. Its toroid weighed 900 kilograms and had a diameter of 2 meters.

Water flow through the toroid enables the hydro-magnetic dynamo to function as an over-unity electrostatic transformer. Electromotive force is induced by windings around the toroid.

The hydro-magnetic dynamo's production cost is estimated at $500 per kilowatt. The hydro-magnetic dynamo's electricity would be priced .1 cent per kilowatt-hour. Capacities can range from 100 kilowatts to 1000 megawatts. Seven 1000-megawatt hydro-magnetic dynamos can be vertically stacked to combine into a single 7000-megawatt fuel-less hydro-magnetic dynamo.

For comparison, Hoover Dam's 17 generators have a total nameplate capacity of 2080 megawatts.

Inventor: Oleg V. Gritskevitch, Vladivostok, Russia
rexresearch.com/gritskevich/gritskevich.htm
padrak.com/vesperman "Locomotive Power Sources"
Russian Patent WO 011505A1

Electrino Fusion Power Reactor

The electrino fusion power reactor is a safe pollution-free generator of 1880 megawatts, net, of DC electricity. A linear accelerator (jpaw.com) collides two beams of electrons at 940 million electron volts. The electrino fusion power reactor's size would be 80' x 10' x 10'. 150 lbs of brass would be consumed over 100 years before shutdown for accelerator rebuilding. Super novas and η'(938) decay confirm electrino fusion theory.

The energy released in annihilation photons would be 3760 megawatts. "Annihilation photons" are the 940 MeV X-rays produced when a negatron annihilates a proton. These X-rays are converted to electricity by order-to-disorder arrow-reversed photo-voltaic cells with nearly 100% efficiency. To sustain the electrino fusion reaction, 1880 megawatts would be taken from the 3760 megawatts output to power the folded linear accelerator, its eight 35 to 50-megawatt pulsed klystrons, magnets, power supplies, controls, etc.

The first 1880-megawatt electrino fusion power reactor may cost $120 million. Subsequent electrino fusion power reactors would cost $50 million. The price of its electricity would be a little more than .1 cent per KWH. Other applications include anti-matter rockets and annihilation of radioactive waste.

Inventor: Gordon L. Ziegler, Lacey, Washington, USA
benevolententerprises.org box.net/shared/k0g5nkkjfb6okhmyr6um
padrak.com/vesperman "Locomotive Power Sources"

Electron Spiral Toroid Spheromak Micro-Fusion Reactor

The Electron Spiral Toroid Spheromak (ESTS) Micro-Fusion Reactor was derived from an explanation for ball lightning. The ESTS is a plasma toroid that is self-organized and self-stable with no magnetic fields to contain it. All spheromaks reported to date dissipate in microseconds. The ESTS has been observed to endure with no confining magnetic fields for hundreds of milliseconds, and theoretically will remain stable for many seconds. The micro-fusion reactor's fuel comprises of hydrogen and boron.

Safe, pollution-free micro-fusion reactors could reliably generate electricity with capacities ranging from 10 kilowatts through 1000 megawatts at 10% of today's electricity price.

All transportation vehicles could be reliably and safely powered by micro-fusion reactors with substantially lower production, operating and maintenance costs, and without toxic emissions.

The mass and cost of aircraft may be reduced by 70%. Space launch costs may be reduced by more than 95%.

Inventor: Clint Seward, Acton, Massachusetts, USA electronpowersystems.com
US Patents 5,175,466, 5,589,727, 5,773,919, and 6,140,752
padrak.com/vesperman "Locomotive Power Sources"

Moe-Joe Orgone Energy Cell

In spring 2008 a spherical Moe-Joe Orgone Energy Cell, operating as an orgone energy accumulator, was installed in a 1993 Saturn. Orgone energy is transferred from the cell through a tube into the engine via its PCV valve intake. The Saturn's mileage jumped from 30 MPG to 47 MPG with 90% less exhaust pollutants.

The Moe-Joe orgone energy cell comprises of four concentric thin spherical stainless steel shells – 5, 4, 3, and 2 inches in diameter. The ball is filled with specially charged water and then sealed. Holes allow the special water to circulate between the inner shells. The Moe-Joe orgone energy cell does not generate hydrogen nor Brown's gas. Electrodes at the cell's north and south poles are respectively wired to the battery's positive post or engine ground. One end of the orgone energy transfer tube is fitted over a bolt about 30 degrees off the north pole. The charged water itself does NOT enter the engine. It is orgone energy that significantly adds power to the engine.

A car's computer injects more fuel when its oxygen sensor senses the fuel mixture becoming too lean. Special electronics are required to fool the computer. Standalone non-computerized diesel and gasoline generators would consume much less fuel.

Inventors: Joe, Australia, and Moshe Daniel Block, Lachine, Quebec, Canada moe-joe-cell.com
padrak.com/vesperman "Torsion Field Physics and Torsion Field Communications" and
"Advanced Technologies for Foreign Resort Project"
James DeMeo's "Orgone Energy Accumulator Handbook"

Thorium Powerpack

Thorium is abundant enough to power the entire planet for millennia. The Thorium Powerpack is inherently safe with no risk of "meltdown" nor radioactivity contamination. Its nuclear reaction simply stops when its neutron exciter is turned off.

A thorium powerpack's neutron excitor relies on resonant phonon pair cleavage using specifically designed nuclear lattice holo-forms (holographic waveforms) to induce neutron imbalance in a host atom where the host atom then attempts to establish "balance" through the liberation of neutrons.

Maintenance-free thorium powerpacks can generate 50 or 100 kilowatts for home use, and up to 1 megawatts for other uses at 10% of current electricity prices . They actually are "power amplifiers" with power outputs of 60 times over input power.

Inventor: Robert J. Dratch, Black Hawk, Colorado, USA bob-dratch.org
padrak.com/vesperman "Locomotive Power Sources"

Capacitive step-down Transformer

The Capacitive step-down Transformer is a simpler, cheaper, lighter, smaller, nearly 100% efficient alternative to inductive transformers. Capacitive step-down Transformers do not have inductive, noise, heat and sound losses of inductive transformers.

Capacitive step-down Transformers can be used anywhere that is stepping down high voltages, low amperes into lower voltages, higher amperes – industry, commercial, residential and appliances. Not using Capacitive step-down Transformers has resulted in lower efficiency of transmission and distribution with enormous waste of electricity.

Capacitive Power Supplies are inherently capacitive amperage limiting. So therefore short circuits do not damage them. A brownout or blackout in one area of the grid will not take down any generators that are protected with CPS technology. There is no need for electronic controls or a grid infrastructure upgrade – the amperage control is automatic and instantaneous. If a solar flare blows out many inductive transformers, Capacitive step-down Transformers can be fast, effective replacements.

Capacitive step-down Transformers can also be reconfigured quickly and easily onsite to handle more or less wattage or to change voltage and amperage ratios. All applications that use step-down transformers can be converted.

Inventor: George Wiseman, Oroville, Washington, USA
Author of “Capacitive Battery Charger” eagle-research.com

Environmental Heat Engines for Emergency Nuclear Fuel Cooling

Problem: Every century or two the sun aims towards the earth a huge coronal mass ejection causing an electromagnetic storm intense enough to blow out numerous inductive transformers. Power grids could go down for months. But nuclear reactor cooling pumps can only rely on diesel generators for at most a few days. Blackout-crippled refineries would not be able to supply diesel fuel for several months. Without cooling pumps, nuclear reactors and spent fuel storage pools would overheat – releasing catastrophic radiation ala Chernobyl and Fukushima.

Solution: Efficient and pollution-free environmental heat engines absorb ambient heat to expand a working fluid such as Freon or ammonia which pushes pistons through sealed chambers. An environmental heat engine can utilize a nuclear reactor’s own natural low-grade heat to drive an auxiliary generator. The reactor’s cooling pumps can be powered with the generator’s electricity until the local power grid is eventually restored.

Robert Stewart’s "Stewart Cycle" engine, Vapor Actuated Power Generating Device, Patent No. 4,033,136; Ralph J. Lagow's Method of Generating Power from a Vapor, Patent No. 4,693,087; Ken Rauen's Rauen cycle and Superclassical cycle engines; and George Wiseman’s Wise cycle.

Inventors: Robert Stewart, Ralph J. Lagow, Ken Rauen, and
George Wiseman, Oroville, Washington, USA eagle-research.com

Thank you for your comment, Gary Vesperman.

The comment tracking number that has been assigned to your comment is SEDDsupp20010.

Comment Date: December 1, 2011 19:37:20PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20010

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Attachment: Energy Invention Suppression Cases September 3 2007.doc

Comment Submitted:

Attached is my compilation of 95 energy inventions that have been wrongfully suppressed by the U.S. Government and others. Page 55 has this:

The back-pack plasma beam device detected by the AWAC's during limited combat use in the Afghanistan desert was powered by energy storage devices constructed of crystalline lattice materials. After each laser burst, the energy storage devices were recharged every 12-15 minutes (nearly 45 minutes in the dark of night – the residual ambient heat of the desert is a very efficient source of infrared energy) by sunlight, collected and converted to electricity by four-foot square panels of "solar cell" material arrayed on a pole like a flag, each weighing less than ten ounces.

The electrical energy stored in the back-pack energy accumulators was transformed into enormously high voltages and released at almost unbelievably high current levels when the super-capacitors were sufficiently charged. The beam of "light" detected by the AWAC's crews was a field of plasma, flowing at the speed of light and demonstrating characteristics of mass (and, therefore, kinetic energy). The phenomenon represented by these bolts of lightning are not comprehensible according to the model of quantum mechanics and plasma physics currently being used in the West.

Battery packs utilizing these energy accumulator materials have been designed, produced and tested which provide more than 14 hours of continuously transmitted power on a single charge to conventional hand-held cellular telephone devices. Similar improvements in conventional battery/energy storage capacity have been developed and are being tested for such devices as video camcorders, laptop and portable computers and other similar consumer, commercial, industrial and military applications.

IPMS research in the field of layered crystals has thus led to the creation of capacitors with a very high level of capacitance (measured in farads). This technology is based on a revolutionary production technique which forms polarized surfaces of one molecule thickness, separated by less than one atomic diameter of space, held together by weak Van der Waals energy forces. The special properties created by these layered crystalline structures provide previously unimaginable internal surface areas. Super capacitors are constructed of layered materials numbering more than one million dipole sheets for each millimeter of crystal thickness.

These devices provide a virtually limitless number of charge-discharge cycles at astonishingly rapid charge and discharge rates. The potential impact of such devices on all electronic equipment currently being produced is incalculable, since virtually all electronic devices rely extensively on the West's state-of-the-art tantalum capacitance technologies.

At present, IPMS has on hand (among others) a super-capacitor roughly the size and dimension of a sandwich which develops more than 1,200 farads at 10,000 amperes. It also boasts production of a battery whose active mass energy density exceeds 850 watt-hours per kilogram. For the non-scientist (and all the rest of us as well) this means that a "battery" has been produced which, for the first time in history, produces more power per unit of mass than any fossil fuel ever devised.

(End of excerpt)

An alternative to ruining millions of acres of pristine wildlands with relatively inefficient solar energy collectors would be:

a) This Draft Solar PEIS should thoroughly examine the consequences of the scenario where the U.S. Government ends its thorough and sometimes violent suppression of efficient ambient energy collectors and electrical energy storage devices such as those described on page 55 of the attached file.

b) This Draft Solar PEIS should thoroughly and honestly examine the possibility of speedy development and widespread commercialization of IPMS-developed ambient energy collectors and storage devices.

c) This Draft Solar PEIS should precisely compare the cost-effectiveness of installing on rooftops IPMS-developed ambient energy collectors and energy storage devices with vastly less efficient solar energy collectors and transmission lines that would cover and ruin millions of acres of pristine wildlands.

Energy Invention Suppression Cases

Compiled by Gary Vesperman with the help of numerous contributors

Introduction

In their efforts to improve the well-being of their fellow humans, inventors often suffer poverty, slander, and suppression. Inventors of energy devices in particular have been threatened by large energy corporations who are allied with the United States Government and seek to enslave people in subtle ways. The tactics used against energy inventors include "legal" imprisonment on false charges, harassment by the IRS, and outright criminal death threats, beatings, bribery, burglary, vandalism, and arson. At least a few inventors have been murdered if they were not dissuaded by other means.

Sometimes, however, alleged energy inventions actually have been scams, or were tested incorrectly, and their inventors then claimed to be victims of a conspiracy. Many inventors merely have been ignorant of the laws of nature – the history of "perpetual motion machines" provides ample proof of that fact. Many otherwise brilliant inventors have been poor businessmen who signed defective contracts or whose personalities prevented successful negotiations. Some have failed to persevere: it can take decades to bring an invention to the marketplace, and the vicissitudes of life interfered with their plans. Others unfortunately died of natural causes before they achieved success.

Adding to the practical difficulties of pulling out of thin air new energy inventions that have never before been thought of, testing prototypes of some of these energy inventions can be frustrating due to a weird quick of nature. Thomas E. Bearden, Ph.D., reports that certain types of energy inventions interact with their local vacuums. Thus their coefficient of performance can vary from place to place, due to the local vacuums themselves differing. A machine would produce over-unity energy in one location; then inexplicably quit after being moved to another location!

Dr. Bill Tiller, former head of the Materials Science Department of Stanford University, developed a unique detector which required that he "grow" its proper pattern in the local vacuum interaction environment. Experimental results from the detector helped Bearden understand changes in interaction between a local vacuum and a novel machine.

All too many times, however, the conspiracy to suppress new energy inventions has been very real. For energy invention suppression updates, see http://www.energysuppression.com.

<u>Energy Invention Suppression Case Statistics</u>

Number of Energy Invention Suppression Incidents – **95**
Number of Dead, Missing, or Injured Energy Inventors, Activists, and Associates – **20**
Number of Energy Inventors and Associates Threatened with Death – **32**
Number of Energy Researchers and Associates Imprisoned or Falsely Charged – **5**
Number of Incidents of Energy Invention Suppression by the United States Government, Patent Office, Central Intelligence Agency, Federal Bureau of Investigation, U.S. Marshals, Army, Air Force, Navy, Bureau of Alcohol, Tobacco, and Firearms, Defense Intelligence Agency, S.W.A.T. Teams, National Security Agency, U.S. Postal Service, Department of Energy, Department of State, Securities and Exchange Commission, Food and Drug Administration, Department of Defense, Department of Homeland Security, Internal Revenue Service, Rural Electrification Administration, White House, Consumer Product Safety Commission, Small Business Administration, and Canada's Royal Canadian Mounted Police – **59**
Number of Inventions Classified Secret by U.S. Patent Office – **5000**
Number of Incidents Involving Oil Companies – **9**
Names of Companies, Banks, State Agencies, Private Groups, and Universities Involved with Energy Invention Suppression – **Standard Oil, Zapata Petroleum, Atlantic Richfield, Exxon-Mobile, Shell Oil Company, General Electric Company, Yakuza, California Air Resources Board, Organization of Petroleum Exporting Countries, Wells Fargo Bank, Ford Motor Company, General Motors Corporation, Massachusetts Institute of Technology, Queen of England, Kollmorgan, World Bank, Rockefellers, Carlyle Group, and Bush Family**

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Nikola Tesla: Wireless Power and Free Energy from Ambient

Nikola Tesla invented the alternating current electrical system we use today, and dozens of other technologies. Many of his other inventions are fundamental to the modern electrical world. The US Patent Office has 1,200 patents from Tesla, and it is estimated that he could have patented an additional 1,000 or so inventions from memory! Nikola Tesla was undoubtedly one of the greatest scientists who ever lived.

Tesla's "Magnifying Transmitter", built in 1895 at Wardencliff on New York's Long Island, has been suppressed (largely by ignoring and disdaining it), but in recent years it has received new attention for its potential to power civilization with radio-broadcast electricity, possibly even without fuel. The project was financed by John Pierpont Morgan. But Tesla was not an astute business man, and he affected a disdain for money. It is popularly believed that when J.P. Morgan learned that Tesla's system would provide free energy, he stopped funding the work. As reported by Robert Nelson, (see his comprehensive energy inventions web site www.rexresearch.com) the fact of the matter is that, rather than arranging a comprehensive financial agreement for development of the system, Tesla simply dunned Morgan for relatively small sums of money at regular intervals. The personal nature of their financial relationship is evident to anyone who takes the time to read Tesla's correspondence with Morgan (not an easy task, as Tesla's handwriting is difficult to read). For more history, see Leslie R. Pastor's Introduction in http://peswiki.com/index.php/Site:LRP:Motionless_Electromagnetic_Generator. Tesla also built and drove a Pierce-Arrow car during the 1930's which ran on a free energy device without refueling.

Benjamin Fulford in a stunning early July 2007 interview by Jeff Rense (see interview transcript in http://bellaciao.org/en/article.php3?id_article=15376) claimed that his great-grandfather George Taylor Fulford was one of the richest men in the world. He also was the largest stockholder in General Electric. When he learned J.P. Morgan had abruptly backed out of supporting Tesla, Mr. Fulford pressured General Electric to step in. He was going to finance Nikola Tesla, but he was murdered by the Rockefellers in 1905. It was made to look like a car accident. And the family fortune was stolen by the Rockefellers. Benjamin Fulford's grandfather was only three years old at the time. His grandfather didn't know how to suspend his assets.

After Morgan died, his heirs and managers, who did not have a working relationship with Tesla, stopped supporting construction of the transmitter. The tower was demolished during World War II, allegedly because it could serve as a landmark for German submarines. Some modern conspiracy theorists have claimed that it was destroyed in order to suppress the technology. Perhaps so, but in any case, now we suffer with a monstrous grid system that is controlled at many levels, rather than enjoying the energy freedom Tesla had envisioned.

In a speech presented in 1988 on the subject of "Climate Change Factors, Ozone Layer Crisis, and Zero Point Energy Technologies" (see below for complete text) Adam Trombly reported information from a contact that Tesla was poisoned and died in 1943 the night before he was scheduled to go to Washington, DC to meet with President Franklin Delano Roosevelt. Tesla had intended to propose to Roosevelt that perhaps we should look carefully at the fact that we can get all the energy we need from any space we happen to be in. The U.S. Government's Federal Bureau of Investigation confiscated two truckloads of Tesla's written work after his death, much of which remains classified.

Robert Golka: High-Powered Tesla-Type Energy Tower

In 1981 in Wendover, UT, Robert Golka, a well-known Tesla researcher, was victimized by an attack on his workshop which has, for years, been in a deactivated Air Force hanger. His high-powered energy tower outside the hanger was partially destroyed. A witness said insulators and sections of the tower were laying around the base. In the meantime the rent on the Air Force hanger has been raised 1000 percent! These new difficulties now threaten to bring an end to his research with Tesla devices. (Source: http://peswiki.com/energy/Directory:Suppression)

Bruce DePalma: N-1 Homopolar Generator

Harvard-educated Bruce DePalma, who taught physics at the Massachusetts Institute of Technology for 15 years, invented the homopolar electricity generator, also called the "N-Machine", that could provide cheap, inexhaustible, self-sustaining and non-polluting energy. The N-Machine uses principles that flout conventional physics and are still not fully understood. A 100-kilowatt N-1 homopolar generator prototype sat in his garage. It could power his whole house. But DePalma was afraid to turn it on for fear the U.S. Government may confiscate it.

In early November 1980, the night before Bruce DePalma was scheduled to leave for Germany to be the featured presenter at Hans Nieper's Gravity Field Energy Conference in Hanover Germany, DePalma got a phone call from US astronaut Edgar Mitchell claiming "The CIA has information to the effect that if you go to Germany you will not be coming back. And you better watch out what you do there in Santa Barbara, or you might get your head blown off." Mitchell was "best friends with George H.W. Bush" – at that time directing the US Central Intelligence Agency (CIA). DePalma eventually left the USA to live in New Zealand.

BRUCE DePALMA: Free Energy Update 11/14/90. Audio cassette #A1009-90 $9.00.
Live on Something's Happening. Bruce DePalma, inventor of the "N Machine" (so-called "free energy") presents an update on its development including U.S. Navy development, a letter by U.S. astronaut Edgar Mitchell on the validity of the invention, and the forced imprisonment of DePalma's chief backer.

For more information about George H. W. Bush's involvement with the CIA, read the Truthout article "Bush Senior Early CIA Ties Revealed" in http://www.truthout.org/docs_2006/010907P.shtml (9 January 2007). Newly released internal CIA documents assert that the former US President's original oil company, Zapata Petroleum, was established in 1953 by joint efforts with Thomas J. Devine, a CIA staffer.

Devine and Bush visited Saigon early January 1968 shortly before the North Vietnamese launched their Tet offensive. Marshall Douglass Smith in his book *Black Gold Hot Gold –The Rise of Fascism in the American Energy Business* (see below) exposes how the war in Vietnam was not allowed to end until the very day that Standard Oil had completed using the US Navy to explore Vietnam's off-shore oil fields for ten bloody years at nearly no expense to the company. The war was needlessly prolonged by months of silly wrangling over the shape of the Paris peace negotiation table, and by Henry Kissinger's obfuscations.

??????: Mixed Chemical Stone

A mixed chemical stone was found in England and secretized by the Queen. It generated its own electrical sparks. This material appears to be a version of rocks which self-generate voltages such as those researched by John Hutchison, Thomas Henry Moray (see below), and Thomas Townsend Brown. The Queen's holdings are so extensive that it may be that she was not personally involved or even aware of the stone. The Queen may not have very much scientific understanding anyway.

April 7, 2006 Wells Fargo Bank announced they finally invested $5 million of the $1 billion intended for renewable energy. Where did they invest? In a mutual fund: Carlyle/Riverstone Renewable Energy Infrastructure Fund I, Limited Partnership. Funny thing, who are the 3 largest stockholders of Carlyle Group? The answer in order of largest percentage owned: (Source: Al Martin)

1. The Queen of England
2. Bush Family
3. Bin Laden Family

President George W. Bush's brothers Neil and Marvin Bush might be among the secret leaders of ongoing viciously thorough energy invention suppression. See http://www.nogw.com/shadow.html.

Andrija Puharich: Method and Apparatus for Splitting Water Molecules

One of the more interesting research projects in which energy researcher Leslie R. Pastor personally got involved with has been research involving 'water as fuel' dynamics. From the time of Jules Verne to the present 'water as fuel' has been man's quest, if not speculative goal, to discern, decipher and to design. It is well-known that water can be disassociated, and separated into its two components of hydrogen and oxygen. With the use of electrolysis, water is easily disassociated, giving off its properties, in the form of useful gases, but, in very limited quantities, depending upon the amount of current directly used to accomplish its disassociation. From Brown's (Rhodes) gas to 4-space, water is indeed mysterious, ultimately remaining the focus of countless experimenters and practitioners. And still it remains elusive just out of the reach of useful usage. Or has it?

Several recent experiments involving a variety of 'water as fuel' derivatives have ultimately surfaced, strongly indicating that 'hydrogen' based 'energy' structuring is fundamentally possible and will ultimately provide a means at accomplishing a very serious alternative to so-called 'fossil fuel' technologies. What remains to be seen, is whether the existing superstructure involving the monopolistic cartels of "global big oil" and "international nuclear-based companies" will allow any advancement towards 'market' restructuring, without their approval and cooperation.

Oil is just as easily 'cracked' and 'restructured' into 'hydrogen' formats. In fact, it is the goal of both of these factions to ultimately build a network of 'novel' nuclear reactors capable of providing 'electricity' and 'hydrogen' production derived from this combination, precluding any attempt to escape from their monopolistic designs of enforcing their 'control' paradigm.

The suppression of 'water as fuel' technologies invented by small independent inventors, therefore, takes on significance, since this would prevent further monopolistic dominance by the existing cartels, already dominating the existing 'energy' field.

Andrija Puharich (see http://www.andrijapuharich.org/) was granted U.S. Patent No. 4,394,230 for a "Method and Apparatus for Splitting Water Molecules." This method would reportedly split water molecules into hydrogen and oxygen with a net energy gain, and is essentially a perpetual energy device that many believe violates the first law of thermodynamics. Puharich was a very interesting gentleman, with friends in very high places, and led a very dynamic life, incorporating both, style and access, to some of the most powerful components of the political spectrum internationally. Puharich, being a friend of R. J. Reynolds (3rd), found support and protective acceptance, until he fell into disfavor with David Rockefeller, ultimately necessitating him to seek protection from another friend, the [then] Mexican President. Puharich capitulated, acquiescing to Mr. Rockefeller's demands, promising not to engage in further 'water as fuel' research, thereby, stopping all attempts at his sanctioned assassination by the U. S. Government's CIA.

http://www.rexresearch.com/puharich/1puhar.htm
http://waterpoweredcar.com/puharich.html
http://www.zpenergy.com/modules.php?name=News&file=article&sid=1191
http://www.angelfire.com/ak5/energy21/puharich.htm
http://www.keelynet.com/keely/puha1.txt
http://www.wasserauto.de/html/more_cars_.html
http://www.freie-energie.net/index/freie_energie/wasserautos/wasserautos.htm

Pastor mentions Puharich, in his initial introductory statement, because of Puharich's direct relationship within the most significant references of power politics. Puharich was well connected, and respected within the most elite of global society. He was known academically, and internationally among the power elite. He therefore was a significant threat to those special interests involving a direct influence regarding energy sources as fuel derivitives. And his use of 'water as fuel' was a direct threat to one of the most powerful families on planet Earth. Puharich had to personally assure the Rockefeller family that he would no longer engage in further research or usage of 'water as fuel' to power combustion engines. (Source: http://peswiki.com/index.php/Site:LRP:Actual_Case_Histories_of_Suppression_Occurrences)

Neil Schmidt: Hydraulic Wind Turbine

Neil Schmidt stopped in Gary Vesperman's office 12 May 1995 to discuss his invention of a hydraulic wind turbine. Schmidt had lived in Las Vegas for seven years. Nine years previous when he was living in the Seattle area, he went into a federal Small Business Administration office to apply for financial aid. The following day, he received a telephone call and was told it wouldn't work and not to bother with it. He had provided the SBA office hardly more than a sketch so a hot argument erupted which lasted a half hour. The man ended up hinting death to Schmidt if he didn't stop working on his invention. A couple of days later, Schmidt went back to the SBA office and walked around unsuccessfully trying to identify the voice he had heard on the telephone.

Neil Schmidt also has heard that another energy inventor living near his Washington residence had been shot in the head and blinded.

United Nuclear: Hydrogen Fuel System Kit

The United Nuclear Hydrogen Fuel System Kit converts late-model fuel-injected gasoline-powered vehicles to run on hydrogen. In addition to specific complete kits that are planned to soon be available for specific late-model cars and trucks, individual system components will be available for those who choose to assemble their own kits.

Included in the kits (and also available separately) is the company's either solar or wind turbine-powered hydrogen generator that remains in the vehicle owner's garage. The hydrogen generator manufactures the hydrogen fuel for the vehicle at virtually zero cost. Simply put, the vehicle's owner never would have to buy gasoline again. Since there are no major changes made to the engine, a converted vehicle can still run on gasoline at any time.

Powering a vehicle by hydrogen is by no means a new idea, and in fact, almost all automobile manufacturers are currently developing a new generation of vehicles that run on hydrogen as opposed to gasoline. This new generation of vehicles essentially comprises of electric cars that use fuel cell instead of batteries to run the electric motor. Using a chemical process, fuel cells in these new vehicles convert the stored hydrogen on board, and the oxygen in the air, directly into electricity to power their electric motors. These new hydrogen powered electric vehicles are very efficient, and in fact are more efficient than any internal combustion engine. The problem is that these new vehicles are years away from production, are very expensive, and converting to using hydrogen fuel in this manner requires the purchase of a new (and expensive) vehicle. All hydrogen/fuel cell systems currently under development by large manufacturers require the purchase of hydrogen as would be for gasoline.

The United Nuclear Hydrogen Fuel System Kit is an intermediate approach that simply converts existing vehicles to burn hydrogen or gasoline. The stock gasoline fuel injection system remains intact and is not modified in any way. It is shut down while the hydrogen fuel system is activated. The company reportedly operates two test vehicles for which gasoline haven't been bought for two years.

The hydrogen gas is precisely metered into the air intake of the engine while the exhaust gasses are continuously analyzed for correct burn ratio. This allows the driver to switch between running on gasoline or hydrogen at any time. The engine itself is only slightly modified. The conversion makes substantial changes to the computer & electrical system, ignition and cooling systems. Since they never have to be removed, hydrogen fuel storage (hydride tanks) can be installed in virtually any available space within the vehicle.

Due to the fact that hydrogen gas burns so much faster than gasoline, engines with compression ratios greater than 9.5 to 1 are very susceptible to damaging pre-detonation (engine knock). For this reason, hydrogen conversions are not recommended for vehicles with turbochargers, superchargers, or compression ratios greater than 9.5 to 1. Also, because of the higher compression, different ignition system, and host of other factors, the Hydrogen Fuel System will not work on diesel engines.

The company's hydrogen generator produces hydrogen from electricity. The electricity can be common "household current". If the electricity is produced directly from solar power or wind power, the energy cost is zero. Electricity can be produced by Neil Schmidt's hydraulic wind turbine (see above), or by a number of other wind generators such as Number 47 of http://iiic.de/4643.html which is a combined solar/wind electricity generator.

The most productive solar photo-voltaic cell seems to be the Soviet-developed high-efficiency crystal lattice solar photo-voltaic cells described below.

Las Vegas inventor Jeff Prescott invented a method of generating hydrogen by concentrating solar rays to heat pure iron in the presence of water. The iron oxide byproduct can be sold for paint and other uses. Questions remain as to the overall energy efficiency of his process, particularly in regard to refining and transporting the pure iron.

It does, however, take a substantial amount of time to produce sufficient hydrogen to fill even a small tank. As an example, it takes over 2 days of the company's hydrogen generator running at full power, 24 hours a day, to fill its smallest "short range" tank.

The tanks are filled with granulated hydrides which absorb hydrogen like a sponge absorbs water. Hydrogen is pressurized into the material. Hydrides have many advantages over ultra-cold liquid or pressurized gaseous hydrogen. One is that the density of the hydrogen stored in the hydride can be GREATER than that of ultra-cold liquid hydrogen. This translates directly into smaller and fewer storage tanks.

Once the hydride is "charged" with hydrogen, the hydrogen becomes chemically bonded to the chemical. Even opening the tank, or cutting it in half will not release the hydrogen gas. In addition, if incendiary bullets are fired through the tank, the hydride would only smolder like a cigarette. It is in fact, a safer storage system than a gasoline tank.

Then how do you get the hydrogen back out? To release the hydrogen gas from the hydride, it simply needs to be heated. This is either done electrically, using the waste exhaust heat, or using the waste radiator coolant heat.

The company's Hydrogen Fuel System kits heat the hydride tanks electrically. As soon at the hydride is sufficiently warm, hydrogen is released from the tanks, and the on-board computer detects the presence of hydrogen pressure. The fuel system remains in "Hydrogen" mode until the tank pressure begins to drop. If the tanks run out of hydrogen, the engine will seamlessly switch over to gasoline, which enables the car to run conventionally until the hydrogen tanks are refilled at zero cost.

Using hydrogen, the only exhaust products produced are water vapor and a tiny amount of nitrogen oxides. It's about as clean burning as you can get.

United Nuclear's first prototype was a 1994 Chevrolet Corvette that was converted to run on hydrogen. Using the Extended Range kit (2 sets of tanks), the driving range is over 650 miles per fill. As the hydrogen gas is produced using the company-furnished solar-powered hydrogen generator, the resulting fuel cost is near zero.

United Nuclear now has accumulated over 50,000 trouble-free miles on their prototype vehicles. They are currently fleet-testing their systems and are in final preparation for sales to the general public. They will fully guarantee and stand behind all their products and workmanship. Their conversion kits will initially sell for $7,000 to $10,000 each.

United Nuclear has developed every aspect of its Hydrogen Fuel System on their own, using their own funds and not a dime of federal tax money. They do not sell stock, and do not need investors.

Not unexpectedly, the corrupt U.S. Government has swooped in by utilizing its Consumer Product Safety Commission (CPSC) as a means of suppressing the pending commercial sale of United Nuclear's Hydrogen Fuel System Kit by confiscating the necessary chemicals used in this system from public use – possibly basing its action on false premises.

Currently, the CPSC is focusing on common chemical oxidizers such as perchlorate compounds, nitrate compounds, permanganate compounds, chlorate compounds, etc., along with a wide variety of other common chemicals and metals such as sulfur, aluminum, magnesium, titanium, zirconium, zinc, magnailim, benzoate compounds, salicylate compounds, antimony and antimony compounds, etc.

The CPSC now claims that this action is to stop the manufacture by United Nuclear of illegal explosive fireworks. If their true intention is to attempt to curtail the construction of these devices, there are only two chemicals which should be of concern: potassium perchlorate and German aluminum.

For those unfamiliar with exploding fireworks, they are all made from one material: flash powder. Flash powder is a mixture of potassium perchlorate, and a special ultra-fine aluminum powder known as German aluminum. These have been the only 2 chemicals used in the manufacture of every single exploding firework from firecrackers to M-80s from the 1960s to present times.

United Nuclear's Hydrogen Fuel System Kit is not yet available for sale. There are legal problems with several components of the unit which is preventing its sale. Until the legal proceedings are complete, the company won't be moving forward with the system. (Sources: http://www.switch2hydrogen.com/, http://www.switch2hydrogen.com/, http://www.unitednuclear.com/legalactionletters.htm, http://www.wired.com/wired/archive/14.06/chemistry.html, http://nextconservatism.com/2006/11/14/, http://roguestatesmen.blogspot.com/2006/05/who-wants-free-energy-anyway.html, and http://peswiki.com/index.php/Directory:Suppression.)

Daniel Dingel: Converts More than 100 Cars to Run on Water

Inventor Daniel Dingel, who lives in the Philippines, since 1969 has converted more than 100 gasoline cars to be powered by hydrogen derived ON DEMAND from plain water. Aluminum is used in the tank to suppress a possible explosion. The Philippines President is not interested because of an agreement with the World Bank. For a link to a movie abut his water-powered cars, see Section 12-G of http://www.byronwine.com/. For more on the Philippines experience with the international bankers, see http://www.indybay.org/newsitems/2006/04/10/18144521.php.

Maker of water-powered car still fighting after 30 years

By Joey G. Alarilla (see http://www.wasserauto.de/html/inquirer_article.html.)

1969 was a landmark year for a number of reasons, including the conquest of space and cyberspace. Even as that year saw Neil Armstrong and Buzz Aldrin walking on the moon, so was the Internet born when its earliest incarnation, the United States Defense Department's Arpanet (Advanced Research Project Agency network), went online.

In the Philippines, 1969 was also the year that a Filipino inventor claims to have started tinkering with a revolutionary concept for the automotive industry. His idea: To power cars using hydrogen derived from ordinary water.

Today, 30 years later, inventor Daniel Dingel is driving around in the only water-powered car in the world, still complaining that Filipino government officials and scientists refuse to support his invention.

"They keep saying that the government is pro-poor, but what they do is sell off the resources and wealth of the Philippines. The government should really support the development of technology that would help the country pay its huge foreign debt," he said.

At the Inquirer parking lot last Tuesday, Dingel showed off his "concept car"- a red 16-valve Toyota Corolla with the small hydrogen reactor that he invented hooked up to its internal combustion engine (ICE). Dingel's hydrogen car has actually received media coverage since the late '80s or so, but to date his invention has not yet been patented and commercialized. Dingel attributed this to the influence of multinational companies, such as the oil companies. A conspiracy theory worthy of the X-Files, perhaps, but if Dingel's idea is real, then the truth is way out there.

How it works:

According to him, his reactor uses electricity from a 12-volt car battery to transform saltwater or ordinary tap water with salt into deuterium oxide or heavy water, which is chiefly used as a coolant for nuclear reactors. Deuterium is actually a hydrogen isotope with twice the mass of ordinary hydrogen, and heavy water is produced when the hydrogen atoms in H_2O are replaced with deuterium.

"The electricity from the battery splits the water into its hydrogen and oxygen components, and this hydrogen can then be used to power the car engine. Normally it takes temperatures of about 5,400 degrees Fahrenheit to generate hydrogen from water, but here I am just using an ordinary 12-volt battery," he claimed.

Just how this kind of chemical reaction is possible using an ordinary car battery is, of course, the secret behind Dingel's invention – and the kind of claim that leads people to dismiss him as a crackpot and charlatan. In fact, while hydrogen is being touted as a viable alternative fuel in the US and other countries, these prototypes do not make use of internal combustion engines but fuel cell engines, nor do they run on ordinary water but on liquid hydrogen.

For example, DaimlerChrysler unveiled in the US in March the hydrogen-powered NECAR 4 (New Electric Car), which is based on a Mercedes-Benz A-class compact car.

In these fuel cell cars, water is just a by-product of the reaction between hydrogen and oxygen ions, which produces the electricity to run the car's engine. In this sense, the fuel cell process is the reverse of Dingel's discovery. Also, Dingel claims that his reactor can work with any existing ICE-based car.

Dingel said some investors from Taiwan now plan to commercialize his car and help him get an international patent.

(End of excerpt)

Update (*Electrifying Times* (www.electrifyingtimes.com), Vol. 10, No. 2, 2007, page 22):

Dingel did get some of his international patents and was given a sizeable sum of money from yet unknown sources to keep his invention quiet. The secret formula for Dingel's technology as well as the late Stanley Meyer's water cell car is a certain resonant frequency and voltage that allows much lower energy to produce hydrogen and oxygen from water than the standard electrolysis method requires. Stay tuned.

This writer, Gary Vesperman, included a possibly similar invention in his somewhat obsolete compilation of "Advanced Technologies for Foreign Resort Project" which is in http://www.icestuff.com/~energy21/advantech.htm. It is copied as follows:

Water Engine. Hydrogen is formed by creating an underwater electrical discharge between two aluminum electrodes. Aluminum wire is fed against a rotating aluminum drum. A hydrogen-fueled 900-kilogram car runs 600 kilometers on 20 liters of water and one kilogram of aluminum.

The required high voltage can be obtained from the battery, a generator off the drive shaft, or two coils in parallel and fed from a conventional distributor.

The hydrogen gas fills a small buffer tank which in turn supplies hydrogen to the engine on demand. When the tank's pressure exceeds a predetermined level, the electrodes are separated so that hydrogen generation is interrupted. As the pressure drops to a certain level, the aluminum wire is again fed against the aluminum drum.

Ken Rasmussen: Water-to-Energy Electrolysis Process

Ken Rasmussen and his team have been working on a water-to-energy electrolysis process that turns out to have similarities to that of Professor Kanarev. Both use a pulsed signal, and both were seeing similar performance rates. Kanarev holds multiple patents, and is widely published.

Their work ceased after a member of the research team was threatened at gunpoint on 16 May 2006. Unknown to Rasmussen, his associate had faced a violent confrontation with 4 young to middle-aged white males in black suits driving a late model black Lincoln Town Car.

Shoving Glocks and Mac-10s in his face at a rural intersection, they told him extensive details about his family and threatened lives of him, family and all associates if he didn't stop work on the process immediately and NEVER go to the authorities. His associate, now scared for his own life and that of his family, complied. But similarly to Bill Williams' case (see below), when happy people start acting silent and paranoid, friends get suspicious.

In the good old days, big business bullies offered lots of money to buy somebody out and eliminate the competition. Stanley Meyer claimed before his suspicious death that he refused an offer of a billion dollars from Arab oil interests if he would stop work on his electrolysis process. (Meyer received at least eight patents in addition to US Patent 4,389,981 relating to hydrogen and oxygen gasses extracted from water for fuel.)

But to date, NOBODY has offered Ken's company a dime for their "yet bench top" technology. BUT somebody HAS threatened to KILL THEM. Would any skeptic out there care to explain that to Ken? Ken had been in discussion with several pre-screened, suitable investors, who were waiting on Ken's company to fix a final detail before showing them a live demonstration.

Enormous amounts of personal information thrown in their face behind the guns proved to Ken NONE of the prospective investors had anything to do with the violence we experienced. These thugs knew things Ken DIDN'T EVEN KNOW. Their boss has digital cell phone tapping technology at the very least. Other details were probably obtained by wire tapping neighbors and friend's phones too.

For any of Ken's previous business contacts reading this, please excuse the delay. The lives of Ken and his associates have been directly threatened if they were to complete the item they were intending to demonstrate. All progress is stopped.

Given the nature of oil or banking history, who do you think paid these hired gunmen to do the dirty work? Ken would appreciate some solid leads. Ken has to admit, oil has become intertwined with both banking and government over the years; so unofficial policies may have changed.

For more energy invention suppression details, see Ken's web site http://www.commutefaster.com/klooz.html.

Bob Boyce: Brown's Gas Carburetor

Bob Boyce built a carburetor using hydrogen and oxygen previously split using proper frequencies. See http://www.greaterthings.com/News/Tilley/testimonials/related/Bob_Boyce.htm.

From: "Bob Boyce" <theghost@realmcity.com>
To: <sterlingda@greaterthings.com>
Sent: Monday, October 07, 2002 8:38 PM
Subject: GTcontact

Hello there

I just read your response to the message from someone asking why you're promoting a fraud (Tilley), and I must commend you on your response. There are a lot of closed-minded and narrow-minded people out there, most of whom were highly educated in traditional schooling methodology taught at most of the universities and colleges throughout the world. They get this doctrine shoved down their throats that if it's not documented in books and/or upheld by popular theory, then it's just not possible. Any attempt to demonstrate such technology usually falls on deaf ears and blind eyes because they refuse to adjust their thinking to accept that maybe something may be possible after all.

I learned the hard way about how society treats those that dare to do something different. I'm not seeking publicity or recognition for any research I did, just wanted to privately relate my experiences with you and ask that you please not publish or share this with anyone. (See link above. Sterling Allan must have subsequently obtained Boyce's permission to publish his story. Gary Vesperman)

I had an electronics business down in south Florida where I owned and sponsored a small boat race team through my business starting in 1988. We had a machine shop out back of my business for doing engine work, and I worked on engines for other racers and a local mini-sub research outfit that was building surface running drone type boats for the U.S. Government's Drug Enforcement Administration (DEA).

I delved into hydrogen research where I was building small electrolyzer type units that used distilled water mixed with an electrolyte. I would then resonate the plates for optimal conversion efficiency.

I discovered that with the right frequencies, I was able to generate monatomic hydrogen and oxygen, which when recombined, produces about 4 times the energy output of normal diatomic hydrogen and oxygen molecules since the process of combustion does not have to break apart the molecules first before recombining into water vapor. Diatomic hydrogen requires about 4% to air to produce the same power as gasoline, while monatomic requires slightly less than 1% to air for the same power.

The only drawback was storage at pressure causes the mono-atoms to start joining into diatomic pairs, and the mixture weakens, so it must be produced on-demand and consumed right away. I used modified LP carburetors on the boat engines to deal with using vapor fuel. I even converted an old Chrysler with a slant six engine to run on the hydrogen setup and we tested it in the shop.

I never published anything of what I was working on, and we always stated that our boats were running on hydrogen fuel, which was allowed, to avoid any controversy at the races. It wasn't until many years later that I found out what I had stumbled upon was already discovered and known as "Brown's Gas", and there were companies out there selling the equipment and plans to make it.

I had never tried to market anything, but I was plagued with trouble ever since I did the conversion to the old Chrysler and did a few test runs on it in the shop. My shop, which had never had any major crime problems before, suddenly was getting broken into, and pieces of equipment related to the hydrogen project were getting vandalized or stolen. I thought it might be that one of the guys that worked for me might have leaked something to someone and they were trying to either steal the technology or stop me from working on it. I ended up shutting down the research, getting out of it all, converting the boat engines back to racing fuel and selling off the race boats. The break-ins stopped, and I had no further trouble up until I totally closed the business and retired in 1991.

I was struck by lightning in 1995 and in 1997 I moved out of Florida, the lightning capital. I am now crippled with arthritis (which is common amongst lightning strike survivors), and recently I developed congestive heart failure/pulmonary edema. I may be weak in body, but I am determined to try to stay as active as I can. I am currently stripping down an old 1984 Dodge Aries with only 29K original miles so I can convert it over to electric operation.

I have been seeking all information I can find to be able to apply this unique charging arrangement that Tilley is using and to find out what type of electric motor would be best to use with it. I'm in the eastern TN area in the mountains so it must have enough power to climb the uphill grades and hopefully be able to regenerate on the downhill grades. So far I have found very little information on this. Any help you could provide to steer me in the right direction would be appreciated.

Thank you,
Bob Boyce

Stanley A. Meyer: Water Fuel Cell-Powered Car

Stanley A. Meyer invented a water fuel cell, which is not to be confused with the well-known fuel cells using membranes, etc. Meyer's device is supposed to break water into hydrogen and oxygen gases using less energy than that present in the bond itself. Furthermore, ordinary tap water requires the addition of an electrolyte such as sulphuric acid to aid current conduction; Meyer's cell functions at greatest efficiency with pure water.

More precisely, Meyer claimed his super-efficient electrolysis process produces 700% more energy than it consumes (for instance, by connecting it to an engine that would burn the hydrogen back into water) without raising the temperature of the water. Meyer assembled a car prototype powered by a water fuel cell.

Meyer's water fuel cell consists of stainless steel plates arranged as a capacitor – with pure water acting as the dielectric. A rising staircase of direct current pulses is sent through the plates at roughly 42 kilohertz, which is claimed to play a role in the water molecules breaking apart with less directly applied energy than is required by standard electrolysis. The mechanism of this reaction is undocumented.

Using his super-efficient hydrogen separator, Stanley Meyer claimed he could drive a water fuel cell- powered car from California to New York averaging 100 miles per gallon of water.

Meyer has demonstrated his fuel cell device before Professor Michael Laughton, Dean of Engineering at Mary College, London, Admiral Sir Anthony Griffin, a former controller of the British Navy, and Dr Keith Hindley, a UK research chemist. According to these witnesses, the most startling aspect of the Meyer cell was that it remained cold, even after hours of gas production as his system appeared to operate on mere milli-amperes, rather than the amperes that conventional electrolysis would require. The witnesses also stated:

"After hours of discussion between ourselves, we concluded that Stan Meyer did appear to have discovered an entirely new method for splitting water which showed few of the characteristics of classical electrolysis. Confirmation that his devices actually do work come from his collection of granted US patents on various parts of the WFC system. Since they were granted under Section 101 by the US Patent Office, the hardware involved in the patents has been examined experimentally by US Patent Office experts and their seconded experts and all the claims have been established."

Meyer received at least eight patents in addition to US Patent 4,389,981 relating to hydrogen and oxygen gasses extracted from water for fuel. The granting of a US patent under Section 101 is dependent on a successful demonstration of the invention to a Patent Review Board.

U.S. Patent 5,149,407: Process and apparatus for the production of fuel gas and the enhanced release of thermal energy from such gas
U.S. Patent 4,936,961: Method for the production of a fuel gas
U.S. Patent 4,826,581: Controlled process for the production of thermal energy from gases and apparatus useful therefore
U.S. Patent 4,798,661: Gas generator voltage control circuit
U.S. Patent 4,613,779: Electrical pulse generator
U.S. Patent 4,613,304: Gas electrical hydrogen generator
U.S. Patent 4,465,455: Start-up/shut-down for a hydrogen gas burner
U.S. Patent 4,421,474: Hydrogen gas burner
U.S. Patent 4,389,981: Hydrogen gas injector system for internal combustion engine

"It Runs on Water" is a video with Stanley Meyer demonstrating the water fuel cell in a car. Meyer claimed that he could run a 1.6-liter Volkswagen Dune Buggy on water instead of gasoline.

The basic problem with Meyer's invention, as reliably reported by Eugene Mallove in an Infinity Magazine article (see http://www.rexresearch.com/meyerhy/meyerhy.htm), is that he had never consented to conclusive tests. Skeptics point out that electrolysis of water, as explained by chemistry textbooks, requires more energy to break the hydrogen-oxygen bond than is regained by burning the two gases. Nonetheless Meyer's supporters suggest it is worthwhile to try to successfully replicate his process.

Stanley Meyer died after eating at a restaurant on March 21, 1998. Coroner William R. Adrion's autopsy report states that "Decedent supposedly at lunch with N.A.T.O. officials at a Cracker Barrel diner. The group made an opening toast with cranberry juice, immediately after which, decedent ran outside followed by his brother, then vomited violently and told his brother that he had been poisoned."

At the time of Meyer's death this writer, Gary Vesperman, sent out an email explaining that there is a type of stroke in the base of the brain that matches his brother's description of how Meyer died. The victim immediately becomes highly aggravated for a fraction of a minute or so. After the brain soaks up too much blood, its oxygen flow is shut down and the victim then dies.

Meyer's unusual death and its suspicious timing and circumstances understandably cause offerings of conspiracy theories regarding the possible poisoning of his cranberry juice by the oil companies and the U.S. Government. It apparently has not been verified who were with Meyer in the restaurant and exactly what they were celebrating.

The discussion below of Stanley's legal hassles is from http://www.waterfuelcell.org/moreinfo.html. If true, it cites more than one instance of intentional tampering with judicial due process – doubtless to discredit his water-fueled car invention. Either Stanley Meyer's water fuel cell did not in fact achieve his performance claims, or the United States federal government and Ohio state government should instead have been supporting Stanley's research.

Fraud charges:

It failed to work during a required demonstration of the water-fueled car in a 1990 court case. An Ohio court found Stanley Meyer guilty of "gross and egregious fraud" in a case brought against him by disgruntled investors. The court decided that the centerpiece of the car, his water fuel cell, was a conventional electrolysis device, and he was ordered to repay the investors $25,000.

However, in their 1 December 1996 issue, the London Sunday Times published an article entitled "End of Road for Car that Ran on Water" by Tony Edwards. It upheld the court case, stating that three "Expert Witnesses" were not impressed and decided that the WFC was simply using conventional electrolysis. It stated Stan Meyer was found guilty of "gross and egregious fraud" and was ordered to repay the investors their $25,000. It implied that Michael Laughton, professor of electrical engineering at Queen Mary and Westfield University, London was due to examine the car, but was not allowed to see it.

However, not mentioned was that this occurred in 1990 and that the WFC Water Fuel injector tech-base was still under U.S. National Security Review as in accordance to U.S. Patent Law and not available for public viewing. Also not mentioned were the many WFC patents, verified laboratory and university testing that supports the basis of WFC technology nor was the WFC appeal filing to dismiss Judge Corzine's ruling due to judicial default and other relevant information.

On 18 October 1995, a pretrial deposition hearing to inspect the WFC Dealership demonstration units (Variable-plate Electrical Polarization Process (VIC) Fuel Cell and Rotary Pulse Voltage Frequecy Generator Tubular-Array Fuel Cell) was held in the office of the plaintiff's attorney, Robert Judkins. Present were the plaintiff's, their attorneys, plaintiffs expert witness, Michael Leverich (Electronics Engineer), Stan Meyer, Dr. Russel Fowler, WFC witness and defense attorneys Judge Roger Hurley and James Detling, as well as a deposition recorder.

During the deposition, Attorney Judkins attempted to have the WFC dismantled prior to implementing proper test procedures, which Stan Meyer refused. Michael Leverich confirmed that his initial measurements of the WFC Fuel Cells showed that it operated exactly as the WFC documentation stated it should, as so recorded on WFC Deposition Video Tape.

However, he then added an unknown white substance (powder) for additional testing. Stan objected to this, since the WFC Fuel Cell uses plain tap water and does not require a chemical additive. The plaintiffs also admitted that, during their observances at WFC Dealership Seminars, tap water was always used without any chemicals added to the water. Despite Stan's objection, plaintiff measurements were taken of this chemicalized water-bath and recorded. This illegal act of tampering with WFC Evidence of Records was witnessed by WFC Cameraman, Dr. Russ Fowler, and all others who attended Plaintiffs Deposition To-Test.

In 1996, Stan Meyer gave oral testimony before the court demonstrating the WFC Fuel Cell "Mode of Operability" by using the Voltage Intensifier Circuit (VIC) to produce voltage of opposite polarity to separate and disassociate the water molecule into its component gases, hydrogen and oxygen. However, the court audio sound recording equipment seemed to malfunction and was switched off. Judge Corzine said proceedings should continue without it. This was a violation of judicial protocol, since the recording system is used to verify testimony given during the trial and as such becomes "Evidence of Records."

After his oral testimony, Stan expected Attorney/Judge Hurley to start bringing forth WFC witnesses and counter arguments. Instead, Attorney/Judge Hurley spoke up, stated he had to leave for a pre-planned vacation and said that there was no more testimony to be given and waived the right of the defendant to give a case summary of the WFC facts brought before the court. Stan Meyer immediately stated he would protest, and Judge Corzine ended the hearing.

Stan wrote a "Request to Retract" fax-letter to the Sunday Times on 2 December 1996. He attached WFC documentation on the filing with the Disciplinary Counsel. He further stated that Judge Corzine had no right to turn off the court audio sound recording equipment, nor to rule against U.S. Patents, or overrule Government and University lab reports in the public domain concerning the mode of operability of the WFC Technology. Furthermore, Stan pointed out that no US Federal "Cease and Desist" order has ever been issued against WFC since the WFC Technology has been fully legalized under US Patent Security Law 35 USC 101 and other US Federal regulatory Acts. His final statement was that "WFC is here to stay" in contradiction to the Sunday Times statement.

Stanley Meyer's twin brother Stephen Meyer has warned per his email below that the above is not wholly true. Attempts by Gary Vesperman to obtain Stephen's corrections have been unsuccessful. Stephen's web site www.hydrotechgroup.com still does not include any information which could clarify Stanley's apparent suppression troubles and suspicious death.

From: Stephen Meyer [mailto:appli-tech@msn.com]
Sent: Wednesday, March 14, 2007 12:18 AM
To: altenergy2007@gmail.com
Subject: RE: Fwd: Terry Sisson on Stanley Meyer; Xogen

HI Guys, go to my web site www.hydrotechgroup.com

Oh! Gary Vesperman's write up is really bad and does not reflect true events about Stan and is completely out of context in many areas. It is my hope that this is article is corrected before publishing. Stephen Meyer his twin…

Stephen Meyer
Appli-Tech@msn.com
Office Phone: 1.612.374.1609

Frank Roberts: Water Car

Frank Roberts is active on the Yahoo water car chat board. He was gone for a while. Then he showed up with this story that was emailed to the Yahoo water car chat board on October 4, 2005. His location is unknown. He is trying to rebuild what he had from memory, but is having a difficult time at it.

Subject: I'm Back

Hello to everyone in the water car group from Frank Roberts

To the older members of the group I say hello; to the newer ones I'm a member who had a working water car and was preparing to go cross country and see some of the members, etc. My last message was about a year and a half to two years ago, I'm not sure. At that time I reported to the group that my office was invaded by authorities and all my paper work was photographed and some taken. My van that I was working on for a carbureted vehicle was burned in the middle of the night, and my fuel injected Taurus was taken. I suffered a chemically induced stroke and am now in a nursing home. I have lost part of my long term and short term memory. My paralysis is pretty much gone, and I now have internet access in my room. I have a lot of catching up to do on the progress of the group. I no longer have my lab and all its resources but will try to contribute from experience and expertise. I look forward to hearing from the group. It's good to be back on line.

Best Wishes,
Frank Roberts

Andrew Leech (Reporter): Suspicious Deaths of Inventors in Australia

From: Andrew Leech
To: sterlingda@pureener gysystems. com
Sent: November 02, 2006
Subject: BJ Proton Cell

Hello, I'm Andrew Leech from Floppy Sponge Automation in Melbourne, Australia. I've been a keen experimenter in a number of energy areas for some time now, both privately and through FSA. I'm especially interested in the Joe Cell and could help in a setting up a reliable demonstration model of the Proton Cell variant as well as helping to spread and promote the technology… [Deleted]…

I personally believe if we can have development undertaken relatively quietly through supportive channels such as PES Network, and produce a number of engines running this way privately, then distribute them quietly aver a large area (Colin at FSA has numerous contacts right across Australia, Malaysia and Taiwan), when it is announced publicly it will already be out there too widely to be hushed up. I've heard reliable confirmations of suspicious deaths on inventors in Australia, so don't want to take the threat lightly. If we can have a large group of replications all announced simultaneously we have a chance of getting around that threat… [Deleted]…

Regards,
Andrew Leech
Floppy Sponge Automation
12 Birch Ave Dandenong Nth,
Vic, Australia 3148
http://www.floppyspongeonline.com

Gerald Schaflander: Solar-Produced Hydrogen Turned into Liquid Hy-Fuel

During the 1970s Gerald Schaflander, with the Solar Electric Power Corporation of Culver City, California, and with financial help from some friends, built a pilot production facility in Menlo Park, California. Schaflander had developed gallium aluminum arsenide/gallium arsenide solar cells and was producing hydrogen with the cells' output, which was then chemically turned into a liquid fuel called Hy-Fuel. The fuel could be utilized in cars or trucks. It was not used as a liquid but as hydrogen gas, by cracking it and feeding the recovered hydrogen gas through a special carburetor.

Schaflander and his scientists had found from their own experiments that silicon will not work. It deteriorates in the desert heat and becomes only about 2 percent efficient. Having found silicon cells unsatisfactory, Schaflander's scientific team perfected gallium aluminum arsenide/gallium arsenide solar cells. They also found a way to produce such cells on a semi-automated basis, slashing costs. Some of the photovoltaic cells used to power NASA spacecraft cost as much as $5 a watt to produce; Schaflander's automated process reduces the cost to 27 cents a watt.

The prototype of a commercial Hy-Fuel production facility on 1000 acres of leased land near Yuma, Arizona comprised of two lines of slanted solar panels that gather the sun's rays. Behind them were rounded, cylindrical "parabolic concentrators" that intensify the energy collected by the panels and focus it on photovoltaic cells. The cells produce electrical energy, and electrolysis then splits the hydrogen atoms from water. The hydrogen gas so produced is turned into a stabilized liquid similar to ammonia. The liquid Hy-Fuel is fully substitutable for fuel oil or for gasoline in automobiles, tractors and other vehicles. These are connected by wires and tubing to a small pumping station and rounded storage tanks.

This Yuma solar energy farm was the creation of Consumers Solar Electric Power Corporation of Culver City, California. On July 1, 1980 the firm had its first commercial tank load of 250 gallons of Hy-Fuel ready for delivery at only 50 cents a gallon, and was producing more Hy-Fuel. With an option on leasing another 10,000 acres and given financial support, the facility could be cranked up to full production on the entire 11,000-acre tract in six months. According to Stephen Wright, president of Consumers Solar and its scientific expert, with eight hours of continuous Arizona sunlight a day, such an energy farm would produce 3.8 million gallons of Hy-Fuel a day.

Hy-Fuel production could be increased considerably by substituting Soviet-developed high-efficiency crystal lattice solar photo-voltaic cells (see below).

A unique co-generation system would turn the waste heat produced by the process into low-pressure steam that could be used to drive turbines producing electric power for the utilities. Schaflander estimates that his company's energy farm could produce electricity at a capital cost of $690 per kilowatt. The capital-cost figures for fossil-fueled and nuclear-powered plants are $1,200 and $1,400 per kilowatt, respectively. Note that these are 1980 figures.

Conversion of present engines to hydrogen fuel can be accomplished in a few hours. The process involves removing the gasoline tank and installing a new tank capable of holding the slightly heavier hydrogen hydride mixture. A "cracker" would be positioned in the front of the car next to the motor to convert the ammonia-like Hy-Fuel into a gas mainly composed of hydrogen. This gas would flow into a new carburetor to which a fuel regulator is attached. Certain other solenoid valves and vacuum and pressure switches would be wired into the car. The hydrogen-powered vehicle would then be ready to roll.

There is no question that Hy-Fuel works. Schaflander had converted eighteen Chevrolet engines to his revolutionary fuel and had driven them across the continent, getting about twenty miles to the gallon. Tests show that Hy-Fuel's emissions are far cleaner than gasoline, obviating the need for costly emission devices such as catalytic converters which poison roadsides with toxic platinum dust particles. Hy-Fuel is also more stable than gasoline – far less likely to explode in case of an accident.

All this was developed without a dime of federal tax money. In 1978 Schaflander challenged a U.S. House of Representatives Energy Committee to let him test his device on a selected fleet of U.S. Government cars. Although he asked for no up-front money and had promised, "If we can't deliver, we don't get paid," the U.S. Government turned him down.

Schaflander was harassed by oil company-inspired opposition, including telephoned death threats to his 79-year-old mother and quite "official" opposition from the U.S. Postal Service. His company was essentially driven out of business. The whole story is described by a long article that was published in the October 4, 1980 issue of *The Nation*. There is much detail on the suppression, but little data on the actual process used. (Source: "The Hydrogen Alternative: Somebody Doesn't Like Hy-Fuel" Fred J. Cook, *The Nation*, October 4, 1980, pp. 305-311)

John Andrews: Water-to-Gasoline Additive

In May 1974 John Andrews, a Portuguese chemist, demonstrated a water-to-gas additive before Navy officials which allowed ordinary water to be added to gasoline without decreasing the combustibility of the gas and would drive the cost of gasoline down to 2 cents per gallon. When Navy officials finally went to his lab to negotiate for the formula, they found Andrews missing and his lab ransacked.

Phil Stone: Engine Runs on Water

During the 1950's, Phil Stone, a retired Florida college physics professor, had a patent for a device to run an engine on water. The U.S. Government then unfairly classified his patent, and this prevented him from developing his device. The United States Patent Office has classified 5000 patents, an unknown number of which relate to energy. Their helplessly shackled inventors will be jailed for 20 years if they work on, develop, make, sell, write about, or even simply talk about their inventions.

Bill Williams: Joe Cell-Powered Truck

(Excerpted from http://pesn.com/2006/04/13/9600257_Bill_Williams_threatened/, written by Sterling Allen, Pure Energy System News)

Joe Cell Truck Builder Threatened, Destroys Plans --- After announcing that he had successfully built a truck that runs on Joe cell technology, drawing energy from water and orgone energy, Bill Williams said he was approached by two men who demanded that he stop his research, threatening him with dire consequences if he didn't. Others are keeping it alive.

USA -- A couple of weeks ago, Bill Williams told a discussion list that he successfully ran his truck on a device known as the Joe cell. The power was far greater than the regular combustion engine -- and the energy was free.

The Joe cell is said to draw on orgone energy. The fairly simple device uses electrically charged water as the "gate" or medium through which the aetheric energy is drawn from the surroundings and transferred to the automobile engine.

Bill had posted images and rough descriptions, and was in the process of disclosing in greater detail how he had accomplished this, when he was confronted last week by two unidentified individuals who told him to cease all of his alternative energy work or there would be dire consequences.

On April 11, 2006, Bill gave the following account of what happened just a few days after announcing his success.

"I was on my way home Thursday last week [April 6, 2006] and was about 3 miles from the ferry project. I stopped to check the post connection point on the Cell. I was standing in front of my truck, and this late model 2005 or 2006 Ford Explorer pulled up and parked diagonally in front of my truck.

"The driver got out of the rig and walked around in front of their rig and approached me. At about the same time, the passenger opened his door.

"The driver stated that they wanted me to stop working on all forms of alternative energy. He also stated that we know everything about me, my family, and all my projects past and present.

"At about that time the passenger reached and held up a file that was about 2 or so inches thick. He opened it up and showed me telephone transcripts, emails, messages from the groups that I had belonged to.

"They knew where my kids worked, the times they are at work; also my wife's working hours, my grandkids' school, etc. They knew everything.

"The driver said that if I did not stop working on this (he then opened up the left side of his jacket and showed his weapon that was holstered) that there would be other consequences.

"He also stated that he wanted me to post that I was no longer working in this field and to destroy all my work, i.e. cells, drawings, lab journals, everything!

"At that point he walked around and got into the rig. I shut the hood and got the hell out of there. They followed me for about 2 miles and then must have turned off somewhere."

After a few days of contemplation, Bill decided to abide by the demands of those who threatened him. He destroyed the cell and all data and documentation and disabled the website on which he had posted plans. Four days after that incident, Bill wrote the following message to the group:

"I thought I was strong but when illness to the family comes into play, I have failed. I am truly sorry. I will not be working in any form of alternative energy field anymore. [...]

"I destroyed my device tonight along with my written data and lab notes as per specked out."

Thomas E. Bearden, Ph.D.: Motionless Electromagnetic Generator

In March 2002, Stephen L. Patrick, Thomas E. Bearden, James C. Hayes, Kenneth D. Moore, and James L. Kenny received U.S. Patent No. 6,362,718 for the Motionless Electromagnetic Generator (MEG), a scalar energy device that produces over-unity (AKA "Free Energy"). In conventional terms, the device has a Coefficient of Performance (COP) of 5.0.

Tom Bearden offers this brief description of how the Motionless Electromagnetic Generator works:

First the MEG uses a proven technique (the Aharonov-Bohm effect) which the nanocrystalline core furnishes freely. Recall again that memory characteristics of materials is one thing (from Prigogine) that allows direct and intentional violation of the second law of thermodynamics.

This free initiation of the Aharonov-Bohm effect in turn engineers the surrounding vacuum outside the core, by adding extra energy density to it in the form of a curl-free A-potential. Sharp perturbation (the rise time and decay time) of the input pulses that perturb the core-confined B-field, also perturb that section of the A-potential still in the core, so that a disturbance of dA/dt passes outside the core and on outward into the external altered vacuum with its extra energy.

There the equation $dA/dt = - E$ applies, and so in the external activated space real E-field energy pulses are formed which radiate back into the MEG core area due to the minus sign. This means they travel in opposite direction to the outward-traveling perturbation dA/dt.

Hence this shows the receipt by the MEG of excess electromagnetic energy freely transmitted back into it from the external altered space, which means that the MEG gets considerable excess E-field energy input from the surrounding vacuum. By adjusting perturbation rise times, etc., one can adjust the magnitude of the E-field energy pulses returned to the MEG from the external vacuum environment. Thus the MEG is an asymmetric Maxwellian system of the kind arbitrarily discarded by Lorentz in 1892, and still arbitrarily discarded by present EE departments, professors, and textbooks.

Comprised of strong magnets, coils, nanocrystalline cores, and a controller unit with the electronics, the MEG would be able to power an electric vehicle without battery recharging by the power grid.

For a detailed explanation (including clear drawings) of how the MEG works, see Dr. Bearden's paper "Engineering the Active Vacuum: On the Asymmetrical Aharonov-Bohm Effect and Magnetic Vector Potential A vs. Magnetic Field B,". This paper is available at the link http://www.cheniere.org/techpapers/On%20the%20Aharonov-Bohm%20Effect1.doc.

In that paper, Dr. Bearden points out that electrical engineers – and even the usual physicist – are unaware of how an electrical circuit is actually "powered". For an explanation and a diagram showing (1) where the energy pouring from the generator terminals actually comes from and how, and (2) why the normal electromagnetic systems self-enforce COP<1.0 by killing their own source of this free energy flow faster than they power their loads, see Figure 2, Operation of a Symmetrical Electrical Power System, in the foregoing paper.

Note that there are more than 20,000 papers in the hard literature on the Aharonov-Bohm effect used by the MEG, and that Aharonov-Bohm effect is quite well proven in physics, both theoretically and experimentally. But the effect does not even exist in the electrical engineering model! Since the MEG is deliberately designed to use that effect, the operation of the MEG can only be understood by one who understands the Aharonov-Bohm effect, its generalization to the Berry phase, and the further generalization to the geometric phase. Specifically, any electrical engineer – using only mainstream electrical engineering theory – can not and will not be able to understand the MEG's operation.

There are several sources of the special nanocrystalline cores which contain the "B" field needed to effectively operate the MEG. Dr. Bearden reports in http://www.cheniere.org/correspondence/020504.htm that the nanocrystalline cores originally were purchased as Metglas amorphous alloys from the former Division of Honeywell that made them. He believes that Honeywell actually got them from India. That Division of Honeywell was just about demolished by General Electric (GE) in its sudden attempted buyout of Honeywell (vetoed by the European community). GE suddenly moved it across country, wiping out half its staff and scientists, etc. Then GE withdrew. With the Division in shambles, Honeywell then sold it off to Hitachi. He doesn't know what's happened since then

(Sources: http://jnaudin.free.fr/meg/megv21.htm, http://peswiki.com/index.php/Site:LRP:Motionless_Electromagnetic_Generator, and http://peswiki.com/index.php/Site:LRP:The_Suppression_of_the_M.E.G._by_General_Electric. For additional information, order Dr. Bearden's books and videos from www.cheneire.org.)

Thomas E. Bearden, Ph.D. (Reporter): J.P. Morgan Emasculated Electrical Engineering Theory

Thomas E. Bearden, Ph.D., in an August 5, 2007 email to Gary Vesperman and three other energy researchers, offers an insight into what really happened more than a century ago when the foundations were laid for eventually providing electricity to billions of people. In the 1880s and 1890s Nikola Tesla (backed by Westinghouse, a decent man) destroyed the great dreams and preparations of John Pierpont Morgan and Thomas Edison for moving the world into DC electrical power, requiring a DC power plant about every two miles, for example. Instead, with the support of Westinghouse, Tesla gave the world the much more practical AC power systems, where the electric power is much more easily transmitted over transmission lines to distant destinations, without the serious losses as DC transmission entails.

This and Tesla's clearly enunciated intention to give the world clean free electromagnetic energy from the "active medium" itself, brought J. P. Morgan to regard Tesla as his mortal enemy, to be destroyed or curtailed at any cost. Then with the near-bankruptcy of Westinghouse, the only person Tesla could turn to for financing was J. P. Morgan himself. The university attended by Morgan in Germany was the heart of the Hegelian method, which uses the technique of funding and backing one's own enemies as well as one's supporters, to gain influence over – and eventually control of – both. So when Tesla approached Morgan for financing, Morgan readily agreed – but only after Tesla signed over a 51% controlling interest in his (Tesla's) patents.

Tesla did so, and that put control of Tesla, his patents, and his great new project directly under Morgan's control. Morgan then simply advanced Tesla only part of the money needed for his tower project, and when Tesla predictably ran out of funds, Morgan simply refused to give him any more. Very shortly this completely crushed Tesla, reducing him to effective bankruptcy, living in a hotel room, and existing on the patience and literally the charity of others. Tesla never recovered from this blow, but eventually died in that hotel room. Many of Tesla's inventions – such as radio – were stolen from him. After Tesla expired in 1943, Marconi's inventions – e.g. – were officially declared as take-offs of Tesla's inventions by the U.S. Supreme Court.

Isn't it significant that essentially none of our scientific history books credit Tesla for being the actual inventor of the radio, but instead give credit to the theft of Tesla's radio discoveries by Marconi? What does that say about the "official" ethics of the scientific community?

But Morgan was not only ruthless, but thorough. In the latter 1880's, etc., when Tesla was gung ho to give us free energy from the active medium, Morgan also anticipated the future of this "energy freely extracted from the active medium" problem that had suddenly risen in Tesla's work. At the time, there were less than three dozen "electrodynamicists" in the entire world. Maxwell had died in 1879, and those who despised quaternions (Heaviside, Hertz, Gibbs, etc.) immediately chopped Maxwell's 20 quaternion-like equations in 20 unknowns into a very much smaller vector subset containing only four equations. Maxwell's theory was never accepted during his own lifetime, but only begrudgingly and very slowly after (eight or nine years after Maxwell's death) Hertz performed speed-of-light measurements showing Maxwell was correct.

The real Maxwell theory has never been routinely taught in electrical engineering, which contains only a pale shadow of it. For the full Maxwellian theory, see James Clerk Maxwell, "A Dynamical Theory of the Electromagnetic Field," Royal Society Transactions, Vol. CLV, 1865, p 459. Read Dec. 8, 1864. Also in The Scientific Papers of James Clerk Maxwell, 2 vols. bound as one, edited by W. D. Niven, Dover, New York , 1952, Vol. 1, p. 526-597. Two errata are given on the unnumbered page prior to page 1 of Vol. 1. In this paper Maxwell presents his seminal theory of electromagnetism, containing 20 equations in 20 unknowns. His general equations of the electromagnetic field are given in Part III, General Equations of the Electromagnetic Field, p. 554-564. On p. 561, he lists his 20 variables. On p. 562, he summarizes the different subjects of the 20 equations, being three equations each for magnetic force, electric currents, electromotive force, electric elasticity, electric resistance, total currents; and one equation each for free electricity and continuity. Most electrical engineers have never even read Maxwell's theory, even though they were falsely informed that they had studied (and mastered) "Maxwell's theory."

Free download of that original Maxwell theory can be made directly from the ZPE website, at links

http://www.zpenergy.com/downloads/Maxwell_1864_1.pdf
http://www.zpenergy.com/downloads/Maxwell_1864_2.pdf
http://www.zpenergy.com/downloads/Maxwell_1864_3.pdf
http://www.zpenergy.com/downloads/Maxwell_1864_4.pdf
http://www.zpenergy.com/downloads/Maxwell_1864_5.pdf
http://www.zpenergy.com/downloads/Maxwell_1864_6.pdf
http://www.zpenergy.com/downloads/Diagram.pdf

Barrett (one of the co-founders of ultrawideband radar) comments on the curtailing of Maxwell's theory as follows:

"[T]he A field [for the potentials] was banished from playing the central role in Maxwell's theory and relegated to being a mathematical (but not physical) auxiliary. This banishment took place during the interpretation of Maxwell's theory... by Heaviside... and Hertz. The 'Maxwell theory' and 'Maxwell's equations' we know today are really the interpretation of Heaviside... Heaviside took the 20 equations of Maxwell and reduced them to the four now known as "Maxwell's equations". [Terence W. Barrett, "Electromagnetic Phenomena Not Explained by Maxwell's Equations," A. Lakhtakia, ed., Essays on the Formal Aspects of Electromagnetics Theory, World Scientific Publishing, River Edge, NJ, 1993, p. 11.]

Actually it was worse than that! Heaviside hated potentials (which today we know are primary), thought they were mathematical conveniences only, and that they should be "murdered from the theory". Quoting from B. J. Hunt:

"In a letter to Oliver Lodge in 1893, Heaviside referred to his own work and stated that it represented '….the real and true 'Maxwell' as Maxwell would have done it had he not been humbugged by his vector and scalar potentials.' [B. J. Hunt, The Maxwellians, Ph.D. dissertation, The Johns Hopkins University, Baltimore, MD, 1984, p 317].

Heaviside also thought (as did all others at the time) that a thin material fluid ether filled all space, so that nowhere in all the universe was there a point where mass was absent. For that reason, the electrodynamicists – including Heaviside – thought there were force fields E and H in space, when today we know such electromagnetic force fields exist only in charged matter (matter is a component of force, by the equation F = d/dt(mv). Quoting Feynman:

"…in dealing with force the tacit assumption is always made that the force is equal to zero unless some physical body is present… One of the most important characteristics of force is that it has a material origin…" [Richard P. Feynman, Robert B. Leighton, and Matthew Sands, The Feynman Lectures on Physics, Addison-Wesley, Reading, MA, Vol. 1, 1964, p. 12-2].

For a commentary on even the unsatisfactory condition of the original Maxwell's theory, Cornille states it this way:

"Even today, Maxwell's equations are given as granted, their validity being justified by experiments. In fact, there is no demonstration of Maxwell's equations from first principles since the mechanical approach used by Maxwell has been abandoned in favor of a new non-mechanical entity: the electromagnetic field. Of course, Maxwell's equation[s] can be obtained from a variational principle but they are derived from an action appropriately chosen in order to recover them. …Maxwell's equations raise a certain number of fundamental questions which have not been answered in a satisfactory manner to date." [Patrick Cornille, "Inhomogeneous waves and Maxwell's equations," Chapter 4 in Essays on the formal Aspects of Electromagnetic Theory, Ed. A. Lakhtakia, World Scientific, 1993, p. 138-139.].

But it made no big splash, and the Heaviside severely truncated equations were "chosen" as the basis equations for the new "electrical engineering" that was beginning to be set up in a few universities here and there. Morgan apparently had the "new" equations (for the new electrical engineering being born) checked via group symmetry (adopted in 1870, so therefore well known by the very few leading electromagnetic scientists of the world at the time) to see if the "new" science/equations contained any of those "systems taking excess free energy from the active medium" – in short, containing any of Maxwell's asymmetrical systems present in the full Maxwellian theory. In short, Morgan was determined not only to suppress Tesla, but also to suppress any future "young Tesla" who might be stimulated to see and develop "free energy from the active medium" Tesla systems. The review of Morgan's scientific advisors was not good; the "new" and truncated Heaviside equations were still not totally symmetrical, which meant some of those dirty old asymmetric Maxwellian systems were still there.

Morgan, of course, just directed that it be "fixed". And Lorentz was the fellow chosen or arranged to do the job; in 1892, Lorentz arbitrarily symmetrized the Heaviside equations – just to "make them easier to solve algebraically", so the story went. He thereby firmly excluded all asymmetrical Maxwellian systems from the standard electrical engineering model, from its very birthing.

Lorentz was a great scientist in his own right, but also was fond of appropriating and using other people's work and taking credit for it himself. For example, the whistle was finally blown on this aspect of Lorentz, by the great electrodynamicist J. D. Jackson. See J. D. Jackson and L. B. Okun, "Historical roots of gauge invariance," Reviews of Modern Physics, Vol. 73, July 2001, p. 663-680. Even the symmetrical regauging used by Lorentz (and credited to him generally) was first done by Lorenz (without the "t"), as Jackson and Okun show.

To see the original Lorentz "suppression" paper applying symmetrical regauging, see H. A. Lorentz, "La Théorie électromagnétique de Maxwell et son application aux corps mouvants," [The Electromagnetic Theory of Maxwell and its application to moving bodies], Arch. Néerl. Sci., Vol. 25, 1892, p. 363-552. [Also in H. A. Lorentz, Collected Papers, The Hague : Martinus Nijhoff, vol. 2, pp. 168-238, esp. p. 168.] This is the work that Lorentz cites later (in 1895) for his proof of the symmetrical regauging theorems (the two equations of symmetrical regauging).

This is what arbitrarily eliminated (from standard electrical engineering) the use of "Tesla" asymmetrical Maxwellian systems that do receive excess electromagnetic energy freely from the active medium – and thus can function at a coefficient of performance (COP)>1.0 precisely similar to a windmill-driven electrical power system or a solar panel powered electrical power system. A real system with real losses will always have efficiency (total useful energy or work output divided by the total energy input from all sources) of less than 100%. But if it asymmetrically receives (freely or nearly freely) excess energy from its active environment, then its coefficient of performance (total useful energy or work output divided by the total energy input by the operator only) can permissibly exceed 1.0. No laws of nonequilibrum thermodynamics are violated, as are no laws of physics.

Two persons – Oliver Heaviside and John Poynting – independently and simultaneously discovered the flow of electromagnetic energy through space in the 1880s and early 1890s; before then, the concept does not appear in physics. Poynting only considered a very tiny part of the "total electromagnetic energy flow pouring from the generator terminals and flowing through space outside and along the external conductors (of the external circuit)". That tiny part is the small fraction of the energy flow – the linear part – that gets diverged into the conductors to "potentialize and power up the electrons" and the external circuit. Heaviside also discovered a giant curled electromagnetic energy flow component in addition to the diverged little component. The nondiverged curled electromagnetic energy flow component is more than a trillion times greater in energy magnitude than the feeble Poynting component.

Well, again it would simply not do (in Morgan's relentless view) for our young future electrical engineers to know and be taught that the generator actually outputs more than a trillion times as much electromagnetic energy output as the mechanical energy input one furnishes to crank the shaft of the generator. That would mean it would just be a matter of time before some young budding genius would discover how to trick some of that giant curled Heaviside component into diverging into the conductors after all, thus producing Tesla "energy from the external active medium" systems after all.

So again, Morgan would have issued orders to "fix it!"

And so Lorentz was arranged once again to do the dirty work. In 1900 he stated that this giant curled Heaviside component "does nothing", since it does not interact, and so it "has no physical significance". And he arbitrarily just integrated the entire energy flow vector (containing both the diverged Poynting energy flow component and the usually nondiverged Heaviside giant curled energy flow component) around a closed surface assumed around any volume element of interest. Thereby Lorentz misinformed us that this nondiverged giant energy flow had "no physical significance" and taught us to just deliberately cancel it as a matter of course.

In his August 16, 2007 email to Gary Vesperman and Leslie Pastor, Thomas Bearden adds:

For additional rigorous mathematical demonstrations, see the following:

M. W. Evans et al., "Explanation of the Motionless Electromagnetic Generator with O(3) Electrodynamics," Foundations of Physics Letters, 14(1), Feb. 2001, p. 87-94. Quoting: "…the fundamental operational principle of the MEG is explained using a version of higher symmetry electrodynamics known as O(3) electrodynamics, which … has been developed extensively in the literature. The theoretical explanation of the MEG with O(3) electrodynamics is straightforward: Magnetic energy is taken directly ex vacua and used to replenish the permanent magnets of the MEG device, which therefore produces a source of energy that, in theory, can be replenished indefinitely from the vacuum. Such a result is incomprehensible in U(1) Maxwell-Heaviside electrodynamics."

M. W. Evans et al., "Explanation of the Motionless Electromagnetic Generator by Sachs's Theory of Electrodynamics," Foundations of Physics Letters, 14(4), 2001, p. 387-393.

M. W. Evans et al., "The Aharonov-Bohm Effect as the Basis of Electromagnetic Energy Inherent in the Vacuum," Foundations of Physics Letters, 15(6), Dec. 2002, p. 561-568.

T. E. Bearden, "Extracting and Using Electromagnetic Energy from the Active Vacuum," in M. W. Evans (ed.), Modern Nonlinear Optics, Second Edition, 3 vols., Wiley, 2001; Vol. 2, p. 639-698.

A quote of interest is: “This has led to one of the greatest ironies in history: All the hydrocarbons ever burned, all the steam turbines that ever turned the shaft of a generator, all the rivers ever dammed, all the nuclear fuel rods ever consumed, all the windmills and waterwheels, all the solar cells, and all the chemistry in all the batteries ever produced, have not directly delivered a single watt into the external circuit’s load. All that incredible fuel consumption and energy extracted from the environment has only been used to continually restore the source dipole that our own closed current loop circuits are deliberately designed to destroy faster than the load is powered.”

T. E. Bearden, "Energy from the Active Vacuum: The Motionless Electromagnetic Generator," in M. W. Evans (Ed.), Modern Nonlinear Optics, Second Edition, 3-vols., Wiley, 2001; Vol. 2, p. 699-776.

M. W. Evans, T. E. Bearden, and A. Labounsky, "The Most General Form of the Vector Potential in Electrodynamics," Foundations of Physics Letters, 15(3), June 2002, p. 245-261.

For a rigorous proof that removing Lorentz's 1892 arbitrary symmetrization of the Heaviside-Maxwell equations does indeed provide usable energy currents from the vacuum, see M. W. Evans et al., “Classical Electrodynamics without the Lorentz Condition: Extracting Energy from the Vacuum,” Physica Scripta, Vol. 61, 2000, p. 513-517.

To see the horrible falsities (as pointed out by eminent scientists such as Nobelist Feynman) being taught in electrical engineering in all our universities, see my paper “Errors and Omissions in the CEM/EE Model,” available at http://www.cheniere.org/techpapers/CEM%20Errors%20-%20final%20paper%20complete%20w%20longer%20abstract4.doc . This paper was favorably reviewed by the National Science Foundation; for the NSF letter see http://www.cheniere.org/references/NSF%20letter%20Bearden.jpg .

Here is a little exercise that is revealing to think about:

Take a common permanent magnet and sit it on the bench. Lay an electret across it so the E-field of the electret is at right angles to the H-field of the magnet. Then by the ordinary Poynting theory already accepted and contained in every basic electrical engineering textbook, that silly thing sits there and continuously pours out a steady Poynting stream of real electromagnetic energy flow S, given by $S = E \times H$.

The CEM/EE folks just shrug and walk away from that embarrassing problem. A typical comment is one by Buchwald:

"[Poynting's result] implies that a charged capacitor in a constant magnetic field which is not parallel to the electric field is the seat of energy flows even though all macroscopic phenomena are static." [Jed Z. Buchwald, From Maxwell to Microphysics, University of Chicago Press, Chicago and London, 1985, p. 44].

He states it, but does not pursue its implications at all.

Scientists such as Van Flandern do point out that a so-called “static” electromagnetic field is actually a nonequilibrum steady state system, comprised of internal parts in continuous and steady motion. Quoting Van Flandern:

“To retain causality, we must distinguish two distinct meanings of the term ‘static’. One meaning is unchanging in the sense of no moving parts. The other meaning is sameness from moment to moment by continual replacement of all moving parts. We can visualize this difference by thinking of a waterfall. A frozen waterfall is static in the first sense, and a flowing waterfall is static in the second sense. Both are essentially the same at every moment, yet the latter has moving parts capable of transferring momentum, and is made of entities that propagate. …So are … fields for a rigid, stationary source frozen, or are they continually regenerated? Causality seems to require the latter.” [Tom Van Flandern, “The speed of gravity – What the experiments say,” Physics Letters A, Vol. 250, Dec. 21, 1998, p. 8-9].

So there is no problem at all in establishing as large a continual free electromagnetic energy flow as one wishes. Anywhere, anytime. Simply make a dipole, or crossed E and H dipoles, then leave it alone. As Nobelist Lee pointed out, when you have a broken symmetry then something virtual has become observable. In other words, any electromagnetic broken symmetry can and does absorb virtual energy from the vacuum, integrate it coherently into quantum sized particles (photons), and emit those real, observable photons at light speed in all directions. This process – the solution to the long-neglected "source charge problem" – is what produces the steady-state or "static" electromagnetic fields. Such fields are actually continuous, free flows of real, usable electromagnetic energy.

The entire "free energy from the vacuum" problem is simply this: Given incredible "free electromagnetic energy wind" available and automatically provided from every electromagnetic broken symmetry (dipolarity) in the universe, how does one build a proper asymmetric "windmill" to intercept and collect some of that real, free, continuous "electromagnetic energy wind energy" and then separately dissipate it in its loads to power them? All our electrical engineers think, design, and build only symmetrical windmills, which use half their freely collected electromagnetic energy to do nothing but destroy their own source dipolarity furnishing the free wind! The other half is used (in the forward emf region) to power the losses and loads of the external circuit.

So half the "freely collected" energy is normally used (in the EE's symmetrical circuits and systems) to destroy the wind source itself, and the other half is used to power the external loads and losses. Well, to keep the wind flowing, we have to keep "restoring" the internal dipolarity (broken symmetry) of the generator as fast as it is being destroyed. That is what "cranking the shaft of the generator" actually accomplishes; it doesn't send a single joule of energy directly out onto the external circuit or power line! Note that the rigorous definition of work is the change of form of energy. When we crank the generator shaft, we input mechanical energy, which once the generator rotates is changed (courtesy of Nikola Tesla!) into rotating magnetic field energy inside the generator itself. In turn, this rotating magnetic field energy is dissipated totally inside the generator, to force opposite charges apart and thus to produce that magic source dipolarity with its broken symmetry. The broken symmetry of this internal dipolarity then absorbs virtual state energy from the seething virtual state vacuum, and transforms it to real, observable photons (real, usable electromagnetic energy) which it continually pours out. It is this stream of real electromagnetic energy flow that pours from the terminals of the generator and along through space outside the external conductors.

A tiny portion of this giant energy flow (the Poynting component) is diverged into the conductors to "power up the electrons" and thus power the circuit. A huge curled giant Heaviside component remains, but (in any special relativistic situation) is not diverged, does not interact, and does nothing.

But the generator actually outputs more than a trillion times as much total electromagnetic energy flow (in both the feeble Poynting electromagnetic energy flow component and the accompanying giant Heaviside curled electromagnetic energy flow component) as the mechanical energy that we physically input to the shaft of the generator.

The knowledge of Heaviside's giant usually-nondiverged energy flow component is what Morgan also had "scourged" from the theory by Lorentz in 1900, so that all the future electrical engineers would think that they only produce the diverged Poynting component of energy flow and nothing else.

Very good modern classical electrodynamicists continue to ignore any and all curled energy flow components accompanying the Poynting linear flow component. Quoting Jackson :

"...the Poynting vector is arbitrary to the extent that the curl of any vector field can be added to it. Such an added term can, however, have no physical consequences. Hence it is customary to make the specific choice …" [J. D. Jackson, Classical Electrodynamics, Second Edition, Wiley, 1975, p. 237].

Let us comment: Jackson is quite correct so long as the situation remains special relativistic. In that case, vector analysis holds and the divergence of the curl is zero. The curled giant energy flow component thus does not diverge or interact with anything.

But if the situation is deliberately made general relativistic or deliberately involves a properly synchronized general relativistic operation, then Jackson's statement is false. In that case, a bit of that giant curled energy flow component does diverge after all, and comes into the circuit to help power it. In optical physics, the negative resonance absorption of the medium (NRAM) phenomenon (released by the Russians in 1967) is just such a process, though that is completely unknown to our optical physicists. But in the optimized narrow frequency experiments using laser input energy, the COP is actually COP = 18 as experimentally measured every year in all leading optical physics groups worldwide.

But none of them are allowed to say "excess emission", but are force to use the deliberately mind-numbing phrase "negative absorption". Anyway, we proposed using that NRAM process to build heat amplifiers in steam boilers, so that with closed positive feedback the steam boiler can be made self-powering. This would immediately and dramatically lower the consumption of coal, nuclear fuel rods, natural gas, etc. in most of our electrical power plants already built and deployed. For a crude little paper on it, see Thomas E. Bearden and Kenneth D. Moore, "Increasing the Coefficient of Performance of Electromagnetic Power Systems by Extracting and Using Excess EM Energy from the Heaviside Energy Flow Component". PPA, filed and obtained in Oct. 2005. Now released into public domain and freely given away to the public domain. It is available at http://www.cheniere.org/techpapers/PPA%20Increasing%20COP%20by%20addnl%20extractn%20from%20flow1a.DOC .

As you can see, our electrical engineers are deliberately (and unknowingly) trained to only build symmetrical systems that destroy their free energy wind input faster than they use some of it to power the loads, and that do not do anything "general relativistic" so that a part of that now-unaccounted giant curled Heaviside electromagnetic energy component also gets diverged (and thereby converted into an extra Poynting energy component). In short, our own electrical engineers, professors, and departments self-enforce COP<1.0 performance and are thereby directly responsible for the world energy crisis, giant pollution of the biosphere, and the deaths of hundreds of millions of impoverished peoples world wide!

The thing is this: Our scientific community should fund and permit the bright young theoreticians and bright young professors to tangle with the technical problem of how to go about building asymmetrical interception and powering systems, once they easily assemble a free electromagnetic energy wind source for furnishing the input energy freely from the vacuum. Let them first remove the diabolical Lorentz symmetrization from their present Heaviside equations, and then ponder how to then build a nice "asymmetric windmill" that will intercept and collect some of that freely flowing electromagnetic energy, and will separately use (dissipate) it to power the external loads without disturbing the "crossed dipoles and their broken symmetry".

Comment by Gary Vesperman: Was John Pierpont Morgan really that sharp a bean-counter?!! In spite of his demonstrated ruthlessness and his exploitation of the genius Nikola Tesla, we would have to give him credit for his conjunction of acute business acumen with his not inconsequential understanding of physics. Morgan left a legacy of energy invention suppression that endures to this day.

Frank Richardson: Magnetic Electrical Generator and Bladeless Steam Turbine

As told to Gary Vesperman by Frank Richardson, during the 1970's four Nevada Test Site (NTS) technicians helped Frank Richardson, an NTS electrician, invent a magnet-based electrical generator that required no input power and also a bladeless Tesla-type steam turbine.

Richardson's "Electromagnetic Convertor with Stationary Variable-Reluctance Members" (US Patent No. 4,077,001) uses two pairs of electromagnets to warp a permanent magnet's magnetic fields back and forth across output field coils to induce a DC output voltage. Dr. Thomas Bearden's motionless electromagnetic generator (see above) is based on the same principle.

The bladeless steam turbine has a closed-loop cycle that Richardson claimed is far more efficient than the electric motor in terms of converting electrical energy into rotational energy for application to a vehicle's drive wheels. The water is heated with radio frequencies like a microwave oven into steam that is then forced through two disks in sequence. The electricity for the water heater came from the generator.

The two disks are perforated in such a manner as to prevent cavitation (bubbles) even at high rotational velocity. Since steam offers a 1,000-to-1 expansion ratio compared with gasoline's expansion ratio of approximately 300 to 1, the turbine is extremely powerful. An 18-inch diameter prototype's output power was measured at approximately 1,000 horsepower.

A Volkswagen Beetle was outfitted with these inventions and driven around without energy input.

Some people tried to steal these two inventions. Two of the technicians died under suspicious circumstances, and Richardson had to go into hiding until his recent death. It is Gary Vesperman's understanding that the black helicopter people might have had nothing to do with this situation; just greed.

Gary Vesperman (Reporter): Energy Inventors are Buzzed by Black Helicopters

A few years ago one summer, an energy inventor's house was buzzed twice by a black helicopter. He said they appeared to be an older Hughes model painted black and with no markings. He asked a friend who is an air traffic controller at the local airport. His friend reported no radar sightings. One of the buzzings was witnessed by dozens of people although the inventor himself wasn't home. (Gary Vesperman has since then come across an article in his zero point energy literature which claims that the radar-absorbing coating on black helicopters and also black Stealth fighters and B-2 Stealth bombers is depleted uranium.)

Also about that time the energy inventor and some other people narrowly escaped a flip and crash in a private plane which had a cut on a tire. The cut was then hidden by rolling the plane.

Las Vegas UFO buff Tym Schofield was driving around the desert one year when some black helicopters swooped low over his car and gave him a really good scare. He was on his way home after appearing on a radio talk show.

A female Las Vegas resident met a former black helicopter pilot at a 1995 Christmas party. The pilot had become so disgusted he quit. Subsequently, the driver of a car attempted to run over the ex-pilot and killed his wife instead. Gary Vesperman tried to locate the pilot so he could interview him but was unsuccessful.

Bob Dratch, inventor of the thorium powerpack (see below), reports back in the late 90's during one of the winters he had picked up his son from the bus-stop. He went past his old machine shop which he had in an old farm house and continued up the hill to his house. As Dratch crested the hill top he noticed hovering below the ridgeline out of sight of "radar" from the flatlands a black helicopter with something that looked like a high-powered "shotgun-like" antenna on the nose. The copter was totally silent, black, numberless and pointing this "thing" at his shop. After having dropped off his child at home he went back down to his shop and found all his computers were OFF line, and not booting any more. Had his equipment just gotten zapped with an electromagnetic pulse? Was he being snooped on long range? Who knows?

The town was about 10 miles due west of Golden Colorado, and the mountain they were nearest is called Mount Tom. They were between Mount Tom and Dratch's shop, very close to the hilltop closest to him (within about 500 feet), but about 8 miles SE of the large mountain (Mount Tom), just clearing the hill's ridge and below tree line. He would not have seen them at his shop as at that altitude they were below tree line, but hovering silently. When he crested the hill that was when he was above tree line for a moment, and saw them there. He no longer has his shop at the old location as a few years after that all the water dried up in the wells. He supposes that is just a coincidence.

The black choppers now and then make a point of buzzing him, and/or hovering. But Dratch hasn't had any ground attacks – just this aerial stuff. Generally they tend to appear when he runs tests...

(The two black helicopter stories below were excerpted with permission from Erik Masen's article SUPPRESSION FROM HIGHER UP Inventors Beware! The Deadly Campaign Against Free-energy Devices, *Electrifying Times*, Vol. 8 No. 3 and also in http://www.electrifyingtimes.com/erik_masen_suppression.html.)

At the International Tesla Society conference in 1993, a videotape of an advanced generator utilizing tachyon waves was presented without the inventor's permission. This generator not only produces excess energy, but also exhibits time-warping characteristics. The tape was shown on a Friday afternoon, 3,000 miles from the inventor's home.

The very next day, U.S. Government's Federal Bureau of Investigation (FBI) and Bureau of Alcohol, Tobacco and Firearms (ATE) agents knocked on the inventor's door wanting to see the device. He politely told them no.

The following day, a black helicopter hovered above his house taking pictures of the inside. (These black helicopters and even some satellites apparently now have the capability of photographing every item inside a building.)

On a recent morning talk show featuring the U-2 spy plane, it was revealed that the plane's audio receivers are so sensitive they can pick up ground-level conversations from an altitude of 70,000 feet.

(The black helicopter stories below were told to Gary Vesperman at the 1997 International Tesla Society Symposium in Colorado Springs, Colorado by health physicist John W. Moreland, Ph.D.,1251 Smith Thompson Road, Bethpage, TN 37022 (near Nashville); voice 615-888-3428. Moreland publishes and sells 34 engineering and physics textbooks – mostly old books that he thought ought to be republished and made available. He has accumulated several yards of files on unconventional energy devices.)

It is reportedly possible to approach within a half-mile of a base east of Nashville, Tennessee which houses at least 100 black unmarked helicopters, some black unmarked C-130 transport airplanes, and black unmarked jeeps.

A county commissioner, whose jurisdiction includes Nashville and who owns a farm, became upset with black helicopters flying over his farm at night scaring and scattering his animals. He complained to Congress, the Department of Transportation, Federal Aviation Agency, etc. without satisfaction.

Some years ago, an inventor in another city had his house buzzed a few times by black helicopters. One night during a particularly aggravating buzzing, the inventor shot down the black helicopter which killed both pilots and demolished his house. He was arrested and charged with murder. At a hearing, his lawyer held up a Washington Post newspaper headline "Federal Government Claims Black Helicopters Don't Exist". The charges were dropped because black helicopters don't exist.

So afterwards when another inventor in early June one year at 2 a.m. had his one-story house buzzed by a black helicopter 3 feet above his roof, he went outside with a flashlight and a pistol. He aimed the light at the pilot, ran the light along the fuselage and after finding no identifying numbers, told the pilot he doesn't exist. He then disabled the tail rotor with his pistol. (He didn't want to injure the two pilots.) The helicopter took off fishtailing from side to side. Since then he hasn't been visited by black helicopters.

Black humor? It could be supposed that these two shooting incidents prove that it must conveniently now be legal open season on black unmarked helicopters. Keep in mind though that their pilots are only employees of the U.S. Government (see http://www.nogw.com/shadow.html) who are being paid to spy on, harass and buzz targeted American citizens, particularly energy inventors who potentially are able to put large energy industries out of business. Some of these black helicopter pilots may even be wondering about why they are participating in suppression of new energy inventions.

Erik Masen, in his article "Suppression of Quantum Leap Inventors", *Electrifying Times*, 2007, Vol. 10, No. 2, wrote that some say that black helicopters are part of the Bureau of Alcohol, Firearms, and Tobacco which operates under the U.S. Treasury Department, which in turn operates with the U.S. Federal Reserve, which is a private corporation, which operates with the World Bank, over which the U.S. Government apparently has no jurisdiction. Thus, the black helicopters can do as they please.

Gary Vesperman (Reporter): Shielding Over-Unity Power Converters

A typical radio wave that is radiated out of an antenna comprises of transverse waves of electromagnetic energy. These transverse radio waves oscillate perpendicularly to the axis along which they are traveling.

The zero point energy field is an immensely energetic medium, omnipresent throughout the universe, of random electromagnetic waves with frequencies ranging from near zero to frequencies so extremely high as to be undetectable.

An over-unity power converter generates more output power than the input power it needs to operate. Hence its ratio of output power to input power is greater than one. That is, it is operating at "over-unity". Its leftover output power is thus available to do useful work for "free"; hence the popular term "free energy" machine.

Some types of over-unity power converters are designed to extract energy from the zero point energy field. What's interesting is that longitudinal waves of electromagnetic energy are emitted during the energy extraction process. That is, these longitudinal electromagnetic waves oscillate along the axis of their travel, not perpendicular to the axis like transverse radio waves.

Detecting these longitudinal electromagnetic waves requires special sophisticated instruments. The U.S. Government maintains a network of such instruments in orbiting satellites to monitor the entire earth for these signals. (This same network is also employed to usefully detect, locate by triangulation, and report lightning bolts in real-time which helps to justify the network's enormous expense.)

If a longitudinal electromagnetic signal is picked up, it is assumed that an inventor is experimenting with a working over-unity power converter or generator. The location of the device is triangulated, and the inventor is then "visited", liquidated or whatever by energy invention suppression hit squads in order to safeguard markets for gasoline and metered centrally generated electricity.

Copper-lined Faraday cages, normally used for shielding radio waves, are not adequate for blocking these signals from over-unity converters of zero point energy. One experimenter has suggested using bismuth.

The all-seeing Big Brother effectiveness of the U.S. Government's zero point energy extraction detecting and tracking network has been demonstrated by one zero point energy experimenter's complaint:

"I have not been able to locate any type of material that will shield this type of energy. The best advice is to work underground and operate only for brief periods of time 10 to 15 minutes at random times. Also heavy cloud cover, wind, rain and other thunderstorms are good for masking your experiments.

I had black choppers and power company trucks crawling all over me within 15 minutes when I discovered an over-unity effect in my shop. I think they would have been at my door if I had not shut the unit off when I did. They changed every ground and insulator on all the power poles for miles around my location looking for the source of the energy they had detected."

This writer, Gary Vesperman, pieced together the above from various sources. David G. Yurth questions its accuracy per his July 7, 2006 email below.

Gary: You may want to consider the following with respect to your descriptions of both radio waves and the ZPE field phenomena.

Radio waves are indeed waves of electromagnetic energy. In some cases they are transverse, and in some cases they oscillate perpendicular to the axis along which they are propagated. But in the case of the CTHA antenna, for example, which is really a magnetic resonance oscillating antenna device, the wave form can be either spherical or hemispherical. In some cases, as in the case of the devices we demonstrated several years ago, the wave form can be narrowed to as little as .1 degree second in a semi-hemispherical form.

In most cases, RF waves radiate in a straight line from the propagation point – that is why, for example, RF devices used during the day have a range that is limited to less than 22 miles [on flat topology], unless repeater towers are provided at key points along the horizon. However, with the CTHA device, particularly when it is used on the surface of large bodies of water, and more particularly when used on the surface of salt water, the hemispherical wave form coheres to the surface of the water and is attenuated at only about 10% the normal rate of RF signals propagated through the air. In addition, because of the nature of water itself, extra low frequency radio waves are the only RF waves that can be relied on to propagate a signal through any appreciable distance of water. However, with the CTHA, this is not true. These devices have been shown to send RF signals through the water at much higher [VHF and UHF] frequencies than any other known devices, with minimal attenuation and virtually no distortion. Why they operate in this way is not known to science in general and to the US Navy in particular.

My notion about this is that the CTHA configuration propagates non-local field effects as well as linear ones. Because the non-local effects are neither understood nor optimized in the current technologies, what we observe is the effect of a non-linear wave propagation device used in applications which are typically linear. The Y-Bias manuscript explains how this works and why it is important.

Finally, the zero point is probably not *an immensely energetic medium, omnipresent throughout the universe, of random electromagnetic waves with frequencies ranging from near zero to frequencies so extremely high as to be undetectable.*

Rather, as the Y-Bias research suggests, the zero point is the interface between the physical vacuum and the 4-D physical universe we live in. It is not something extrinsic to the physical world we observe but is utterly intrinsic at the finest scales of organization. This insight is the reason the Y-Bias information is so important. What it means, for example, is that neither Tom Bearden's MEG nor Correa's orgone generator is really operating at the zero point or anywhere near it. Rather, what they are doing is tapping the quantum pump that operates within the organizational structure of all matter and energy at the fourth scale of development to liberate an infinite supply of electrons via one biased voltage schema or another.

What the Heavyside equations and Whittaker's formulation make clear [quaternions] is that every variety of physical material exhibits a quantum oscillating frequency. Modern science has only just begun to understand the importance of this concept so the literature is not yet replete with references to the quantum frequencies of all the elements and their isotopes. Nevertheless, when the quantum frequency of any material can be excited by an outside force which causes it to operate in a narrowly defined local in terms of a harmonic resonance, the dynamic properties of self-organizing criticality kick in to produce exponentially more powerful internal oscillations than would normally occur within the sub-atomic structure of the material.

We know this because when carefully prepared isotopes of certain rare earth materials are intercalated within the crystalline lattice structure of conductive thin films, and then exposed to permanent magnetic fields, the atoms of the isotope produce prodigious amounts of electrical voltage and current continuously, without consuming either the atoms themselves nor the materials within which the atoms are held in stasis in the lattice itself.

We have a prototype engine which is in its third generation now that has been operating continuously for 76 days. The data recorder shows that the power output has remained steady day and night throughout the test period. The mass of the material has not changed one iota in that time and neither has the composition of the substrate, the crystalline material or the original atomic isotopes themselves.

Bearden solved the source charge problem partially when he demonstrated that mass is organized and deconstructed at the zero point with a quantum frequency that absorbs a virtual photon from the physical vacuum and then liberates a real photon when two virtual charge ensembles combine to form the organized datum which is characterized at the second scale of organization. This operation goes on continuously within the heart of every iota of material found everywhere in the universe – it is this fact, born out by the Y-Bias analysis, that gives the lie to the Big Bang Theory. All primary particles were not created at the instant of the Big Bang – instead, everything about the cosmos is being recreated at a quantum rate all the time, at every address in the cosmos, continuously, as part of the autopoietic nature of this physical dimension.

So when any inventor tells you he is generating transverse waves of non-local propagation when tapping the zero point, you can write that research off as fundamentally flawed because the phenomena you are referring to has nothing at all to do with the zero point. --- Dave

(This writer, Gary Vesperman, recently edited David G. Yurth's ground-breaking 153-page physics monograph "Y-Bias and Angularity©: The Dynamics of Self-Organizing Criticality from the Zero Point to Infinity". I also edited Yurth's 380-page "Seeing Past the Edge" which explores and ties together such advanced scientific topics as nuclear physics, mind-matter connection, holographic universe, and the torsion field.)

Ph.D. Electrical Engineer: Advanced Form of Plasma-Discharge Energy

An inventor and a Ph.D. electrical engineer from one of our prestigious universities had made a breakthrough on an advanced form of plasma-discharge energy. They hired a hall in a mid-sized town in the U.S. to show off their new discovery. It was an impressive demonstration.

One day, his neighbors told one of them they had seen a black helicopter hovering over his house for several hours while he was away at work. Evidently, it was photographing his technology in the basement. A black van, with windows that you couldn't see into, also staked out their lab.

After three weeks of surveillance, a S.W.A.T. team of six kicked down the lab door, and with axes, destroyed half a million dollar's worth of equipment in one-half hour. The thugs forced the inventors' faces down onto the concrete floor, and, demanding to see the nuclear source, beat the inventors' heads against the concrete until they nearly choked on their own blood. They had no search warrants, just "S.W.A.T. TEAM" printed on the backs of their brownish uniforms.

The inventors were told to cease all further development, and the apartments owned by one of the inventors were condemned. The tenants were ordered to leave, and the Ph.D. electrical engineer is still being harassed by the IRS to this day.

Gary Vesperman (Reporter): Six CIA Agents at 1996 Tesla Society Symposium

When this writer attended an International Tesla Society Symposium in Colorado Springs, Colorado in 1996, I was told that the inventor of a new type of carburetor that can triple the mileage of a car has had his social security number taken away. Also attending the convention were at least one U.S. Government's Central Intelligence Agency (CIA) agent, identified by someone standing in the registration line behind him who happened to see his identification card, and another five CIA agents.

One of the CIA agents threatened a co-inventor of an electrical generator utilizing two types of radioactive waste as he was walking up to the podium to give his speech. However, this story needs further verification.

Gary Vesperman (Reporter): US versus Japanese Support of Cold Fusion

The leading cold fusion community website is http://www.lenr-canr.org/. The site features a library of papers on Low-Energy Nuclear Reactions (LENR) – also known as cold fusion. Chemically Assisted Nuclear Reactions (CANR) is another term for this phenomenon. The site features a library of more than 500 original scientific papers in Acrobat format, reprinted with permission from the authors and publishers. The papers are linked to a bibliography of over 3,000 journal papers, news articles and books about LENR.

In Japan, inventors are treated as national heroes and are lavishly supported. The Japanese government's annual R & D budget in cold fusion had been $100 million per year (since greatly reduced). Japan has issued over 100 low-energy nuclear reaction patents. In contrast the U.S. Patent Office has so far approved only one cold fusion patent application out of 300. (This statistic is possibly out-of-date.)

Stanley Pons and Martin Fleischman: Cold Fusion

Much misrepresentation and falsification of evidence happened after Stanley Pons and Martin Fleischman announced in March 1989 that they had achieved fusion by electrochemical means. Several influential US laboratories (California Institute of Technology, Massachusetts Institute of Technology (MIT), Yale/Brookhaven) reported negative results on cold fusion that were based on shoddy experimental work and a misunderstanding of the Pons-Fleischmann claims. They gave a hostile hot fusion establishment the excuse it needed to conclude that the claims made by Pons and Fleischmann were bogus. In November 1989, a U.S. Department of Energy panel concluded the same after a shallow mock investigation of only seven months. Eugene F. Mallove, Sc.D., was the Chief Science Writer at the MIT News Office at the time. He played a part in exposing the MIT report as mistaken, possibly fraudulent, and resigned in protest over it in 1991. … It is ironic that each of these negative results were themselves the product of the kind of low-quality work of which Fleischmann and Pons were accused. The difference was that the reports said what the hot fusion community wanted to hear. This was the legacy of the 1989 ERAB report, but that legacy must now be reversed – and it will be, however long that takes.

Dr. Mallove later founded and edited/published Infinite Energy magazine until in May 16, 2005 he was robbed and bludgeoned to death by a pair of pathetic drug addicts. The 1999 Issue 24 of Infinite Energy, in its 57-page special report titled "MIT and Cold Fusion: A Special Report", extensively documented that MIT violated the trust of its donors, employees and the public in the integrity of its scientific research into cold fusion.

In addition to suppressing cold fusion, MIT has also suppressed its solid-state lithium-ion roll-to-roll battery patents which would increase the efficiency and performance and lower the cost of electric and hybrid vehicles. See Remy Chevalier's report below on NiMH and solid-state lithium-ion batteries.

Chevalier does ask "Is it because MIT is cashing checks from the Rockefeller Bros. and the Ford Foundation?" So he may be hinting that, possibly based on inside information, MIT's suppression of cold fusion and its battery patents is due to its secret protection of the oil/auto monopoly.

Most people, including physicists, continue to be unaware that low-energy nuclear reactions are real, and have been verified in hundreds of experiments throughout the 1990s. In February 2002, the Space and Naval Warfare Systems Center of the United State Navy in San Diego released a 310-page report titled "Thermal and Nuclear Aspects of the Pd/D_2O System" that discusses the overwhelming experimental evidence that the cold fusion effect indeed exists. Dr. Frank E. Gordon, the head of the center's Navigation and Applied Sciences Department, writes in the foreword:

That "cold fusion" continues to be ignored by the scientific establishment, and, to add insult to injury, is being used synonymously with "bad science", usually in such expressions as "the cold fusion debacle", constitutes one of the greatest scientific scandals in human history, and a human tragedy. While wars over oil are being fought, a potential source of energy that could solve humanity's energy problems for all eternity is being ignored by all but a small community of researchers. At the same time, the dead-end "hot fusion" program continues to receive billions of dollars in public funds. If there is a scandal associated with cold fusion, this is it. (Source: "The Suppression of Inconvenient Facts in Physics – The Cold Fusion Scandal - Rochus Börner, Ph.D., *Cold Fusion Times*, Vol 12 No 2, August 2005. See also http://www.std.com/~mica/cft.html. Excerpted from "The Suppression of Inconvenient Facts in Physics" http://www.suppressedscience.net/physics.html. This paper compiles instances of suppression of honest examination of flaws in some of the major theories held inviolable by Western science bureaucracies. In addition to the supposed impossibility of cold fusion and low-energy transmutation, mainstream Western physicists hotly defend, in spite of "inconvenient facts in physics", relativity theory, the constancy of the speed of light, absence of signals traveling faster than the speed of light, quantum theory, big bang cosmology, impossibility of anti-gravity, commercial hot fusion, and the second law of thermodynamics.)

Mitchell Swartz: U.S. Patent Office Blocks Cold Fusion Patents

Mitchell R. Swartz, MD, Sc.D, has four electrical engineering degrees from Massachusetts Institute of Technology. He is an engineer and physician who has been inventing for decades, and has received many patents. Two of his previous patent applications went to the Board of Patent Appeals and were subsequently issued.

Yet, even with that extensive experience, never before had Swartz seen such misbehavior, systematic prejudice, conspiracy and disingenuous statements as has been demonstrated by the U.S. Patent Office regarding several of his patent applications involving lattice-assisted nuclear reactions, and devices which measure conditions leading to such reactions (often referred to as "cold fusion").

Regarding cold fusion, it is a real science, and Swartz and his fellow researchers have conducted solid, meticulous research for almost two decades. He recently gave lectures to the Defense Threat Reduction Agency and the Naval Research Laboratory, both of which recognized the utility of his work in cold fusion. No one from either erudite group (more than a hundred scientists and engineers) gave even one iota of the disparagement which, in stark contrast, has been doled out from the Patent Office without foundation on a weekly or monthly basis continually for more than two decades. Along with the disparagement, the Patent Office has been disingenuous to the federal courts and the Board of Patent Appeals, and has demonstrated not only a conflict of interest but also salient improper behavior.

The egregious behavior of the Patent Office with respect to cold fusion patent applications has ignored the U.S. Constitution and Congress' directive to "encourage progress and to encourage ingenuity with patentable statutory subject matter to include anything under the sun that is made by man". Supporting said Congressional directive, attention is directed to the fact that issuing a patent would normally be mandated because these processes involve the loading of heavy hydrogen into palladium and its generation to form helium and heat. Such transformation has been declared patentable by the federal courts.

The Patent Office's use of a two-tiered system to chronically discriminate against cold fusion violates many federal laws. Out of more than 300 cold fusion patent applications, the Patent Office has issued only ONE patent – and that single patent is believed to be the Patent Office's accident/mistake.

To illustrate exactly how the Patent Office methodically destroys cold fusion patent applications (and probably many other energy patent applications), Swartz describes two patent applications of his which had nothing to do with the cold fusion process directly, but were in fact methods of improving technologies of measuring loading of hydrogen into metals and of measuring heat production (calorimetry). They both just happen to be useful to cold fusion. The mere hint of application to cold fusion at the Patent Office was enough to warrant (as they see it) harassment, discrimination, and obvious deviation from normal procedure.

The Patent Office concocted several false reasons to scuttle his applications. For example, the Patent Office falsely claimed that Swartz had purported that there was "excess heat" in the invention of a method for improving the measurement of loading of hydrogen into metal. However, those two words were never even mentioned in the patent application. Swartz pointed out to the Patent Office their error, who then studiously ignored his Affidavit – timely filed and supported with many other Declarations supporting him.

The Patent Office's Decision to deny the calorimetry patent application refers to "cold fusion" eighty-six (86) times by inaccurately substituting the words "cold fusion" for the words and phrases "heat production", "activity", "electric power drive", "thermally monitoring", "thermal output", "optimum drive condition", and even for "multiring calorimeter".

Showing systematically hostile, abusive behavior to Swartz and his patent applications, the Patent Office would frequently ignore and not even officially log exhibits and declarations. For example, the Patent Office denied the validity and workability of his two inventions in spite of substantial peer-reviewed documentation of careful measured, professionally witnessed experimental results of actually working prototypes. The Patent Office was able to back up such denials simply by not bothering to log pertinent documents.

To avoid responding to what was filed which is actually required by law and custom, the Patent Office brazenly relied upon reference to art irrelevant to the actual specifications and claims. Responding to the initial denial of his patent application for a vibrating electrode for measuring the loading of hydrogen into metals, Swartz appealed to the Board of Patent Appeal. In their decision to again deny his patent application, the Board's Decision incredibly included only two (2) sentences pertaining to the actual invention. The remainder of the Decision's 28 pages comprised of a stale, totally irrelevant carbon copy attack on cold fusion and Drs. Pons and Fleischmann. This has been one of the Patent Office's typical distraction processes.

The Patent Office has routinely made many false statements in federal documents. For example, they falsely stated once "there is no disclosure..." involving temperature, and again for voltage. Yet the applications do discuss temperature or voltage, and Swartz in his July 30, 2007 letter to Gary Vesperman cited the actual pages where these parameters were discussed more than once.

These two inventions are only two of more than a dozen patent applications Swartz submitted to the Patent Office where the response has been disingenuousness, obstruction, and failure by the Patent Office to abide by a uniform standard consistent with their own rules.

In summary, it is important to remember that this is not an issue of a difference of opinion; it is about a two-tiered system to enable chronic discrimination (suppression) against cold fusion and probably many other energy inventions. It is about an agency of the U.S. Government thumbing their noses at the U.S. Constitution, at the U.S. Congress, at American security, and at American citizens. It is about an agency "losing" checks, "losing" pleadings, "losing" Exhibits, and failing to answer Declarations and pleadings over seventeen years.

The Patent Office remains quite comfortable and shameless as it viciously ignores Article I, Section 8 of the U.S. Constitution, the explicit directives of the U.S. Congress which funds it, and even its own rules. It is egregious and odious that some in the Patent Office use systematic disingenuity to rob inventors, and more importantly America itself of these American-crafted energy-related inventions. The cover-up of cold fusion is complete, as the applications are now transferred overseas to hurt the United States of America.

(Source: In his July 30, 2007 letter to Gary Vesperman, Mitchell Swartz backs up his allegations with specific citations of law, reference to ~140 pounds of over 300 indisputable papers submitted as evidence, legal briefs, etc. Swartz also mailed to Vesperman the August 2005 issue of *Cold Fusion Times* and a copy of a 39-page Petition to the U.S. Supreme Court for a Writ of Certiorari appealing a negative decision by the Board of Patent Appeals and Interferences. Having never before seen a U.S. Supreme Court legal document, I found the Petition fascinating to skim through. For instance, I counted 62 references to previous cases. I used to work as a technical writer preparing computer manuals for 18 Silicon Valley companies. The materials Swartz mailed to me confirm the suspicion I have had for a long time that patents demand the ultimate in technical writing.)

Robert Bass: Low-Energy Nuclear Transmutation

From: Don Quixote II <donquixote@radix.net>
To: Sir Arthur C. Clarke <blenheim@sri.lanka.net>
Date: Saturday, November 25, 2000 8:07 AM
Subject: A WARNING? My micropellet proposal to Japanese government

Have 3 people been assassinated because of the Cincinnati Group's discovery of a low-energy nuclear transmutation process that can be used, e.g., for radioactive waste remediation?

The original 14 addressees are all editors or investigative reporters

From: Bass, Robert W (IDS)
To: Adil Shamoo ; Barbara DelloRusso ; Eugene F. Mallove ; George Miley ; Hal Fox ; Jean-Francois Cazorla ; Jed Rothwell ; Jim Wilson ; Mitchell Swartz ; Pat Bailey ; Patrick Bailey ; Charles B. Stevens ; Elijah C. Boyd ; Marjorie Hecht
Cc: 'Xing-Zhong Li'
Sent: Friday, November 24, 2000 6:50 PM
Subject: My micropellet proposal to Japanese government

PREFACE: It is readily documented that the CIA and the KGB and the Mossad, etc. all have "sprays" which can be sprayed upon someone and cause him to die of apparently natural causes. One famous case occurred (not long after Chris Tinsley's death) in which Mossad agents were caught red-handed spraying a Hamas activist in Jordan, and King Hussein told the Israeli Prime Minister that if they didn't send the antidote quick there would be hell to pay; but it wasn't the Mossad which sent the antidote to Jordan, it was the CIA! (They sent a doctor from the Mayo clinic [who had been previously accused of being a collaborator with the CIA] to revive the victim.) (The "Hamas activist" was apparently Hamas' Syria-based political chief, Khaled Mashaal. As Mashaal lay dying in a Jordanian hospital, King Hussein pressured Israel to provide the antidote in return for releasing the Mossad agents. Gary Vesperman)

So much for people who say that political assassinations by democratic governments are paranoid fantasies.

Hal Fox,

Dr. Li approached me semi-publicly after the American Nuclear Society (ANS) meeting, where he heard me talk about the CG's LENT process. He said that he hadn't wanted to spoil my presentation by saying anything negative, but he wanted ME to know that he himself did NOT believe the CG claims and that he could NOT confirm the claims based on his own experience and that yet he liked me and wanted me to know "the truth." (By the way, did you know that Dr. Li has 35 Ph.D.'s working for him full-time on cold fusion in China with Chinese government support?!!)

Dr. Li said that he had gone to your lab in Utah and watched you and Dr. Jin run the experiment with a "good" gamma ray detector. However, he claims that when the thorium begins to precipitate out, the solid angle of the detector remains unchanged, but the thorium is moving out of that fixed solid angle, so that the radioactivity SEEMS to be decreasing but it is a false alarm.

He said that he took the "before & after" fluids that you gave him back to China and had them tested but with negative results. (But Li did admit that the straight-line graph I showed could not be explained by his negative assumptions and was "affirmative evidence on the side of the CG.")

Don Holloman of CG says that the 7-man team of Francesco Celani et al in Italy tested the CG LENT-1 device so thoroughly that "data reduction" took 37 volunteer undergraduates "months" to complete. In their publication they claim that they achieved both complete "radiometric balance" AND complete "chemical balance" of the before-process and after-process results.

However, Celani's boss died in midlife of alleged "natural causes". And you know that Stan Gleeson of the Cincinnati Group seemed to be perfectly well when he suddenly died at age 48 of "a stroke." George Miley told me that when at ICCF-8 he asked Celani why he didn't follow through on this type of LENT work (which Chris Tinsley was starting in England [having emailed me about Stan's open-beaker LENT test] just before he dropped dead at age ~50 of "natural causes"), the reply of Celani was: "THREE PEOPLE have died, and I don't want to be the fourth!" George Miley thought that Celani was talking about radiation-sickness danger, but that is not what Celani has in mind! The proof that Celani is open to conspiracy theories is that he is on the masthead of the LaRouche magazine and *they* don't merely *suspect* conspiracy, they have been *jailed* by a U.S. Government conspiracy!

Lawrence Hecht shook my hand at the American Nuclear Society meeting after having just got out on parole after 5 years of a multi-decades sentence for "selling securities without a license" which was not [even] a crime in VA when he sold "political loans" to LaRouche supporters but [despite that] the Secretary of State of VA (who 2 days later was made a Judge as payoff for her cooperation) after studying the matter for 2 weeks decided that Political Loans are indeed 'securities.' (One of Hecht's colleagues is still in jail [illegally] with a 77-year sentence.)

The barbaric nature of a 77-year sentence for a technical infraction is self-evidently PROOF of evil at work: Pres. George Bush's stockbroker brother [Neil Bush of Silverado Bank in Colorado] was REALLY guilty of the same infraction, but he was merely *fined* $1,000 and told to "be more careful" and "don't do it again"!

I feel that my own life has been threatened in writing, indirectly by the British government. Here's why: Nobel Laureate Brian Josephson agreed to show at the historic Cavendish Lab the Mallove cold fusion video which I had hand-carried to him. Dr. Josephson even published in Gene's Infinite Energy magazine a *letter* saying he was going to show the video publicly!

But when there was a conference there and many important scientists present, suddenly Josephson reneged! He told me in writing that he had first showed the video privately to a Very Important Person (I suspect Sir Brian Pippard, J's own teacher, after whom TWO buildings at Cambridge are named!); then he, Josephson, was "convinced" by said VIP that it is "for the best" that the public be "allowed to continue to believe" that the whole CF/LENR thing was a delusion!! I tried to get J to say why *he* had agreed. He replied (with copies of his email to me both to Gene and to Yeong Kim at Purdue) that it was for reasons of military security; "they" are afraid that terrorists or rogue nations will learn how to make vest-pocket H-bombs (This is why physicist Fred Zimmerman of the US State Dept. is helping Park with his campaign to outlaw cold fusion meetings.).

When I replied to J that my own theory of deuterium crystals could be used to make "fusion micro-pellets" or "micro-bombs" and that I had sent a copy of my proposal to the Japanese government before they terminated their NHE program, J replied to me that I had better "keep your bright ideas to yourself".

In case I pass away prematurely of "natural causes" I am going to copy the preceding paragraph and send a copy to Gene Mallove and include below a copy of my "microbomb" proposal to the Japanese government. My MSD "bright idea" which J says I should keep to myself has been spread all over the world by Internet since late 1997. So it's too late to suppress the idea by suppressing me.

Best personal regards,
Bob

Dr. Bass is an unusually innovative physicist. Hot fusion requires millions of volts or the equivalent. Hal Fox's cold fusion apparatus requires almost 5,000 volts. Bass's process only takes 17.5 volts to ignite!

Bob Dratch: Thorium Powerpack

Bob Dratch's thorium powerpack would generate electricity at approximately one-tenth of the cost of current methods of producing electricity. Thorium is sufficiently abundant that the entire planet can be powered for millennia. After ten years of continuous operation, a trace amount of U-233 is produced. U-233 recovery to re-purify the thorium is easily accomplished. Thorium thus lasts a long time when recycled and consequently is a very efficient energy source. After extraction from ore, thorium does not require energy-intensive enrichment as is the case with uranium.

A thorium-powered reactor is inherently safe. It doesn't run the risk of "meltdown" or explosion nor can even a dirty bomb be created. Its nuclear reaction simply stops when its neutron exciter is turned off.

The simplest and smallest "table top-sized " neutron exciter design is something close to the size of a 4-D cell flashlight, and starts at about 500-kilovolt neutron output. In fact this smallest most cost-effective system can run off 4 D cells for its power.

A thorium powerpack's neutron excitor does not use radioactive flux components as conventionally done for portable systems. Instead it relies on Dratch's invention of a novel method of resonant phonon pair cleavage using specifically designed nuclear lattice holo-forms (holographic waveforms) to induce neutron imbalance in a host atom where the host atom then attempts to establish "balance" through the liberation of neutrons. Dratch demonstrated the first model of this novel design back in 1966.

Commercial thorium powerpacks can be developed with 50 or 100 kilowatts of output for home use, and up to 1 megawatt for industrial use. They actually are "power amplifiers" with power outputs of 60 times over input power. Maintenance would be minimal.

Predictably, Dratch complains of harassment and even death threats for nearly three decades. He and his family do not enjoy any peace or security, and the police and district attorneys are allowing the threats to continue. That is what really stinks. It seems like there is more than meets the eye behind the scenes going on.

The same death threats and suppression are applying to every piece of technology Dratch has been working on, not just the thorium system. The thorium system has the most impact he believes to the cartels. Dratch had one small section on cold-fusion, which he had published before Pons et al did theirs, and again it used properly shaped sonic fields to do the separation. The scanning system was the basis again for obtaining the proper waveform patterns.

Dratch supposes his problems appeared after he demonstrated his inventions at the Global Sciences Conference and during his workshops since the late 1980's. He has some ideas about who the perpetrators are on the international scene, but nothing really firm. It does tie into Russia and the Middle East. At one point during an early workshop there was a Chinese scientist attending, who worked for the Chinese government and identified himself as such.

To develop his driving patterns for the neutron generation function Dratch uses his scanning system which seemed to have been the initial crux of where the recent bout of suppression started (that was pioneered in 1985, developed by 1988, and in full use by 1990).

Dratch unfortunately has a few more stories about being harassed and death threatened to him and his family by stalkers trying to get proprietary technologies. One stalker has been arrested and taken off his property. The stalkers got away without being brought to justice. The courts instead wanted to cite Dratch in contempt for dare showing that the stalkers were harassing and threatening him. Since that time back in 1992 the same stalking has gone on; there has been email and phone harassment; and the DA's office and police don't do a thing.

Dratch writes about his technologies on his website http://www.bob-dratch.org. Among the topics Dratch covers are energy stuff, anti-gravity stuff and consciousness altering stuff.

The earliest suppression was when Dratch’s patent application was stolen out of the patent examiners’ room and handed off to cronies to develop and exploit. Dratch was the one who designed the equations and concept of the Global Positioning System (GPS) – that was back in the very early 1970's. As best as Dratch can determine the Department of Defense was who the information he submitted at the Patent Office was directed to. That loss and damages is insurmountable to him. He has proof that his equations which were submitted at that time during filing are the same equations used to this day for the GPS equation. Tracing the evolution of GPS will reveal all the parties involved if one can get past the suppression and cover-ups. It then went to a private professional working for the U.S. Government for their own version of the "patent" and assigned it back to the government. In the early 1970's Dratch was offered $150K by them to sell out to them. He refused saying this is worth billions. Little did he know it was worth trillions.

In the mid-1980's Dratch designed a bio-sensory system that seemed quite capable of sampling fields and generating data signatures making up that object scanned. He continued to evolve the technology. It took on many forms. In about early 2001, he was contacted by the U.S. Air Force to modify that system to locate underground unexploded ordinance. The USAF got at his expense about $180K worth of consulting and demonstrations doing a bench test showing that his technology would work. They promised a series of further steps leading to contracts. They then disappeared after they apparently felt they had enough "proof" that the concept works. Dratch subsequently was told that they had handed over the research he did to a professor in Denver who to this day still hasn't solved the missing pieces that they weren't able to figure out.

After having given a demonstration of the sensory technology in the early 1990's Dratch was stalked, harassed, and death threats were made to him and his family to the tune of "Give them the technology or else". At one point two of the stalkers came on his property armed with knives and were trying to either kill him or his family, to carry out their threat. The sheriff came and hauled them off. When the trial came up, the judge let them WALK out free with no penalty; just a slap saying don't bother Mr. Dratch again. The judge threatened Dratch with contempt of court for having even brought this to his attention. That was in 1992. Since then Dratch has been regularly harassed and continually threatened. The police still refuse to go after the stalker and threatener. They are using extortion now as the current level of threat. Dratch has been to the DA's office of two states, and been in contact with numbers of police officers to no avail. The threats and harassment continues to this day including making complaints to the phone company who do nothing to stop such when they use the telephones.

Over the last two years Dratch has been working to develop a very unique and powerful handheld and truck-mounted sensor capable of discovering "Saddam's weapons of mass destruction" as well as many other chemical and biological weapons systems. Providing assistance, a former military officer has tried to retrieve documents which were available to any contractor. But Dratch and the officer were prohibited as they aren't part of their crony system of preferred contractors. They needed specific signatures which the U.S. Government has on hand to calibrate their system to what it had to look for (the chemical agents). Having the signature isn't the formula, it is a roadmap that says contamination or a toxic situation is present. So troops and civilians are prevented from having Dratch's technology in a low-cost form.

After having spoken enough about the innovation, one of the crony groups has published that they have a working sensor based on the technology that Dratch had divulged to the former military officer, and that they are going to charge big bucks for that innovation. So that is suppression again of getting technologies out in a way where Dratch can carry out more work.

IPMS: Thorium-227 Electricity Generator

The I.N. Frantsevich Institute for Problems of Materials Science (IPMS), Kiev, Ukraine, from 1951 through 1991 secretly employed 6600 of the most brilliant theoretical physicists in the entire Soviet Union to work for nearly 50 years with complete freedom. They were able to develop whole new sciences, technologies and materials unknown in the West.

Their models of non-linear quantum mechanics, plasma physics, atomic engineering, nuclear physics and related mathematical and theoretical constructs, which made their development possible, are so unique that they challenge the validity of the most fundamental assumptions embodied in the Copenhagen Interpretation model currently held in general acceptance in the West.

For example, Western-developed particle/wave quantum mechanics is described by Einstein's $E = MC^2$. The Soviet nonlinear model of quantum mechanics is described by the formula $E = M_KV$ [Energy = Mass @ rest as a function of a mathematical constant].

Einstein's theory of relativity assumes that the speed of light is constant. However, measurements have shown that the speed of light has slowed down 7 per cent over the past two centuries. (See http://worldnetdaily.com/news/article.asp?ARTICLE_ID=39733.) Einstein's famous equation is therefore not based on the real world of peer-reviewed experimental results. Consequently the more correct Soviet model has enabled numerous technical advances not even dreamed of by Western science.

Among several energy inventions developed by the IPMS are free-standing thorium-227 isotope electric power generating plants. They can be small enough to power a single home and large enough to power whole communities. They also can operate for up to 18 years without ever requiring refueling or maintenance.

Arrangements to commercialize these useful energy inventions by joint ventures of the IPMS and more than a dozen private sector companies were repeatedly sabotaged by the U.S. Government's Defense Intelligence Agency and others. (Source: David G. Yurth, *The Anthropos Files: Tales of Quantum Physics from Another World – 2nd Edition*, 2007)

Howard Rory Johnson: Magnatron – Light-Activated Cold Fusion Magnetic Motor

During the late 1970's Howard Rory Johnson, a brilliant inventor in Elgin, Illinois, combined light-activated cold fusion with a new type of magnetic motor into a "Magnatron". His prototype Magnatron produced 525 horsepower but only weighed 475 pounds. It could propel a large truck or bus 100,000 miles on about 17 ounces of deuterium and 1.5 ounces of gallium before being recharged. This was years before either Pons and Fleischman or Dr. James Patterson entered the scene with their cold-fusion technology.

Johnson discovered the light-activated cold fusion portion of the Magnatron by accident when as he was developing a new type of electronic circuit using deuterium oxide and gallium, he noticed the two materials were producing energy on their own. He could not figure out what was triggering the energy production for some time until he finally discovered it was light.

The Magnatron's flow of deuterium (an isotope of hydrogen) is controlled by magnetic tunnels. At the point where the deuterium strikes the gallium (a heavy metal electron donor), a beam of light from a diffraction prism forces their fusion. That controlled reaction results in the fusion of two atoms forming a new atom. In the process, electricity is released, and that is what powers the magnetic motor. The Magnatron is sealed, however, so 'light' is provided from photon energy produced from coils tied directly to the motor. It is more or less a pulse-generated system.

A photon is a football-shaped particle of electromagnetic wave energy. Its energy content is a product of its frequency f and Planck's constant h. When an electron in orbit around the nucleus of an atom drops to a lower, less energetic orbit, a photon containing the energy equivalent to the electron's energy drop is emitted. This explains why light and other forms of electromagnetic energy such as gamma rays and radar are sometimes observed as particles and other times as waves. The heated filament of a light bulb is an example of photon production.

There is no way to explain, using contemporary electrical theory, how his relatively small motor could produce such tremendous horsepower. Utilizing his own new electrical-magnetic energy theory, involving a process he called "attract-attract", Johnson exploited the magnetic field. He used the top and bottom rotors in his motor. First, the top rotor attracted, released; then the bottom rotor attracted, released. The action of attraction, alternating between upper and lower magnets, used the windings to complete the attract field.

Robert Nelson's compilation of articles about the Magnatron provides much more technical detail on the Magnatron than the foregoing. (See http://www.rexresearch.com/magntron/magntron.htm.)

Johnson constructed his prototype Magnatron's 525-horsepower magnetic motor without any of the hardware that is presently used in present state-of-the-art electric motors. Conventional motors use the accepted principle of attract-repel, an energy form that doesn't utilize the magnetic field to its greatest advantage. For comparison, a typical 500-horsepower electric motor has wires exiting it that are the size of a garden hose.

The sealed self-contained Magnatron has no wires. Thus, other than the Magnatron's infrequent refueling with small amounts of deuterium and gallium, the stand-alone Magnatron uses no input power. The Magnatron's entire output power is conveyed by its magnetic motor's rotating shaft.

Fuel for the Magnatron is plentiful: deuterium is derived from water, and gallium is extracted from abundant aluminum bauxite. Commercially available pure gallium is still scarce and expensive. It may well be possible, however, to cheaply transmute another less expensive element into gallium. See Gary Vesperman's list of over two dozen methods of neutralizing radioactive waste in http://iiic.de/docs/GVComparison.htm which includes possible transmutation methods.

The Magnatron uses no fossil fuel in its operation, and it emits no pollution. The magnetic motor's RPM is 8,000 with a gear ratio of 2:1. Lubrication for the sealed motor is synthetic motor oil which does not need changing and does not need a filter, because foreign materials such as carbon and varnish are not introduced into the system, as they are in the internal combustion piston engine.

This writer, Gary Vesperman, attended the 3rd International Symposium on New Energy in Denver, CO (April 25-28, 1996). I remember being impressed by Gerald Orlowski"s lecture "Magnatron, Fusion Magnetic Motor", during which he provided substantial technical information on the Magnatron.

Orlowski reported that, "Some inside information revealed that OPEC had been keeping track of all competitive technology", and Johnson was #1 on their hit list! Johnson was about to manufacture the motors through a nationwide dealership. Some motors still exist, but the owner wants several million dollars for them."

This writer Gary Vesperman knows of very few inventions of new energy sources which are reasonably large stand-alone energy producers. Besides the Magnatron, they include Oleg Gritskevitch's hydromagnetic dynamo, and Electron Power Systems' micro-fusion reactor, which employs stable high-density plasma electron spiral toroids. Almost all inventions of new energy sources are, or claimed to be, relatively small over-unity power converters that convert input power to greater amounts of output power. Bob Dratch's thorium powerpack is an exception (see above).

At the September 14, 2005 public meeting in Green Valley Ranch casino regarding the proposed Regional Fixed Guideway traversing Las Vegas, Nevada, this writer Gary Vesperman submitted comments suggesting possible power sources for the train, including descriptions of the hydromagnetic dynamo and the micro-fusion reactor (http://www.rtcsouthernnevada.com/rfg/documents/September2005PublicMeetingMinutes.pdf, pp. 19-77).

No wonder the Magnatron's inventor, Rory Johnson, was rumored to have been "Number One" on Organization of Petroleum Exporting Countries (OPEC)'s hit list.

The following is an excerpt, slightly edited, from Orlowski's lecture transcript where he tells about his unwitting personal involvement with the U.S. Government's suppression of the Magnatron:

"After I saw the Magnatron motor, my life changed. I was no longer a happy camper working by myself in a wonderful, fully equipped research machine shop for the Greyhound/Armour Corporation in Arizona. While on a business trip, I saw this motor running in the Magnetron, Inc.'s showroom located in Eglin, Illinois.

"During my 15 years of electric motor repair, among the hundreds of motors I repaired, I rewound a 500 HP electric motor. That motor had wires exiting it that were the size of a garden hose. The Johnson motor being shown had NO wires. Surely this motor was unreal, a con-job to get money for dealerships. Yes, there he was, Rory Johnson standing next to his sealed self-contained electric motor.

"Upon returning to the Greyhound Towers and telling them what I had seen, they instructed me to call Mr. Johnson. Greyhound wanted Johnson to put forth a plan to install a motor in one of their buses for testing purposes.

"I called Johnson. He was delighted that a Greyhound employee had seen the motor running, and replied that the testing idea was acceptable. He would set a time frame for just when a bus should be delivered to him.

"Two years went by, with no business proposal from Johnson. Then, his former business partner, Mike Marzicola, called to say Johnson had passed away. He wanted me to work with him to get one of the motors running. I flew to Orange County, CA, saw the motor, took pictures, and put forth a plan to Greyhound. Subject to a contract with Marzicola, one of the old worn motors would be brought to the research shop. I would then very carefully reconnect the generator wires that Johnson had cut off prior to moving from Elgin, IL to California.

"Discussions with Marzicola brought out that the U.S. Government (given the authority by the Congress of 1952) had issued a GRAB order to take Johnson's motors. Rumor has it, the DOE is run by US oil companies and OPEC, and they want no competition, period. Because of this grab order, Johnson had cut the generator wires. He had then put his `total shop', with motors and all, on several U-Haul trucks and left Illinois in the middle of the night. He went to California to re-establish his business. But before he could get a motor running, he passed away.

"Surely, Greyhound would agree to let me re-start one of Johnson's motors. The wonderful proposal put forth to Greyhound was rejected by mail. Very agitated, I went to the top office at Greyhound demanding an explanation. I was met at the door with the comment, "We know why you are here." Knowing the potential savings to the bus company, surely they could have only one reason for rejecting the proposal. They must have believed I was not qualified to start up the motor.

"Greyhound's top legal advisor stated he was present when the Greyhound board met and discussed my written proposal. He stated the following, "At NO time was the thought put forth that you would not succeed. In fact, we discussed all of the hardware designed and constructed by you, and started the conversation from what happens when Greyhound has a running motor. We contacted a State representative who felt this motor should not be allowed to be used in 4,000+ buses. The loss in tax dollars for fuel alone would be a very huge sum." He then asked me to leave, stating he was sorry that he had to tell me the reason the plan was rejected.

"Telling Marzicola of the rejection, I offered to personally put in a few thousand dollars toward the parts to get one motor running. In return, I would be assigned the dealership for the Phoenix metropolitan area. We signed legal papers in exchange for the money agreed on, and went to work. (I still have the signed dealership.)

"The first thing I noticed was that someone had been working on repairing the motors. Three motors already had new commutator assemblies installed. Each assembly consisted of 3 commutator assemblies on one insulated tube with a metal case to secure it to the shaft.

"One motor still had the old worn commutator assembly, as it had not yet been repaired."

Orlowski goes on to describe his reconstruction efforts and includes interesting technical details about the Magnatron's structure and theory.

Johnson did not know that OPEC tracks all potential competition to its oil business and that he was reportedly number one on OPEC's hit list. His first mistake was publicizing, in many magazines, his plans to manufacture and distribute his revolutionary motor.

Erik Masen has spoken with a few people who even signed up for distributorships. Erik Masen had included Johnson and his Magnatron in his energy invention suppression anthology (see http://www.electrifyingtimes.com/erik_masen_suppression.html).

In 1979, Johnson placed his engine in a Buick Electra and was preparing to drive it around the country to sign up more distributorships when the US Department of Energy and the State of Illinois teamed up to prohibit his company Magnatron, Inc., from producing and selling Magnatrons. They first placed a gag order on all the people in the company by using the Secrecy Act of 1952. Secondly, the State of Illinois immediately requested the company to provide information about all of their employees, distributors, stockholders, investors, suppliers, etc. They asked questions that blatantly deny anyone's constitutional rights to privacy. The pressure from the State of Illinois became so overwhelming that Johnson decided to move his entire business to California in the middle of the night.

After a year of hearing nothing but silence from Johnson, Greyhound agents tried to contact him – only to be notified that he had passed away unexpectedly. This is a particularly troubling part of the story, since he had been in his early fifties and in robust health. Later, Greyhound learned that shortly before he died, Johnson had inexplicably moved out of his laboratory in the middle of the night and taken all of his motors and technology to California.

Bob Bass, in his report copied above on low-energy nuclear transmutation, claims that the CIA, the KGB and the Mossad, etc. all have "sprays" which can be sprayed upon someone and cause him or her to die of apparently natural causes. One speculation is that Johnson's death – apparently due to heart failure – had been artificially induced by such a spray.

In a January 20, 2007 email to Gary Vesperman, Terry Sisson reports:

"Hi Gary,

"I visited Magnatron, Inc., in July 1979. I wish I would have taken a photo. Placards were placed over every inch of the large windows in the front of the building listing all of the questions the State of Illinois requested his company to provide. He wrote, "When has the government ever had the right to ask this of any company." I peeked in the front window and saw one of his motors mounted on an engine stand. Nobody appeared to be there so I walked around to the rear of the building. I found the rear garage door open and could see the Buick Electra inside. I was about to approach nearer when a man emerged. We talked, but he quickly informed me that due to a US gag order he was unable to talk about anything. I managed to get his phone number and called him from time to time for years following. He was an assistant of Rory's and he kept the information very close to the vest. He did tell me that it was real and it worked, yet not how it worked.

"About 1984, I began to call all the Johnsons in the phone book in Elgin. I finally got a hold of Rory's son. He too said that it was real, but I got nowhere. Around 1992, I met Jerry Orlowski, and he told me his experience as the employee of Greyhound who was sent to investigate the technology, since he wound electric motors for several years. Jerry was very upset about the whole incident, particularly Greyhound's Board of Directors refusal to utilize the technology after he found the technology to be authentic. Jerry even witnessed the government's seizure of the motors in California. --- Terry Sisson."

Energy invention suppression-pertinent quotable comments from Johnson:

"There have been very few startling things that have come from a large organization. You don't get anything practical out of a government-sponsored laboratory such as Fermi and Argonne."

Johnson believes watching a budget as required by government-funded programs stifles creativity and the ability to take a chance.

The US Department of Energy (DOE) is termed a rip-off by Johnson. “Right now our government is not looking for energy in any form. A tremendous amount of money is spent (on DOE) every year and so far I haven’t seen anything out on the road or helping heat your home or helping reduce the cost of your utilities or anything else.” (For example, the DOE’s glamorous multi-billion-dollar hot fusion research program seems to be fundamentally a public relations ploy which allows the DOE’s numerous highly paid bureaucrats to have lots of fun making themselves look useful without posing any serious competition to the oil and power industries for at least decades, and may always be for decades. Gary Vesperman)

Howard R. Johnson: Permanent Magnet Motor

Howard R. Johnson has developed a device resembling an electric motor which produces work without electrical input, using only permanent magnets for motive force. The basic principle of his magnetic motor is that its magnets are arranged in such a manner that its magnetic flux is always unbalanced, thus producing a continuous rotational drive. For patent descriptions, detailed theories and diagrams, see http://rexresearch.com/johnson/1johnson.htm. Two links to additional information can be found in http://www.web-space.tv/free-energy/. More information apparently is available from the "Permanent Magnet Research Institute", P.O. Box 199, Blacksburg, Virginia 24063.

Johnson spent six years fighting the patent office to accept the reality of his magnetic motor. In April 24, 1979 Johnson finally got a US patent – 4,151,431 – for a Permanent Magnet Motor that starts itself and would deliver 5 kilowatts from permanent magnets. Jet Propulsion Labs built a prototype 5-kilowatt generator.

In his January 20, 2007 email to the New Energy Congress, Ken Rauen reported:

Howard Johnson got his patent because he DEMONSTRATED one in the courtroom. The judge ordered the USPTO to give him a patent. I saw a copy of the court document while in Gene Mallove's employment. Unfortunately, the whereabouts of that document is unknown, as Gene was not a good file keeper, and he is not around any more.

What was demonstrated was a roller skate on a linear track, fitted with magnets, and a line of magnets over the tracks. The track was slightly sloped up, so gravity could not be attributed for the motion. Since it flew off the track end and was not jerked back, it had to have net energy imparted to it.

Ken Rauen

That demonstration looks similar to the prototype of Stewart Harris’ theory of magnetic instability (see below).

Johnson’s other two patents are No. 4,877,983 for Magnetic Force Generating Method and Apparatus, and No. 5,402,021 for a Magnetic Propulsion System. In all Johnson is connected with more than 30 patents in the fields of chemistry and physics.

The following suppression account is an edited consolidation of information from an exchange of emails between Gary Vesperman and Al Witherspoon, a long-time associate of Howard Johnson. June 2006 Al had read on the Internet Vesperman’s third version of this compilation (now in its fourth version) of energy invention suppression cases and had then emailed Vesperman. Al is a businessman and the inventor, in one week, of a crucial part of the Hubble Space Telescope that had stymied other engineers for months.

To refresh memories for Al’s story, Al and Howard had some pleasant visits August through October 2006. Howard is now 92 years old but still healthy with a keen memory.

Al’s involvement with Howard’s project was not from a technical standpoint but rather from the standpoint of technology suppression. Al had never taken the time to write this up. He thinks that it's about time. Al has been holding back his suppression story for nearly thirty years.

Howard Johnson actually began his work on this motor in the 1930's. When he first started the project and conceived the idea on paper, the materials needed for the construction of the motor had not yet come into existence. However, he told Al that he knew that someday they would become available, and then he would be able to construct it.

The suppression of the motor is occurring by the general methods in addition to Howard's own suppression due to his warranted mistrust of fellow scientists. Things have come up missing and promises not kept.

When Howard first introduced the development of his permanent magnet motor there was a nearly immediate world symposium organized and held at Virginia Polytechnic Institute and State University. A number of scientists came from all over the world to attend this event. There was quite a buzz in the air about this new technology prior and existing through some finite time during the event. Al met and conversed with a number of them. A couple of them were actually quite friendly. The rest were seething with egomania and the disinterest of speaking to whom they assumed was a local hillbilly.

It was not a conference. It was merely a one-sided presentation of the technology and there was no entertainment of questions. The rules of the event were such that questions were to be saved for the end of the presentation. At the end of this presentation, the speakers quickly vanished at the moment of the last word. A couple of questions were addressed, but the respective replies were only "I don't know" or "I cannot say at the present time".

The primary focus seemed to be entirely that of debunking the notion of such a device. There was absolutely no positive attitude in the air with the exception of a few attendees who expressed the hope for the further investigation and development of the technology. Most attendees were nearly laughing with skepticism. One who Al spoke with was emphatic with his opinion that the device was viable.

Al recorded the event on audio, but there seems to be no record of it now. Al does not know what Howard did with it. When Al visited him summer of 2006 he could not remember the specifics of the tape or where it might be located at the present time.

Also at the symposium there were a couple of people making an apparently 'approved' video tape of the presentation. There were no other apparent attempts to videotape the event.

Al was the last of the attendees to exit the event. He watched what was done with the video tape.

A man took the video tape downstairs and then discretely gave it to another man. This 'other' man then went to his car and drove away. Al followed him until he arrived at Inland Motors Division of Kollmorgan Corporation in Radford, VA where precision drive motors and systems are manufactured. He got out of his car and went into the building.

Al asked the guard if he knew this man and he said that he was not an employee but was a U.S. Government inspector from Washington, DC. From this point on there is no more information about the identity or the purpose of his actions.

Some months later Al confronted the directors of the symposium. Their words to him were such that they had apparently reconsidered their position of belief concerning the technology. A little later Al found that these directors were under the direct employ of Kollmorgan and also by virtue of the fact that they stood to receive sizeable renewal grants for their respective departments.

Do you suppose that it was Kollmorgan who wanted the technology to be suppressed? After all, they stood to gain by creating disinterest such that they could quietly and anonymously pursue it for their own use without the threat of competition.

A couple of weeks later the house across the street from Howard's house which had housed a few of the working class became occupied by two agents from the National Security Agency. Al acquired the nature of their identity by unusual means. Besides this, they stuck out like a sore thumb, dressed similarly to Mormon missionaries but older in stature. They stayed there for about one year. Periodically Al went by there to see what they were up to but only saw them outside once.

They likely saw Al at Howard's place on numerous occasions but never spoke to Al and reportedly spoke to Howard only once. The nature of the conversation that Howard had with them supposedly had nothing to do with technology but was apparently just everyday common chit chat.

Al wondered what they did all day. He got to thinking that they probably sat around doing what all government officials do, smoking dope without exhaling while watching cartoons without exhaling. Please overlook Al's slight humor.

Then one day they were simply GONE. Al asked the owner of the property who they were. He said that they were Electrolux vacuum cleaner salesmen. Al almost busted out laughing. Al's great uncle was one, and Al has seen several at his front door, but never those that dressed like these guys.

During their stay Al received a rather strange phone call one day in April 1979. A man simply asked for Al, and Al simply said hello, thinking that it was likely one of his customers or a telemarketer.

He quickly identified himself in such a way that Al could not understand his name. When Al asked who was calling he simply replied by asking Al if Al was acquainted with Howard and how long. He was very nice and thus Al answered him due to Al's probable youthful naivety. He then simply said "Thank you" and hung up. Caller ID or the *69 features were not available yet at that time.

On three occasions after this between 1980 and 1983 Al's house was broken into in a nondestructive and undetectable manner, meaning that the method of entry was not discernable as being unauthorized. However it was very apparent that someone had been rummaging through the house in ALL the rooms including the garage and basement. No valuables were ever taken. At the time there was some jewelry, other precious stones, silver, gold and a letter from Robert E. Lee in relatively plain view which at that time were valued well over $100,000. These were likewise never touched. Since then these items have been removed to a safety deposit box.

Whoever broke in never found any devices or related documentation. However, Howard's house, as far as Al knows, was never invaded until early 2006. Al and Howard have no idea who did this, but there were no prints to be found. They only took documentation which had nothing to do with the technical aspects of the motor or its design. The documents were related to contractual agreements concerning the disclosure of the technology.

In 1985 Howard reported to Al that he had struck a deal with General Electric. For fifteen million dollars the company had purchased an exclusive (but not 'sole') license to make, manufacture, market and utilize the motor. By 1986 General Electric had built a very, very large working model the size of a house. It is not being used and is kept hidden in a building under armed guard somewhere in the United States. (However, it doesn't quite make sense that the company would build such a very expensive large motor when a much smaller, cheaper motor should be adequate for experimental studies. Gary Vesperman)

Al never asked Howard what he did with the proceeds. A reliable source did tell Al that the agreement with General Electric was such that they give the $15 million to a certain charity.

Since that time there has been no other publicly known activity with the motor by General Electric. Al suspects that the company is using it to get paid by the oil industry to keep it under wraps – industrial/technological extortion or protecting the world, or possibly both. However, this notion is merely a notion and surely speculative.

Al's guess is that General Electric could simply and easily make a substantial amount of money by keeping things quiet while at the same time using it as a card to play when the time is right. Al knows exactly how they could do such.

Howard and Al have found that American and Japanese magnet manufacturers are mysteriously very reluctant to provide the needed magnets. In the report below on "Yasunori Takahashi: Magnetic Wankel Motor" John Moreland explained that the secret to the enormous strength of the Takahashi magnets, at 25,000 gauss the most powerful magnets ever developed, is that they contain uranium. The U.S. Government forbids importing radioactive materials.

Throughout the past twenty-eight years approximately, there have been some reported attempts to construct the motor. Al has NEVER seen one in the possession of any individual outside of the Permanent Magnet Research Institute.

Finally: Howard, by claim and Al's personal opinion, has sufficiently disseminated the technology to the point such that the motor can be replicated. Replication of the motor has apparently achieved little known success. There are reasons for this lack of success.

There seems to be little doubt that this device or similar devices have been built. They are relatively easy to build and do not require any sort of special magnet type in order to be functional. Actually, ordinary magnets are better from the standpoint of the homebrew versions. Very powerful magnets are difficult to keep seated in place. Also, experimenting with super-strong rare-earth magnets without special equipment and training can easily cause injury.

The notions that are reflected in comments made by others as to the theory of operation are not correct by any means. The energy required to charge the magnets have nothing to do with the energy delivered by the motor. Many would say that this is most interesting and important.

Al has found, in the process of examining various cases, that few individuals if any, have the correct blueprints. Also, the blueprints are not a whole lot of help unless a person has a clear understanding of certain principles of magnetism. Though this motor can be successfully constructed with "off-the-shelf" components and not to mention being done so in a crude fashion, the apparently ability of most is not sufficient to attain a working model of the rotary motor.

Al has seen theoretical speculation concerning certain magnetic principles by "respected" members of the HJ Motor Group that further suppress the successful application of the technology. Though likely not intentional it is nevertheless the result of careless thinking and poor technological vocabulary. Such practices propagate inaccuracy and inability to produce any viable results and end up merely creating a vicious circle resulting in lost art and the downward spiral of success.

Al discussed this matter with Howard during one of their visits. They were able to arrive at some conclusion perhaps, but that of which will not presently be disclosed. Al needs to think about it a little more.

As far as participation by other individuals:

To date, there has been no person that has kept their word concerning certain aspects of disclosure. There have been no individuals that have kept up other agreements directly related to the use and dissemination of the technology. Some individuals have replicated Howard's research in various ways, including the distribution for gain, in such a manner as to claim it as being of their own origination. This may include the distribution of nonfunctional blueprints. As far as Al knows, Howard has only and repeatedly been the victim of greed and egotistical lust.

To date, not one single person has ever commented on Al's advice for making the motor work. This show of apparent ignorance eludes Al's belief.

At this point in time Al does not believe that Howard is highly inclined to divulge any more information to the general public or prospective co-participants. The royalties due on his recent book have not been paid either. This situation will change with the publication of his new book containing advanced theory. Those who have any sense, in my opinion, will be well advised to read it.

And as for Al himself: He is presently looking for a few good men. To date Al has only been in contact with one or two individuals who have shown even a spark of integrity. At the present time, there are only two individuals actively involved with the Permanent Magnet Research Institute.

Howard's parting and publishable comment from their meeting of October 10th was simply as follows and quite closely matches his exact words: "If you can't believe what you see, then there is little else that I can do for you."

Al thinks that it's not always the government that suppresses technology. Sometimes it's the individual who bites off his or her own nose to spite his or her face. That is, the government does not need to directly suppress the technology because the citizens are doing a splendid job all by themselves.

However, it should be noted that it is plausible that negative elements hide behind the veil of our good society WHO serve the purpose of being suppressing agents.

It is not necessarily our government which doles out the suppression. They often get blamed for a lot of things which are merely the bad direction of a small individual or group within.

Maybe the distribution of incorrect information is being done by the implant of a suppressing agent(s)?

Virginia Polytechnic Institute and State University does not help Howard though he lectured there for a while. Most of the technologists there are quite jealous of Howard and for whatever reasons seem to be a major contributing factor to the suppression of the technology. The college is where the first world symposium took place. Al was sent there to eavesdrop and record the presentation which was largely an attempt to discredit his work. Al spoke with some of the scientists who attended the symposium. Most were quite skeptical, both about the technology and the true intentions of the lecturers. Some even left in laughter. There were a few who expressed that they sincerely hoped that the technology would come to perform, regardless of any negative opinions.

However, this apparent suppression may have been done with Howard's ultimate blessing since such a discrediting would likely draw attention away from his work yet get the ball rolling for world curiosity and open some minds. Making money at this sort of thing was a hopeful wish for Howard since he is by no means a wealthy man. Aside from this he just wanted to help the world. He reminded Al, however, that not all good things are good for mankind and that the introduction of such technology to the world would indeed be disruptive. After considering his comments over a period of nearly thirty years, Al has come to realize that Howard's concerns may warrant some serious consideration.

Al intends to see Howard again sometime to find out by some gentle fashion if this early suppression indeed was his intention, or if it simply occurred inadvertently. Also Al plans to find out whatever else he can since time is short and Howard, being 92 years old, may not be here for very much longer.

As mentioned above, this account of Al's suppression story is a consolidation of emails exchanged between this writer, Gary Vesperman, and Al Witherspoon up until mid-October 2006. However, I have emailed Al a few more questions. But since then I haven't been able to contact Al by phone and email.

For instance, it is not clear to me whether the two National Security Agency agents had rented a house across the street from Al's house or Howard's house. How were they able to still acquire needed magnets which they weren't allowed to buy? Exactly what did happen at Oak Ridge and Howard's involvement in the development of the atom bomb? What were the real reason and circumstances relating to the Science and Mechanics article? What happened in 1941 at the U.S. Patent Office 37 years before Howard actually commenced construction? What are the details regarding the construction of the generator at Jet Propulsion Labs? What's this about snowflakes and honeybees?

Stewart Harris: Theory of Magnetic Instability

The theory of magnetic instability is a magnetic principle which appears to be the embryo of a valid free energy device. It was invented by Stewart Harris. He applied for a patent in 1978, and it was rejected. Dr. Marion Bowman from Washington, DC traveled out to Mr. Harris' home in Las Vegas, Nevada to witness the operation of the device. He was impressed and returned to Washington enthusiastic about its applications.

Shortly after the demonstration, all copies of the patent application and other information subsequently disappeared from the US Patent Office in Washington, DC. In addition, Mr. Harris' home was broken into and his original drawings, papers, applications, and correspondence were stolen. For some unknown reason, they left behind the prototype. Coincidentally, Mr. Harris lives just a few blocks from the office of Film Funding, Inc., where this writer, Gary Vesperman, used to work in Las Vegas.

For some time I had Harris' prototype on my desk which I delighted in demonstrating to visitors. A horizontal three-inch-long roller cylinder of about five stacked 1-inch diameter disk-shaped magnets rolls UPHILL, without energy input, between two similar four-inch-long cylinders of about ten stacked 1-inch disk magnets placed in parallel with each other and taped onto a cardboard ramp (try 30 degrees up from the horizontal).

Radio Shack sells disk magnets, but they are a little too strong. The horizontal cylinder rolls uphill a little too fast. Try weak disk magnets instead, or strong magnets that are made weaker by thermal or mechanical shock.

I had noticed while playing with Harris' device that the roller cylinder would hang up at the top of the incline. But if the cylinder was immediately picked up and placed back at the bottom of the incline within 60 seconds, it would accumulate enough additional rotational angular momentum of unknown origin to fall over the top of the incline.

At the International Symposium on New Energy that was held in the Denver Hilton South, Denver, CO (25 – 28 April 1996), I asked Dr. Harold Aspden if his "Aspden effect" is the same as the roller cylinder's temporary accumulation of additional rotational angular momentum. He said it is not. However, Aspden and I decided that it appears to be such an interesting etheric energy phenomenon it should be investigated further.

This is what would make a fine project for a grade school science class: Try magnetic disks of various sizes and strength. For each particular size/strength, carefully record various time delays between the time the rolling cylinder is taken off the top of the incline and placed at the bottom of incline. There might be some type of "half-life" whereby the roller cylinder's residual additional rotational angular momentum decays with time until the roller cylinder hangs up again at the top of the ramp.

Lester J. Hendershot: Hendershot Magnetic Motor

During the late 1920's Lester J. Hendershot, while working on a new type of aviation compass, stumbled across a method of generating energy. The "Hendershot magnetic motor" made headlines and attracted such big name investors as Charles Lindberg. Hendershot, while attempting to establish a true magnetic north compass, found that by cutting the same line of magnetic force north and south, he had an indicator of the true north and that by cutting the magnetic field east and west, he could develop a rotary motion. He wove together a number of flat coils of wire and placed stainless steel rings, sticks of carbon and permanent magnets in various positions as an experiment. Based on this principle, after two years of trial and error, he built a magnetic motor that would self-rotate, to his surprise, at a constant speed of 1800 rpm while producing 45 horsepower.

Hendershot changed directions and decided to build a generator on the same principle, after deducing that a magnetically-powered motor was not as practical as a magnetically-powered generator. Hendershot had discovered that the Earth's rotating magnetic field could be used to provide power to motors and generators, much like Nikola Tesla's discovery that the Earth was a huge capacitor, capable of providing significant amounts of electrical power. Simplified, Hendershot believed that if one were to cut the lines of force of the Earth's magnetic field, one could harness this to provide direct power to generators and motors. Nikola Tesla attempted to do just that, when he built his "magnifying transformer" at Shoreham, Long Island, NY.

To read the first hand accounts of Hendershot's historical encounters, see the following research links:

http://www.time.com/time/magazine/article/0,9171,880984,00.html
https://secure.netsolhost.com/nuenergy.org/alt/RadonFuel.htm
http://www.clubusenet.com/thread/262719.html
http://www.borderlands.com/freeenergy.htm
http://www-tech.mit.edu/archives/VOL_048/TECH_V048_S0041_P004.pdf
http://www.clarabow.net/articles/ourreaderswrite.html
http://www.freepatentsonline.com/20070007844.html
http://www.rexresearch.com/feg/feg1.htm#hendershot

Hendershot ran into political difficulties in promoting his device, attempted to take his business to Mexico, and finally faded into obscurity having taken a "couldn't refuse" payoff to never work on his device again. (Source: http://www.ssrsi.org/sr2/Heat/fed.htm)

In 1961 Dr. Ed Skilling, from Columbia University, successfully replicated and tested a Hendershot free energy device, out of which he got 300 watts. Skilling had been associated with Hendershot and learned of the device through him. The generator was self-resonant at 500 kHz.

James Watson: 8-Kilowatt Battery-Popper Motor

Thomas E. Bearden, Ph.D., has provided a significant 'account', dated 1999, regarding James Watson located at http://www.cheniere.org/misc/battery%20poppers.htm, copied as follows with some editing:

James Watson successfully replicated Bedini's battery energizer (with direct advice from Bedini). Watson made improvements and modifications, and eventually was able to build one and adjust it as he wished. He demonstrated an 8-kilowatt battery-popper motor at the first International Tesla conference in Colorado Springs in 1984.

Later Watson was moving toward development and marketing.

Then Watson and his entire family disappeared. Neither Bedini nor I could locate him. Neither could his financial backer, the late R. J. Reynolds III. This was a researcher and friend whom I was in contact with several times a week. Then bingo! Nothing further.

He [Jim Watson] abruptly and completely broke off all communication with everyone. A squirrelly message was left on his answering machine for a few days, saying he had moved (but not in Jim's voice). Then it too was removed. And that was that.

Eerily, it seems that if you call the police in the town where Jim Watson lived, they will tell you he still lives there on the same street in the same house. At least that's what they told a friend of mine who checked a few months ago, which is years after Jim and his family originally disappeared. And that check may be the oddest thing of all. The police implied on the phone that Jim and his family never disappeared. Everything fine. A-OK. And that's a bald-faced lie. He and his family did disappear. No one could find them, regardless of how they tried. His financial backer couldn't even find him.

The clear implication is, stay away from that one. Somebody "from the dark side" may have made Jim the "offer he could not refuse". One may never know what really happened, whether or not Jim ever surfaces again — or has already surfaced again and is living there very, very quietly. But Jim's entire over-unity motor effort ended abruptly, even though highly successful. And even though the motor was almost ready to be put into production.

Watson has not been seen at an energy conference since that sudden mysterious disappearance. No one has had a phone call from him. I have not found anyone I trust who has seen him again.

You have not seen a Watson over-unity power system go to market. You almost certainly never will.

Yet Watson's device was perfected to the point where he could make the things like pretzels, adjust them readily, and they worked every time. They could have been put into mass production very easily. Obviously that made him a grave threat to the energy cartels around the world.

At rare intervals, the energy cartel does suppress an invention and an inventor by making the inventor "an offer he cannot refuse", in Mafia terms. Presently the going price when that offer is made is $10 million. You take your $10 million, quit all research, quit your contacts, and you live. But you live very quietly, although you live very well financially.

The engineers who measured Watson's 8-kilowatt machine there in Colorado Springs are still alive. And they know what they measured.

There's one other little thing. At that same International Tesla Conference in Colorado Springs, the folks who were in charge (for the energy barons) of suppressing all successful over-unity devices in the Western world were also there when Watson demonstrated his 8-kilowatt device. There is a certain effect which happens in a battery sometimes for a large over-unity battery popper unit like that, if the device is "for real". Time-reversal operations and wave transductions can occur, resulting in time-excitation charging inside the battery materials, in a negative time charge sense (remember, the over-unity operation is a negentropic operation). After a machine of that type and with that particular internal effects has been used to furnish energy for quite a while, you can make a definitive test on it. Simply hook it to a normal battery charger for that size battery, and start to charge it. You then may find to your surprise that the power will just seem to "disappear" in that battery, without charging the needle one iota, for 16 to 48 hours or longer, and in a rare case for two weeks.

The reason is that wave transduction occurs of your charging spatial energy into time-energy, and so you have to furnish rather enormous energy to get a little bit of that negative-time charge reversed. After you fill that seemingly "bottomless pit", then suddenly the negative time-charge will have been eliminated, and at that point the battery will start to charge up in quite normal fashion.

It is significant that Watson’s battery was stolen right out of the machine. Whoever did it, almost certainly knew how to test it to find out if Watson's generator was actually a true over-unity device. If so, then they tested it and found that indeed it was genuine.

And there was only one group there who would have known that little tidbit.

Hitachi Magnetics Corporation: Magnet Motor

Engineers at Hitachi Magnetics Corporation have come right out and claimed that a motor run by magnets is feasible and logical, but the politics of the matter make it impossible for them to pursue developing a magnet motor or any device that would compete with the energy cartels.

Among the obstacles to free energy are the big banks who own or finance the energy industries. Peter Lindemann, D. Sc., offers an analysis of these obstacles in http://www.wanttoknow.info/newenergysources or http://www.spiritofmaat.com/archive/feb2/lindemnn.htm. Lindemann suggests that the four forces suppressing new energy devices are the world's wealthiest families and their banking institutions, national governments striving to preserve national security, deluded inventors and con men, and the unspiritually motivated behavior of all the rest of us.

Floyd Sweet: Vacuum Triode Amplifier

Floyd Sweet had invented an advanced, solid-state, magnetic power converter called the "vacuum triode amplifier". If it could somehow be made stable over a long duration, it potentially offers an exceptionally high ratio of output power to input power in the range of one million. The somewhat unconventional physics of the device is explained in http://rexresearch.com/sweet/1nothing.htm. The site also describes efforts to suppress Sweet's research and development efforts:

Two people from Australia, who claimed they wanted to help Floyd, stole his notebook and promptly asked John Bedini for help in replicating the VTA based on the notebook contents. John recognized the notebook as belonging to Floyd and promptly asked them to leave. However, the notebook was never recovered.

Sweet received many death threats over the phone and some threats face to face. A well-dressed gentleman in an expensive suit, tie, hat, and hundred-dollar shoes approached Sweet on the sidewalk of the street where he lived and introduced himself as Cecil Brown. Brown showed Sweet a photograph of Sweet inside his apartment. Brown then told Sweet that he represented a conglomerate that did not want Sweet's device to appear in the world at this time. Brown further stated that sometimes unfortunate things happen to people who do not comply with the wishes of others. Brown then retrieved the picture and departed.

Gary Vesperman's file titled "Bearden web site on electrical energy" includes these three excerpts written by Tom Bearden:

"A particularly good higher group symmetry electrodynamics, in this author's opinion, is the O(3) electrodynamics founded by Evans and Vigier and further expounded by Evans {[xxxviii]}. Evans has shown that O(3) electrodynamics is a part of the Sachs unified field theory electrodynamics {[xxxix]}.

Thus O(3) electrodynamics can be used not only for modeling "normal" electrodynamic but also for modeling "exotic" unified field theory. Further, it can be used for engineering, so it permits the development of a drastically extended electromagnetic technology which can eventually engineer many new phenomena {[xl]}, including anti-gravitational effects {[xli]}. At least one highly successful antigravity experiment was performed by Sweet, in an experiment designed by the present author {[xlii]}. The weight of an object was steadily reduced by 90%, on the laboratory bench."

"Sweet was fired at from about 300 yards by a would-be assassin, using a silenced rifle. Being old, he stumbled and fell on the steps just as the assassin pulled the trigger. The bullet snapped right by his ear, where his head had just been. Thereafter, Sweet was always deeply paranoid about taking the unit outside his own apartment or continuing to develop it. I personally worked with Sweet for some years." (End of Bearden's report) Dr. Bearden provides more details on Sweet's interesting device in http://peswiki.com/index.php/Site:LRP:Tom_Bearden_Remembers_Walter_Rosenthal_%26_Floyd_Swee t.

John Bedini: 'School Girl' Motor and Battery Energizer

John Bedini, Idaho, designed the 'school girl' motor and battery energizer. Some years ago, three thugs came to his home and beat him severely. For a time he went underground and retracted all information on his devices. See http://www.icehouse.net/john34/bedinibearden.html.

Two Inventors: Model T Ford Generator with Magnets Added

About ten years ago, two very clever backyard inventors took a magnetic, electricity-generating flywheel off a Model T Ford, attached stationary magnets in a spiral arrangement to the outside, and developed a self-generating motor-generator, using the pulsed varying distance magnetic spiral principle. This generator continually produced 1600 watts of power with no other input. They demonstrated their generator at UCLA – confounding the professors, students and other observers.

Evidently some heavy-handed U.S. Government/corporate types were in the audience, however, because the inventors never made it home from their demonstration. They were found dead along the highway. Their trailer, containing the generator, had disappeared.

Apparently the Japanese now have the technology, which they are calling the "Magnetic Wankel'" motor. (Excerpted with permission from Erik Masen's article "SUPPRESSION FROM HIGHER UP Inventors Beware! The Deadly Campaign Against Free-Energy Devices", *Electrifying Times*, Vol. 8 No. 3, and also in http://www.electrifyingtimes.com/erik_masen_suppression.html.)

Yasunori Takahashi: Magnetic Wankel Motor

Yasunori Takahashi, the famous Japanese inventor who developed the Beta video cassette recorder, has retrofitted his newly developed, super-powerful "YT" magnets into his 15-horsepower Magnetic Wankel motor scooter, claiming he can obtain 15 horsepower from a few amperes of electricity. If the U.S. Government allows the Japanese to export these scooters to America, we will see a further trade deficit in Japan's favor.

Rumor has it, however, that the U.S. Government refused entry to the Magnetic Wankel motor (in Mazda vehicles) several years ago, just as it blocked Honda's super-high-mileage, gas-powered cars at about the same time. Such protectionism may be "good for business" (at least for the oil companies and domestic auto manufacturers), but it hurts others and punishes the environment. (Excerpted with permission from Erik Masen's article "SUPPRESSION FROM HIGHER UP Inventors Beware! The Deadly Campaign Against Free-energy Devices", *Electrifying Times*, Vol. 8 No. 3 and also in http://www.electrifyingtimes.com/erik_masen_suppression.html.)

At the 1997 International Tesla Society Symposium in Colorado Springs, Colorado, John W. Moreland, Ph.D., a health physicist, lectured on his experiments with radiovoltaic electrical generators. (Compare with photovoltaic generators such as solar panels.)

Paul Brown lectured separately on similar work based on converting cosmic rays to electricity. Brown had been working mainly to recreate T. Henry Moray's generator.

Brown and Moreland found a strange quirk of ether physics involved with their over-unity electricity generating devices. It had been assumed by many, including Gary Vesperman as the basis for his advanced self-powered electric vehicle concept, that part of the output can be picked off and fed back directly to the input. The longest Moreland has been able to get his generator to run is three weeks. Then the generator dissipates like a cat getting tired of chasing its tail.

Brown and Moreland were still experimenting with voltage splitting, etc. Moreland said they may eventually have to take a generator's input and output out of the same time domain. For example, simply connect separate batteries to a generator's input and output.

After talking with Moreland this writer, Gary Vesperman, got to thinking that for the self-powered electric vehicle, we could have a computer monitor battery charge levels and from time to time switch around between several sets of batteries. Simultaneously at all times, one battery set is being used for the motor, another set for the generator input, a third discharged set connected to the generator's output, plus possibly some spare batteries.

When chatting with Moreland about electric vehicles, I mentioned the Takahashi over-unity motor mystery. June 1997 Hal Fox had sent me a copy of a 10-minute video showing Takahashi demonstrating his prototype over-unity magnetic motor, also known as a Self-Generating Motor (Magnetic Wankel) with a drive belt turning an alternator. The motor is shown connected to a battery for starting the motor, and the battery is then shown disconnected. Two headlights, connected to the alternator's output terminals, remained illuminated after the battery was disconnected.

A motorbike using the Takahashi over-unity motor was sent in 1996 (?) from Japan to England and then to Mark Goldes in Sebastapol, California for testing. Goldes found that the motorbike had limited range, and the magnets were unremarkable. Nobody could understand why a man of Takahashi's stature and wealth would try to pull a scam.

Moreland explained that the secret to the enormous strength of the Takahashi magnets, at 25,000 gauss the most powerful magnets ever developed, is that they contain uranium. The U.S. Government forbids importing radioactive materials. For some reason, the radioactivity of the Takahashi magnets is being kept secret from the U.S. Patent Office until the Takahashi motor patents have been granted. So Takahashi had to substitute ordinary magnets for his super magnets in his motorbike motor.

Thomas E. Bearden, Ph.D., understands that Takahashi's magnetic Wankel motor has been suppressed by the Japanese Yakuza mob. (Source: http://peswiki.com/index.php/Site:LRP:Suppression:_Alternative_Energy_Systems:_%E2%80%9CNovelty_of_Fact%E2%80%9D_Freely_Derived_Sources)

This writer, Gary Vesperman, didn't follow Moreland's explanation during his Symposium lecture how certain radioactive materials can enhance the magnetic field strength of a magnetic material. I had planned to write him for a reference that I could study. Unfortunately I lost touch with Moreland afterwards – mainly because his web site www.aztecpub.com never was active.

Teruo Kawai: Motive Power Generating Device

The key statement of Teruo Kawai's US Patent 5,436,518 for his "Motive Power Generating Device" is as follows: "Electric power of 19.55 watts was applied to the electromagnets at 17 volts and 1.15 amperes. … an output of 62.16 watt was obtained." Dividing the output power by the input power yields a coefficient of performance of 3.19.

Thomas E. Bearden, Ph.D., explained the Kawai device's operation, placed his explanation on the Internet, and Kawai and party came to Huntsville, Alabama to see him and his associates. At Kawai's urging, they negotiated an agreement with him that they would manufacture and market his systems worldwide; he already had build a closed-loop, self-powering system in Japan. Kawai would fund the entire project.

Their agreement was verbally reached on a Thursday afternoon, late. That night a jet arrived posthaste from Los Angeles, with a Yakuza on board. The next morning Kawai and his party were in fear and trembling, and the Yakuza was in total control. Kawai no longer controlled his own company, his invention, or his own fate. Needless to say, the Yakuza coldly cancelled the agreement, point blank. This happened in front of Bearden and four associates. So there are five witnesses. The Yakuza and party quickly packed up the two Kawai engines that were in the possession of Dr. Bearden and his associates, and departed. No Kawai engine will ever be permitted on the world market. Several other Japanese COP>1.0 electrical power systems have also been suppressed by the Yakuza. Many such incidents — including murder — have occurred over the last decades, right here in the United States. Others will happen. (Source: http://www.spiritofmaat.com/archive/mar2/bearden.htm)

Dr. Bearden, inventor of the Motionless Electromagnetic Generator (see above), himself has been the subject of suppression efforts, including death threats. (Source: http://peswiki.com/index.php/Site:LRP:Suppression:_Alternative_Energy_Systems:_%E2%80%9CNovelty_of_Fact%E2%80%9D_Freely_Derived_Sources)

Johan Grander: Magnetic Motor

Johan Grander of Austria developed a revolutionary magnetic motor, but was turned down by the Austrian patent office with the excuse: Inventions which are detrimental to products in existence may not be granted a patent." (Erik Masen, "Suppression of Quantum Leap Inventors", *Electrifying Times*, 2007, Vol. 10, No. 2)

IPMS-Kiev and Arzamas-16: Super Magnets

The evolution of the Soviet view of the material world was reflected in the formulation of a new model of nonlinear quantum mechanics as an implicit function of consciousness. For instance, water is more than just H_20. Experiments prove water can be affected in measurable ways by subtle influences such as music or whether a person's thoughts are hate-filled or life-enhancing. A more correct understanding of materials has thus enabled super magnets to be developed.

In conjunction with research jointly conducted at the highly secretive laboratories at Arzamas-16 in Khazakstan, IPMS-Kiev has developed a family of magnets with energy characteristics equal to or exceeding those of the best conventional iron-boron-neodymium types, but with the all-important feature that they operate with equal or greater efficiency at extremely high temperatures, up to 250 degrees centigrade. These magnets are so powerful that they have been successfully used to conduct extensive research in a perpetual zero gravity environment. All these experiments have been performed without the use of cryogenics.

Joint ventures of the IPMS with more than a dozen private sector companies to develop inventions were repeatedly sabotaged by the U.S. Government's Defense Intelligence Agency and others. (Source: David G. Yurth, *The Anthropos Files: Tales of Quantum Physics from Another World – 2nd Edition*, 2007)

General Motors Corporation: EV-1 Electric Car

Rodger M. Ward was a two-time winner of the Indianapolis 500, National Stock Car Champion, and multiple winner of the USAC Racing Championship. In 1993 Ward registered with the State of Nevada a Small Corporate Offering Registration (SCOR) for his American Electric Car Company, Inc., whereby 200,000 shares of common stock were offered for sale at $5 per share. This writer, Gary Vesperman, wrote most of the SCOR's disclosure document/business plan.

Ward's company had developed a new type of automatic transmission that will reduce the power required to propel the car and will allow a longer driving range between charges. His company also had developed a very efficient vacuum system to energize equipment such as power steering, power brakes, door locks, and windshield wipers that would ordinarily require electricity from the batteries used to power the electric motor. In addition, his company had added an extra lead-acid battery to supply power to such accessories as the radio, heater, air conditioner, headlights, and taillights. Thus the power drain of the accessories is isolated from the power used for the electric motor.

Most interestingly, Ward's company had the right of first access, via Las Vegas-based Ashurst Technology Corporation, to a new type of battery invented by the I.N. Frantsevich Institute of Problems of Materials Science, Kiev, Ukraine. Most types of batteries rely on electrochemical reactions. The Ukrainian crystal lattice battery stores the charges in crystalline layers of a sheet-like material similar in appearance to mica. Due to nonlinear quantum mechanic effects, the electrical characteristic of each crystalline layer is that of a capacitor as thin as less than one molecule.

Since capacitance is inversely proportional to thickness of the separation between the layers, the practical consequence of the crystal lattice battery is to electrically function in a manner similar to that of a giant capacitor.

The positive contrasts of the crystal lattice battery with the lead-acid battery are so striking as to justifiably portend a potential revolutionary advance for the electric car industry.

Ward's company initially planned to use twelve 86-pound lead-acid batteries weighing a total of approximately 1000 pounds. These lead-acid batteries were to be replaced with ten 20-pound crystal lattice batteries which would weigh a total of only about 200 pounds and thereby noticeably enhance driving performance.

Lead-acid batteries provide up to approximately 120 miles on a four to five-hour recharge. The crystal lattice batteries could provide up to 400 miles on a one-hour recharge. The crystal lattice batteries can supply constant voltage for up to 94% discharge. Since there is no heat nor waste product buildup as with electrochemical batteries, the crystal lattice batteries can easily last many hundreds of extremely rapid charge/discharge cycles.

The crystal lattice batteries operate well in the temperature range of -40 to +60 degrees centigrade. A side benefit of the crystal lattice batteries is that they are made only of materials which are environmentally friendly, plentiful, and inexpensive.

While the IPMS did provide test samples about the size of a large flashlight battery, they were not able to deliver on their promised 20-pound crystal lattice batteries. The U.S. Government's Defense Intelligence Agency had sabotaged the Ashurst Technology/IPMS joint venture. So the American Electric Car Company, Inc., lamentably failed to bring to market Ward's potentially revolutionary electric car.

Rodger Ward and Gary Vesperman became good friends. (BTW, he drove in city traffic, cutting in and out, etc., like the famous race car driver that he is, not like a normal driver!) Ward explained why the major automobile manufacturers as well as the oil companies suppress electric cars. Only 60% of their total profit is made when a car is sold. The dealers and manufacturers make the other 40% of their profit selling and replacing high-priced parts such as mufflers, fuel pumps, etc. Electric cars are too simple, durable and easily maintained. See his biography at http://www.motortrend.com/features/auto_news/112_news040707_ward/.

The significant profit advantage of gasoline cars over electric cars may be why as portrayed by the movie "Who Killed the Electric Car?", General Motors Corporation didn't fully support and eventually scrapped its EV-1 Electric Car. To be fair, GM claims that it refused to sell its EV-1 Electric Car because it would be unable to ensure the safety and life of the vehicle after parts makers stopped supplying components. GM also claims that the EV-1 had difficulty running uphill and didn't offer air conditioning. GM does claim that its upcoming Volt electric/gasoline car will be more advantageous than the EV-1. Because the Volt will still have a gasoline engine, the Volt should be complicated enough for GM to retain profit margins when maintenance labor and replacement parts are sold.

The complicated gasoline-powered car is fundamentally unreliable and unnecessarily expensive to fuel and maintain. It has required heroic engineering efforts to partly overcome its inherent impracticality.

Within about a year after writing the disclosure document for Ward's company's SCOR, this writer also wrote Nevada SCOR's for Natural Environmental Solutions, Inc., (NESI) and Aimrite Systems International, Inc. NESI had acquired the rights to Frank Richardson's magnet-based electrical generator that required no input power and also a bladeless Tesla-type steam turbine (see above). Aimrite Systems had patented computer-controlled hydraulic shock absorbers and a computer-controlled air ride suspension system. I have ridden a test bus equipped with an Aimrite suspension. Nice ride.

I introduced Rodger Ward to prolific Las Vegas inventor Alvin Snaper. Snaper has 600 patents, processes, and innovations such as the type font ball in the IBM Selectric typewriter and Tang the orange juice drink. Ward became enthusiastic with Snaper's demonstration of a prototype of Snaper's invention of a compressed air-driven air conditioner/heater. It relies on the principle of a vortex tube. Air whirled in a vortex tube separates with the cold air molecules collecting in one portion of the tube, and the warm air molecules collecting in another portion of the tube. The cold air is expelled from one end of the tube, and the warm air is expelled from the other end. It can be switched between providing 90% cold air and 10% warm air, or 10% cold air and 90% warm air. The metal tube is about a foot long and a half-inch in diameter with a two-inch long compressed air intake tube perpendicularly attached about three inches from one end. The intake compressed air requirement specifications are 7 CFM at 40 PSI. The volume of air expelled is twice that of a refrigerant-type automobile air conditioner while requiring only one-fourth the horsepower. Also, no warm-up period is required as with conventional air conditioners or heaters. Its efficiency is nearly 30%.

Alvin Snaper also had invented a low-temperature nondestructive process for increasing the durability of vehicle parts and tools with diamond or titanium nitride. A few years later, Snaper invented a high-performance nickel-iron battery very suitable for electric vehicles.

The Ukraine's IPMS had also invented a basalt/carbon fiber foam which is extremely strong yet lighter than fiberglass. A test vehicle made with basalt/carbon fiber foam parts was reportedly the only vehicle ever tested that can cut through a cast-iron London taxicab in a collision. (See below: "IPMS: High-Temperature Gas Plasma Detonator".)

Just for fun, I then combined these technologies into an "advanced self-powered electric vehicle concept". A current version with more details and additional technologies is available in the category "Speculative Advanced Electric Vehicle Concept" (http://www.iiic.de/docs/GVShortSummaries1-46a.htm). In addition, at a public meeting (14 September 2005) held in Green Valley Ranch Casino, Henderson, Nevada, regarding the proposed Regional Fixed Guideway traversing Las Vegas, Nevada, I submitted suggestions for possible power sources for the train, most of which also seem suitable for self-powered sources for vehicles (see http://www.rtcsouthernnevada.com/rfg/documents/September2005PublicMeetingMinutes.pdf), pp. 19-77).

The Pulsed Abnormal Glow Discharge (PAGD) reactor uses high-density charge clusters to produce useful positive AC-to-DC electrical power conversion gains such as 483%. It's an over-sized glass vacuum tube which is constructed and electrically driven within a narrow range of DC voltage so that it operates with negative resistance.

Dr. Paulo and Alexandra Correa, "New Energy Electric Power – Now! Pulsed Abnormal Glow Discharge Technology," Infinite Energy: Cold Fusion and New Energy Technology Volume 2, No. 7, March/April 1996, p. 18. Gary Vesperman's compilation of "Advanced Technologies for Foreign Resort Project" in http://www.icestuff.com/~energy21/advantech.htm includes a chapter on the PAGD reactor.

US Patent 5,416,391 for Electromechanical Transduction of Plasma Pulses. US Patent 5,449,989 for Energy Conversion System. US Patent 5,502,354 for Direct Current Energized Pulse Generator Utilizing Autogenous Cyclical Pulsed Abnormal Glow Discharges. Paulo N. and Alexandra N. Correa, Ontario.

The Correas have demonstrated 1-kilowatt outputs and have run motors under load with these PAGD reactors. GM was interested in the PAGD reactor, as the company's electrical engineers loved it. Upper management killed it, and told the Correas, "The electric car is window dressing."

IPMS: Energy Storage/Battery Devices

During the summer of 1984, airborne intelligence surveillance teams of the United States Air Force, operating out of specially configured and equipped Boeing 707 airframes (called AWAC's) electronically detected (and then shortly thereafter photographed) bursts of coherent light of enormous power originating in the vicinity of Dushambe, Turkministan. The bursts of light, a brilliant blue-green color, lasted just a few seconds and were shifted almost to the ultraviolet end of the light spectrum. The "laser" beams were directed upwards out of the atmosphere towards American military communications satellites.

At precisely the same time the AWAC's detected and photographed the laser bursts (they were referred to in that jargon by American military analysts but later proved to be something almost entirely different), several of the satellites essential to America's global military command and control communications systems became inexplicably inoperable.

The Defense Intelligence Agency, under the direction of the National Security Council and assisted by the National Security Agency, escalated its surveillance of the remote site in the Ural Mountains from which the bursts first originated. For several months, during a concerted campaign of uninterrupted observation by AWAC's and American spy satellites, no additional bursts were observed or reported. Then, without warning, in the middle of the night nearly seven months later, AWAC's crews operating just outside the territorial airspace of Afghanistan detected similar laser bursts of lower intensity during a period of intensive localized ground warfare.

The Afghanistan bursts were apparently aimed at targets under attack by Soviet infantry units. The laser bursts continued in a sustained, localized but obviously mobile attack pattern, as frequently as four or five times per hour, until nearly sunset of the next day. Photographic evidence gathered at the time by the AWAC's crew, and later corroborated by photographs taken at the actual site of the fire fight and forwarded to the U.S. for analysis, showed that the targets of the laser bursts were ammunition and fuel supply depots located in the remote desert. Several of the ammunition and fuel caches had apparently been destroyed during the attack, as demonstrated by the evidence of explosions, fire, smoke and residual infra-red heat patterns detected, photographed and electronically recorded on-board the AWAC's.

All this information was transmitted (via encrypted communications bursts, routed through the military Global Command Control satellite system) to the National Security Agency (NSA), located at Fort Meade, Maryland. Analysts there recognized that they were looking at evidence of a weapons system which had never been observed before. They did not know what had produced the laser bursts. But they did know that the technology which made such a thing possible was not available to the countries participating in the NATO Convention. They were terrified at the implications of such a development.

Within hours, the information was packaged into classified documents and conveyed to the Joint Chiefs of Staff. The Joint Chiefs examined the information while they were being briefed by the AWAC's crews which had witnessed and recorded the events. After the briefing, the crews were dismantled, and their various members stationed far away from one another, with orders never to discuss the events they had witnessed. Officially, the laser bursts never had occurred.

Secretary of Defense Frank Carlucci took delivery of the packet at his residence in Falls Church, Virginia, three days later, at a private, secret meeting held in the middle of the night. No one has yet adequately explained why the Joint Chiefs waited three full days to brief the Secretary. Early the next morning, he was driven in a specially prepared bulletproof limousine to the White House. He personally delivered the information to the new President of the United States, Ronald Reagan. The content of the Secretary's report had an immediate, measurable impact.

It was this series of events which principally precipitated the Strategic Defense Initiative, a program of military defense and reprisal based on America's state-of-the-art satellite-borne laser-optical and particle accelerator technologies. The S.D.I. system was intended to provide the U.S. with a meaningful deterrent to further aggressive use of the technology developed by the Soviet Military.

There was only one problem with this system, aside from the fact that its astronomical costs almost bankrupted the American economy: it did not work. S.D.I. was designed to respond to a kind of technology which was not achievable in the West, and which could not be explained by any of the models, materials, technologies or sciences known in the West.

In 1985, the top-secret military version of the space shuttle, code named Atlantis, embarked on a special orbital mission. One of its mission assignments was to retrieve, examine or photograph the military spy satellites which had been disabled by the laser bursts recorded in 1979-84. The results of this investigation have not been declassified or released in any but the most censored version to the public. What we do know for certain, as a matter of publicly available non-classified information, however, is that each of the disabled satellites appeared to have had at least one, and in some cases as many as four or five precisely measured holes, approximately the size of an American silver dollar, melted completely through them from the outside.

The photographs taken of the satellites show evidence of intense heat, charring and carbonized residue evenly distributed around the perimeter of each hole. The evidence is clear and unmistakable – the satellites were disabled by a coherent beam of some sort, characterized by such intense energy that it was possible to melt consistently measured holes through the exterior and interior components of American military satellites, after having passed through the atmosphere of the planet and into space for as many as 325 miles. Such a thing has scarcely been dreamed of by the American military, much less put into any but the most nominally effective operational form.

After more than ten years of political, economic and technological wrangling, and after the expenditure of more than one hundred twenty billion dollars in largely ineffectual research and development efforts, it is inescapably clear that no amount of money or political pressure, no amount of geo-political posturing or economic sanctions was going to compel the disclosure or replication of the technologies which produced the results photographed over the Carpathian Mountains and the Afghanistan deserts. The Soviets had developed a weapons system which was so revolutionary that it could not be explained, replicated or defended against.

The Reagan Administration's lack of specificity about the nature of the implied threat to which S.D.I. was supposed to respond subjected the Administration, the Defense Department and the R&D proponents of the most prominent American aerospace corporations to an endless barrage of charges by the Press and the Congress. They were characterized as being disingenuous and accused of being unreasonably secretive during successive appropriations battles in the Congress.

The truth of matter is that the Administration and the Pentagon were not being disingenuous at all. They simply could not admit to the American public that they were attempting to develop an effective response to a weapons system which they did not understand and could not replicate.

There are a number of issues intrinsic to this set of circumstances, along with several dozen others which, though less well known or economically dramatic, are no less important from a technological standpoint. It is certain that the implication of these technologies has not been lost on those multi-national corporations whose entire capital structure may be threatened by the new sciences, technologies and materials which have been developed in secret laboratories, hidden in caverns excavated beneath the Carpathian Mountains, in the former Soviet Union.

Over the past decade the West has enjoyed occasional gratuitous glimpses into the heart of Soviet science. Attempts to disclose or discuss these developments in the press have been ruthlessly suppressed by powerful special interests vested in both the public and private sectors.

The science which underlies the series of events recounted here remains at the outer limits of the most advanced technology of which the West is capable. The questions posed by the military and corporate analysts about this laser beam weapons system are far-reaching in their scope and implications. Some of them are illustrative:

1) New Model of Quantum Mechanics: The sciences and models of quantum mechanics which produced such stunning recent developments in the West as the laser and maser make quite clear how much energy is required to create a beam of coherent light powerful enough to penetrate the atmosphere, retain its coherence in spite of atmospheric diffraction (and other effects described in quantum mechanics as "thermal blooming"), and melt a two-inch hole clear through a satellite made of the most sophisticated alloys ever produced in the West. Except for limited short-distance demonstrations conducted with industrial grade lasers used in cutting operations, there is no known combination of materials or technologies extant in the West to make such a thing possible.

2) New Materials: The materials necessary to create an electrical charge large enough to power a device capable of producing such a beam certainly do exist. In quantum mechanics the term large enough does not make sense, but we can agree for the purposes of this discussion on the effect of it as represented by such commonly accepted constructs as frequency, voltage, current and ionic flow rates [as distinguished by the phenomenon of resistance].

Hydroelectric plants and large, fixed-base nuclear power plants are capable of producing enough energy to theoretically power such a device. But the energy bursts in both the Carpathians and the Afghan desert were generated by sources which moved from one location to another. In order to do that, several additional considerations must be addressed:

a. Portability: The power source would have to be transportable or be capable of storing sufficient energy to repeatedly power such a device. Western technology cannot produce either a portable power production unit or energy storage system capable of the performance requirements everyone agrees must be met to make the weapons system work, either in the laboratory or in the field. System portability was the most puzzling feature of the NSA/DIA report.

When carefully analyzed, the computer-enhanced enlargements of the photographs taken by the spy satellites and AWAC's crews failed to provide evidence of any tracks which could be attributed to wheeled or tracked vehicles operating in the precise locations and at the same time as the laser bursts which were observed. The implications of this set of circumstances was almost too much to believe – the devices were apparently either hand held or transportable and rechargeable in such a way as to allow them to be transported by one or more foot soldiers, without vehicular support.

b. Enormous Power Requirement: The materials and technologies used to construct a device capable of generating a beam of such enormous power and magnitude would have to be sufficiently advanced to enable the components to be transported without damage over significant distances in unpaved areas of very rough terrain. Such strategies, engineering techniques, construction technologies or materials do not exist in the Western inventory.

c. The continuous repetition of the laser bursts suggests that the devices can be operated repeatedly at short intervals of 12-15 minutes. This means they can be triggered with significantly higher frequency and intensity than anything which can be produced in the West, even for laboratory use. Industrial strength lasers used to cut metals require careful setup, accommodate only limited use in short bursts, require extensive cooling and must be continually recalibrated. These limitations obviously did not apply to the devices being operated in the Afghan desert. Analysts at AMTL agreed that the units would either have to be recharged via an external, independent device or somehow be capable of self-recharging in the field.

Such a thing is almost unthinkable by current Western military standards. Not only can we still not replicate the technology in any meaningful form, but the Soviets had refined the technology to a point which allowed it to be carried on the shoulders of ordinary foot soldiers and recharged in the field without motorized support.

Unbelievable! How was such a thing possible? According to some of the highly qualified scientists who scrutinized the photographs, it is not possible. The "Not Invented Here" syndrome is alive and well in the American engineering community. Some of them still insist that the pictures were either fabricated or demonstrate something completely different than this narrative suggests.

3) Energy Recharge-Batteries: How did such high-intensity laser beam generators get recharged in the middle of the Afghan desert, in the absence of powered support vehicles or fixed-based power plants? There are a number of possible alternatives. They could have been powered by some sort of advanced battery technology. It's possible, but if the battery technology used in the West is used as a model to support such a thesis, it would take a bank of the most sophisticated batteries ever designed by NASA, arrayed in series and parallel configurations larger than five full-sized Soviet T-60 tiger tanks to power such a device.

This theoretical battery bank, operating at 100% efficiency (which is not practically or theoretically possible; the best batteries manufactured in the West operate at less than 60% discharge efficiency), could conceivably produce enough direct current voltage (in a zero resistance super conductive circuit, which is not possible, either) to perhaps produce one burst of light equal in intensity to 20% of the power required to burn a 2-inch hole through a satellite moving at 20,000 miles per hour at a distance of 325 miles. Soviet ground forces were generating bursts of this magnitude every 12-15 minutes for more than 10 hours with nothing but ground troops. During eight hours of this exchange, it was totally dark. Something pretty remarkable must have been going on to make such a thing possible.

4) Energy Recharge – Solar Cells: Another alternative would have been to have whatever energy storage devices were being used to power the "laser cannons" recharged by sunlight. The state-of-the-art in photo-voltaic cells produced in the West simply would not support such an undertaking. The very best solar cells ever produced in the West have been produced by the Japanese.

These cells operate at a maximum of 19% efficiency - that is, they convert as much as 19% of the ambient visible sunlight shining on a clear, cloudless day into ion flow, which then becomes low voltage direct electrical current flowing through a circuit. The Japanese panels require months per section to manufacture and literally cost more than their weight in gold to manufacture. They are very heavy and are so sensitive to vibration and calibration that once installed, they cannot be moved at all.

Photo-voltaic cells capable of providing enough electricity to recharge a theoretically infinite energy well would have to operate at efficiencies of 50-80% to recharge batteries of infinite electrical capacity with enough power to trigger such a device. Such cells would have to be very light weight and able to withstand extremes of heat, cold, vibration, dust, wind and other conditions encountered in a hostile battlefield environment. Nothing like that exists in the Western technological arsenal.

5) Dielectric Materials – Transformers and Capacitors: Another consideration must be reconciled before this issue can be theoretically put to rest. In order to produce a burst of coherent light of sufficient intensity to have the effect which was observed and recorded by the surveillance teams, the voltage and amperage required to support such a device would have to be staggeringly high. In order to operate at all, the voltage supplied to the system must be released all at once, not in a continuous stream but in a single coherent burst so intense that any materials known in the West would either evaporate or melt. Not only would the best dielectric materials known to Western Science melt because of the heat produced by such enormous energy bursts, but before a bolt of energy of this magnitude could even be released to such a device, it would have to be accumulated and stored somehow.

A similar set of requirements of a less dramatic type is present in all the electronic devices manufactured and marketed in the West. This includes the entire range of electronic devices such as VCR's, computers, televisions and sound components, telecommunications, information storage, transmission and retrieval systems of every kind. We could not live as we do without them. The components which convert, store and release ion flow into the circuitry of these devices are known as transistors, transformers and capacitors.

This discussion delves into a slightly technical area here, so non-scientific types will need to either become familiar with the fundamentals of electricity to understand what is meant or simply give it a possibility that what is developed in the next section is a true representation of the way such things actually operate. The discussion deals with such commonly used and seldom understood concepts as voltage, current, frequencies and resistance.

(a) Transformers convert voltage at one level of current (amperage) to either higher or lower voltage levels. When the voltage is increased, the amperage or current is proportionately decreased. A low voltage produced at a high current level can be transformed into a much higher voltage at a proportionately lower level of current or "power."

(b) Capacitors: The decrease in amperage which accompanies a transformation of low voltage to higher voltage is often compensated for by a device known as a capacitor. In the most simplistic terms, capacitors "store" electrical energy until the amount of voltage and current reach a certain minimal threshold. When that point is reached, the entire store of energy is released all at once in a single burst.

The tantalum materials used in the West to manufacture such devices conform to certain standard rules which are commonly accepted by electrical engineers. These rules have only recently been stretched by new technologies and materials developed in the West. For the purposes of this discussion, though, it is safe to say that electrical engineers have long relied on these rules because they have always produced the same results when applied in the same way. Here's an example.

It is standard engineering fare which dictates that a transformer capable of accommodating one volt at one ampere of current across a grid of one ohm of resistance will be one cubic meter in dimension. If followed to its logical conclusion, this standard rule of electrical engineering would require that a transformer capable of supporting a laser burst device of the kind operated by the Soviet ground forces in the Afghan desert would have to be approximately the size of a building built on a base 100 feet to a side, nearly 150 feet high.

Surely such a device could not have been hidden from the AWAC's eye in the sky which can clearly photograph the letters on a license plate from 60,000 feet altitude, nor could it have been moved on the shoulders of ground troops without wheeled vehicular support. The fact that there was absolutely no trace of such a huge, massive transformer device (or any other kind of structure or vehicle which could be construed to serve that purpose) means that something else must have been used instead. Military analysts had absolutely no idea what it could have been.

Such a burst system cannot operate without a capacitor of some sort. A capacitive device capable of storing the amount of energy required to power a single burst from a laser cannon, made of the most advanced dielectric material known in the West, would have to have been equally massive and, further, would have to have been cooled by some sort of strategy which would have been instantly and unmistakably detected by the infrared cameras and spectroscopic scanners used aboard the AWAC's and the spy satellites which investigated the scene.

The practical requirements of such a system are best demonstrated by the massive equipment required to operate and cool the Super Conductor Super Collider linear particle accelerators recently designed by the United States and Japan. No evidence of any such capacitive device was recorded in either the Carpathian Mountains or the Afghanistan desert. How can we explain it?

Without going into any detail about how the technologies were developed, suffice it for now to say that the Soviet ground forces in Afghanistan were equipped with a prototype of a hand-held plasma beam accelerator, the likes of which had only been roughly imagined by American military analysts. The device relied on some innovative strategies. Among these were:

Energy Storage Devices: The power source for the Soviet light cannons was comprised of a back-pack array of specially designed energy storage devices. The closest thing we have in our vocabulary to compare to them is described by the term "battery." In the limited sense that these devices store electrical energy, they are batteries. Any other similarity to the batteries we are accustomed to in the West ends there. The literal translation of the Russian name for them is energy accumulators.

The batteries relied on in the West are based on the chemical properties of components which, when combined in certain configurations and proportions, interact chemically with one another. The result of this chemical interaction is that it creates both heat and a stream of liberated ions – electricity. In dry cell batteries, the process of chemical interaction is one way – once they have been expended, they are simply disposed of. It is estimated that more than 12 billion expended dry cell and lead-acid batteries are dumped into America's land fills every year.

Other batteries are designed and constructed so that the chemical reactions which liberate electrical current are reversible in some degree. These rechargeable cells are characterized by the lead-acid batteries which are used in automobiles and in commercial and industrial applications. Various strategies have been developed to make batteries relying on chemical reactions maximally effective, but the theoretical limits of effectiveness of such devices have surely been reached.

A consortium of aerospace companies working with NASA recently announced the development of an advanced sodium-hydride-based rechargeable cell which is the most efficient battery yet invented in the West. Unfortunately, it operates at an ambient temperature of 2000 degrees centigrade and, if allowed to reach temperatures outside a very narrow safe operating zone, will explode with the force of a small thermo-nuclear device of approximately ten-kiloton yield. It is not safe, but it is the best Western science has come up with.

The energy storage device developed by the I.N. Frantsevich Institute for Problems of Materials Science (IPMS), Kiev, Ukraine, works on a completely different principle. Its construction is the result of a completely unique nonlinear quantum mechanical model which makes it possible to create crystalline lattices of absolutely pure carbon (and other materials) in sheets of infinitely variable dimension which are exactly one molecule thick. The crystal formation techniques and the whole body of new science which allows for their creation in the first place are completely unknown to Western science.

The mono-molecular sheets deposited by this technique are wrapped back and forth on top of each other, more than one million times per millimeter, and are separated from each other by a distance of less than one atomic diameter. At this level of construction, the material becomes subject to the rules of quantum mechanics which are almost entirely probabilistic. That means a whole atom of carbon (or almost anything else except an electron or photon) will not fit in the space which separates the lattice sheets.

When viewed under an electron microscope, the sheets produce a pattern which looks for all the world like an endless field of four-sided pyramids, connected base to base, on a single plane, with the tips of the pyramids protruding endlessly, uniformly upwards. When wrapped back and forth on top of each other, these sheets of pure carbon crystal, made of carbon molecules shaped like trillions of identical tiny pyramids, all arrayed endlessly in identical formation, are positioned so that the tips of the pyramids on the bottom sheet are matched with the tips of the pyramids on the top sheets. What remains between the pyramid tips are open "spaces" or energy wells.

The quantum physics which describes the characteristics of the energy wells created between the layers of crystalline lattice is largely unknown to Western physicists. The Soviet model predicts with a high degree of probability that the quanta of energy referred to in the West as electrons (and, in some cases, photons), the stuff of which electricity is made, will, when introduced to the lattice structure, search, find and fit into the energy wells with military precision.

During the recharging or loading phase, the energy storage devices made of the crystalline lattice material channel one electron at a time into each well created by four carbon pyramids on the bottom layer and four carbon pyramids on the top layer. Because the rules of quantum mechanics which operate in this tiny environment demand it, each electron or quanta of energy has a certain polarity, spin and "color" (and other mathematically defined characteristics) which must be accommodated if it is to find, fit and stay in an energy well. Interestingly enough, when a current is applied across the lattice-work structure, the electrons behave precisely as nonlinear quantum mechanics predicts they will. They flow much like a fluid into the lattice field, then separate into individual energy quanta and spin into the last energy well in each layer, automatically adjusting their individual spin, polarity and color to match their characteristics to fit the requirements of each well, until the lattice is full.

Because no chemical reactions are involved in the process of marching electrons into or out of the energy well fields, there is no resistance in the circuit. In the absence of resistance, the electrons fill the wells at light speed, never missing a space, automatically adjusting polarity, spin and other characteristics, and creating no heat. The amount of time required to "charge" such a cell is less than 5% of the time required to recharge a conventional chemical battery of similar voltage and current.

The validity of $E = MC^2$ is called into question by the way these devices function. When the battery is fully charged, it actually demonstrates more mass than when the energy storage device is empty or discharged. The laws of quantum mechanics relied on in the West state categorically that this is not possible. It is the answer to the question, "How much does a beam of light weigh?"

According to the Soviet model, this is precisely as it should be. When this phenomenon was first demonstrated to scientists in the West who were testing the energy storage devices at INEEL in Idaho, they were thunderstruck. The quanta of energy, or electrons as we refer to them, which are poured into the crystalline lattice demonstrate characteristics of mass even though they are bundles of pure energy sitting in stasis, literally at rest. The characteristic of mass is verifiable – you can measure it by weighing the energy storage devices before and after they are charged. When they are charged, they demonstrate appreciably more mass than when they are fully discharged.

If this is confusing to you, to suggest that pure energy can be shown to demonstrate verifiable mass while at rest (in stasis), perhaps you can begin to appreciate how fundamentally different the physics of all this is when viewed in the terms of Einstein's classic equation $E = MC^2$.

The existence of this technology clearly is proof positive that not only does energy demonstrate the characteristics of mass, but it does so in a state of non-motion or stasis, sitting idly in an energy well. A state of stasis is a very far cry from the terminal theoretical velocity required by the constant in Einstein's equation, equivalent to the square of the speed of light.

The scientific implications of this phenomenon are truly staggering. At very least, the verification of mass as a property of energy quanta at rest suggests that Einstein's theory of relativity may be altogether incorrect as a means of describing the dynamics underlying the real nature of the material world and its relationship to energy.

The existence of this technology suggests, at very least, that energy and mass are equivalent characteristics of all things which are manifest in the material world. It is this fundamental contextual difference which distinguishes the Soviet model of quantum mechanics from the Western model. “The proof of the pudding,” they say, “is in the eating.”

Theoretical physicists may argue endlessly about the validity of the assumptions relied on by the IPMS scientists to develop their unique sciences, technologies and materials. But they cannot argue about the existence of the materials which have arisen from that context. They are as real as they can be. And they are unlike anything ever seen or contemplated in the West.

In the same way energy quanta stored in the energy wells of crystalline lattice materials demonstrate complete mathematical satisfaction with staying there indefinitely, when allowed to flow out in the form of an outgoing wave of electrical discharge, these quanta (electrons or photons, as you prefer) march right back out without resistance at light speed through a closed circuit to another use.

When these energy storage devices are discharged, they demonstrate other attributes which are not known in Western science, and which, because of the very nature of the chemical reactions we are accustomed to, are not theoretically possible according to conventional wisdom. Conventional chemical batteries, when fully charged, produce electric current at a useable voltage for perhaps 30-40% of the total discharge cycle. After that, either the voltage or amperage (or both) drop to low enough levels that the devices being powered by them cannot recognize or use the electrical current which remains available. At that point, the batteries either have to be recharged or replaced.

The crystal lattice batteries have been demonstrated to produce precisely the same current and voltage levels throughout 98% of their discharge cycle. They produce no heat during discharge, regardless of the rate at which they are discharged. This is absolutely contrary to our experience with batteries, transformers or capacitors. Until the crystalline lattice materials were specifically engineered to register an electronically detectable blip at 95-96% discharge, it was impossible even for the scientists who developed them to distinguish a partially discharged battery from a fully charged one.

There is another characteristic which is intrinsic to energy storage devices which comes into play here. It is a characteristic of materials which is described as energy density. For non-scientific readers, this concept can simply be construed to mean the amount of measurable electrical current which can be produced by any device or material when its mass is converted into electrical energy. The concept is expressed in mathematical formulas as the number of watts and hours of consumable energy which can be converted from each kilogram of material. It is expressed as watt-hours per kilogram.

Here is an example we can all understand. Consider gasoline. When converted into electrical power at 100% efficiency, gasoline has been theoretically shown to have an energy density of between 550 and 600 watt-hours per kilogram of mass. In easy terms, that means that if one kilogram of gasoline were converted into pure electricity at 100% efficiency (with no loss due to heat, resistance, waste, etc.), the reservoir of energy would power a 100-watt light bulb for 5.5 to 6 hours.

Most of the high-end conventional automobile batteries of the lead-acid variety operate at an energy density rate of between 20-25 watt-hours per kilogram. The best NASA sodium-hydride batteries operate at 48-50 watt hours per kilogram. The energy accumulator devices which have been tested at the Idaho National Electronic Laboratories have demonstrated energy densities of between 850 and 1050 watt-hours per kilogram.

What does this mean in practical terms? It means, for one thing, that for the first time in the history of science an energy storage device has been created with an energy density which is greater than gasoline or any other refined fossil fuel. It means that devices which rely on these energy storage technologies can theoretically be designed to store and deliver clean electrical power at higher rates of efficiency than any fossil fuel ever discovered.

The global implications of this technology are irresistible. It means, among other things, that the technology exists, right now, to eliminate the need to build another nuclear power plant or dam another river to produce hydroelectric power. It means we can no longer justify burning another ounce of petroleum, another piece of coal, another cubic centimeter of natural (or unnatural gas) or another tree to produce heat, electricity or power for any purpose, including transportation.

When coupled with the plasma beam devices being tested by the Soviet infantry units in Afghanistan, these energy storage devices operated at such unbelievably high rates of discharge efficiency that they made it possible to repeatedly induce huge electrical discharges in a highly mobile configuration.

The same technologies which were used to produce the energy storage devices have been adapted to create transformers and capacitors with previously unimaginable performance characteristics. Instead of adhering to the conventional western model of "One Volt at One Amp across a resistance of One Ohm equals One Cubic Meter," the Soviets have produced a capacitor which measures more than 1200 farads at 10,000 amperes in a package the size of a tuna sandwich.

When tested by the Technology Materials Testing Laboratory of the Defense Department at the Pentagon and at the I.N.E.E.L. in Idaho, totally new testing equipment had to be designed, engineered and constructed just to test the devices. The scientists at those laboratories had never tested anything like these materials before.

Instead of having to house transformer and capacitor devices in a series of trailers towed by diesel tractors or huge fixed-base facilities, the operating apparatus which supplied transformed power and high intensity capacitive bursts to the light cannons weighed less than ten pounds and could easily be transported in a backpack by a foot soldier.

One final question remains unanswered. "How did the energy storage devices, once dissipated or discharged, become recharged in the field, especially in the dark of night?"

The back-pack plasma beam device detected by the AWAC's during limited combat use in the Afghanistan desert was powered by energy storage devices constructed of crystalline lattice materials. After each laser burst, the energy storage devices were recharged every 12-15 minutes (nearly 45 minutes in the dark of night – the residual ambient heat of the desert is a very efficient source of infrared energy) by sunlight, collected and converted to electricity by four-foot square panels of "solar cell" material arrayed on a pole like a flag, each weighing less than ten ounces.

The electrical energy stored in the back-pack energy accumulators was transformed into enormously high voltages and released at almost unbelievably high current levels when the super-capacitors were sufficiently charged. The beam of "light" detected by the AWAC's crews was a field of plasma, flowing at the speed of light and demonstrating characteristics of mass (and, therefore, kinetic energy). The phenomenon represented by these bolts of lightning are not comprehensible according to the model of quantum mechanics and plasma physics currently being used in the West.

Battery packs utilizing these energy accumulator materials have been designed, produced and tested which provide more than 14 hours of continuously transmitted power on a single charge to conventional hand-held cellular telephone devices. Similar improvements in conventional battery/energy storage capacity have been developed and are being tested for such devices as video camcorders, laptop and portable computers and other similar consumer, commercial, industrial and military applications.

IPMS research in the field of layered crystals has thus led to the creation of capacitors with a very high level of capacitance (measured in farads). This technology is based on a revolutionary production technique which forms polarized surfaces of one molecule thickness, separated by less than one atomic diameter of space, held together by weak Van der Waals energy forces. The special properties created by these layered crystalline structures provide previously unimaginable internal surface areas. Super capacitors are constructed of layered materials numbering more than one million dipole sheets for each millimeter of crystal thickness.

These devices provide a virtually limitless number of charge-discharge cycles at astonishingly rapid charge and discharge rates. The potential impact of such devices on all electronic equipment currently being produced is incalculable, since virtually all electronic devices rely extensively on the West's state-of-the-art tantalum capacitance technologies.

At present, IPMS has on hand (among others) a super-capacitor roughly the size and dimension of a sandwich which develops more than 1,200 farads at 10,000 amperes. It also boasts production of a battery whose active mass energy density exceeds 850 watt-hours per kilogram. For the non-scientist (and all the rest of us as well) this means that a "battery" has been produced which, for the first time in history, produces more power per unit of mass than any fossil fuel ever devised.

Prototype testing of larger-scaled devices designed specifically for providing power to electric vehicles is currently underway. Prototypes are expected to be capable of sustained highway speeds of up to 70 miles per hour with a range of 525 miles on a single charge. The power plant for this application has been recently improved by the inclusion of a proprietary solid-state ceramic electric motor which weighs 7.2 kilograms and produces 100 horsepower on 12-volt direct current. For comparison, an electric vehicle employing a 100-horsepower electric motor performs the same as with a 500-horsepower gasoline engine.

If these performance attainments can be sustained in broad-based applications, electrically powered vehicles could be produced which would meet or exceed virtually all performance characteristics currently available in equipment relying on internal combustion, petroleum-based engines. Gasoline/diesel-powered transportation devices can be replaced by cleaner, more efficient and significantly less expensive alternatives.

The world market for current energy storage applications which will be superseded by these energy storage technologies is estimated to be in excess of $24 billion per year (1991), exclusive of electric vehicle considerations.

Joint ventures of the IPMS with more than a dozen private sector companies to develop useful energy inventions have been repeatedly sabotaged by the U.S. Government's Defense Intelligence Agency and others. (Source: David G. Yurth, *The Anthropos Files: Tales of Quantum Physics from Another World – 2nd Edition*, 2007)

IPMS: High-Temperature Gas Plasma Detonator

Since its establishment in 1951, the I. N. Frantsevich Institute for Problems of Materials Science (IPMS), Kiev, Ukraine, has been secretly developing, testing and producing more than 130 new materials in 30 general materials categories. IPMS scientists have developed a whole new science based on their unique model of plasma physics. With their invention of a high-temperature gas plasma detonator, strategic metals and other commonly used materials can literally be sprayed onto the surface of other, previously incompatible materials. These gas plasma detonation spray technologies make it possible to create permanent molecular bonds between materials which could never be married together before.

Chromium materials of an entirely new type have been developed to provide high-purity cathodes and targets. Moldable, flexible chromium (a type of material never before available) can now literally be sprayed to conform to widely varying shapes for linings (i.e., to reduce internal pipe corrosion), provide nuclear rod protection, and highly effective space hardening. These techniques have been perfected and used in practical field applications for more than 35 years.

The unique nature of these technologies may not be readily apparent to those not intimately familiar with the commercial and industrial uses of such materials. In more ordinary applications, however, the importance of being able to provide solid targets, stand-alone ingots of ultra-pure chromium, scandium, magnesium and other exotic materials, cannot be overstated. Today, the state-of-the-art in the West only allows chromium, for example, to be transported and used while in solution with other highly toxic liquids. Western scientists do not have the ability to produce free-standing ingots of any of these materials. The manufacturing models which rely on Western science make it clear that it is not theoretically possible for such materials to be produced in a free-standing form.

Similar materials coupled with the technologies of high-temperature gas plasma detonation have been developed for coating internal combustion engine parts to extend life cycle. They have been applied to enhance the performance characteristics of memory elements for computers and to support an extraordinary variety of totally new electronic circuitry. This technology has been successfully used to produce computer circuit boards whose operating components are intrinsic to the circuitry, thereby eliminating the utility or need for soldering or pin housings. The use of scandium, a very rare and exotic element available only in the Carpathian Mountains of Ukraine, make much of this possible in ways not anticipated by Western science.

IPMS-Kiev scientists have developed a series of diamond and cubic boron nitride powders which are smaller and more uniform than any other manufactured today. Also available in this family of materials are very fine (sometimes mono-molecular) ultra-high purity powders and liquids of refractory metals including chromium, vanadium, tungsten, scandium and molybdenum. These powders can literally be sprayed as a plasma field to form continuous, seamless, flexible molecular bonds with host surfaces without electrolytic processes. These materials demonstrate clearly superior performance in tool hardening, cutting edge equipment and polishing.

IPMS-Chernovitsky scientists have developed an entire family of previously unknown technologies based on woven fibers made entirely of 100% pure basalt fibers (lava rock). This totally new technology allows for the production of flexible, weave-able threads. These fibers are fundamentally resistant to heat, demonstrating a softening point in excess of 800 degrees centigrade. Fibers of this material have been produced in diameters of less than 3 microns (millionths of a meter), more than 10 times smaller than a human hair.

Allied Signal Corporation in the United States has attempted unsuccessfully for more than twenty-five years to produce a single fiber of a similar type material. Today, the Ukraine has the capacity to produce these raw fibers at the astronomical rate of 100 tons per month.

These materials are currently being produced in applications involving brake shoes and clutch plates with extraordinary performance characteristics. These materials sustain only about 15% of the wear currently attributed to asbestos-based materials used in identical applications, with the added advantage that they are environmentally friendly (non-toxic and non-polluting). In current applications, parts fabricated of basalt fibers actually operate at higher efficiencies as surface temperatures are increased, up to operating temperatures exceeding 800 degrees Centigrade.

Basalt fiber materials have also been shown to demonstrate superior insulating capabilities over commercially available materials in applications involving both temperature and sound. They have been used in applications related to mine roofing, trays of water cooling systems and as both gas and fluid filters. A four-inch deep pile of 5-micron filaments has been shown to demonstrate heat insulating properties in excess of R-65, which is nearly four times the efficiency of glass fiber equivalents, at one-half the weight.

Further, basalt fibers have been woven together with threads of tungsten, chromium and other strategic metals to produce cloth materials with previously unheard of characteristics. Woven metallic threads and fabrics of this type have never before been produced anywhere in the world.

This writer, Gary Vesperman, has included in his “Advanced Self-Powered Electric Vehicle Concept” (see http://iiic.de/docs/GVShortSummaries1-46a.htm) a monocoque (unibody) basalt/carbon fiber foam body/frame. The IPMS-manufactured basalt/carbon fiber foam is extremely strong yet lighter than fiberglass. A test vehicle made with basalt/carbon fiber foam parts was reportedly the only vehicle ever tested that can cut through a cast-iron London taxicab in a collision.

To utilize this technology to create an automobile enclosure, three technologies are needed:

1. The basalt fiber technology can only be found at the IPMS. There may still exist some spools of the stuff in or around Kiev. The principal value of the material is that it has a softening temperature of 805 degrees centigrade.

2. The Russians use powdered metallurgy to alloy their strategic metals – the ideal mix of metal powders would be aluminum and magnesium. Since both can be found in finely particulated powders and when mixed together in the right ratios, these two metals form a material which is utterly resistive to corrosion and which has excellent tensile strength.

3. The powdered metals are mixed in a chamber like dry cake mix and then applied using a third technology – in IPMS documents, this technology is referred to as a "High-Temperature Gas Plasma Detonator". The metal powder is poured into a ceramic container, which funnels it into a specially designed high-temperature containment vessel which is also surrounded by super magnets (see IPMS-Kiev and Arzamas-16: Super Magnets elsewhere in this energy invention suppression compilation), arranged in a very precise order to create a compressive effect. When the powdered metal is brought into the chamber, high voltage, high pressure and extreme magnetic fields reduce the metal powder to a plasma, which is then expelled through a nozzle and onto a target – in this case, the woven basalt fiber which creates the shape of the vehicle.

When the metallic plasma collides with the basalt fiber material, it has a temperature of about 1600 degrees centigrade. This causes the basalt fibers to soften and partially melt – but the cooling gradient for this material is so steep that it cools almost immediately below 800 degrees centigrade, at which point the fibers reconstitute. This creates a basalt fiber-reinforced metal-alloyed shell which is extremely strong, very light weight and can be polished to a high sheen.

This is the technology the Russians have used for 35 years to create fuel cells for their huge rocket boosters – and it is the reason their boosters are so light, have no gaskets or seams and can be reused over and over again. It is primarily because of their extensive use of these integrated technologies that the Soviet space program has been able to consistently deliver larger payloads into orbit that any other nation since the space race began in 1957.

Joint ventures of the IPMS with more than a dozen private sector companies to develop useful inventions have been repeatedly sabotaged by the U.S. Government's Defense Intelligence Agency and others. (Source: David G. Yurth, *The Anthropos Files: Tales of Quantum Physics from Another World – 2nd Edition*, 2007)

Remy Chevalier (Reporter): NiMH Batteries; Solid-State Lithium-Ion Batteries

The best Nickel Metal Hydride (NiMH) batteries are no longer on the market. Why? Because either Cobasys has no intention of ever mass producing powerful NiMH automotive packs, or they just don't know how, even though they own the patent. The cells they displayed at the last EDTA conference were bulky at best, and certainly a million years away from the level of engineering exactitude Japanese automakers expect from their suppliers.

Essentially Matsusita took some of the information from their original, but mediocre patents and developed a functional NiMH battery that gave a range of 160 miles to the General Motors EV-1 and 110 miles to the Toyota RAV4 EV. This Panasonic M95 was also getting 1-2000 deep cycles and 100,000-150,000 miles on a battery pack. Something the oil companies and Detroit automakers don't want on the market, despite the Fortune 500's good mood for natural capitalism.

So now that the best NiMH battery technology for EV's has been removed from commercial circulation, Toyota, Honda and Ford are stuck using inferior NiMH battery technology in their hybrids. Toyota has indicated it will take up to 4 years for the next generation lithium-ion (Li-ion) battery chemistry to be as reliable and affordable. Till then, it's touch and go as Toyota can't crank out enough hybrids off the assembly line to meet demand, especially in deliveries to corporate fleets, taxicabs and limousine services.

State-of-the art lithium-ion chemistry is in limbo at some California-based company who has managed to secure the exclusive production rights to the only Li-ion technology that really counts, roll-to-roll solid-state battery production. That's right; no more liquid chemistry… no leakage, no over heating, no explosion, extreme light weight, easy mass production! Just like printing mylar off a printing press! Just like laminating plastic photovoltaic sheets!

Instead more conventional liquid Li-ion chemistry is being pushed feverishly. Toyota is buying out major Li-ion startups in Asia. Other Li-ion battery companies like Valence, Electrovaya, Kokam, LG Chem have attractive polymer Li-ion batteries, but they are still all based on the older liquid chemistry model, and therefore more expensive and more complicated to produce.

The chemical genius who came up with the Li-ion solid-state polymer roll-to-roll protocol is a professor at MIT who does not own his own technology. MIT owns the technology, and it is the MIT licensing office which gets to decide what companies do or do not get awarded these licensing rights. This revolutionary technology has been in limbo since 1995!

Is it because MIT is cashing checks from the Rockefeller Bros. and the Ford Foundation? Is it pure incompetence? Is it a repeat of the cold fusion debacle Gene Mallove wrote about in his book "Fire from Ice"? It's hard to tell as everyone involved is terrified to talk about it openly, which is why I am not mentioning any names. Frequent visitors to the Electrifying Times website know exactly who I am talking about!

My suspicion is that certain forces within the military, and now Homeland Security, do not want solid-state roll-to-roll Li-ion batteries from entering the civilian marketplace, the same way you can't buy Green, a special duct tape developed for Groton Electric Boat workers to strap metal parts, so strong it instantly bonds to the skin, requiring surgery if accidentally touched.

What a poor boy to do who wants to save the planet if the powers-that-be won't give him the affordable batteries he needs to make a 0 to 60 in under 3 seconds EV with a 200-mile range on a single charge? That's the question we should all be asking ourselves instead of lamenting about who killed the electric car!

The batteries are there, being manufactured for military applications all over Connecticut! If you want plug-in hybrids and 100% pure EVs so you don't ever use a drop of gasoline again, with equal to if not better performance than any liquid fuel engines, then ask yourself why MIT, since 1994, has done very little to get their solid-state Li-ion roll-to-roll battery patents into production. Don't follow the money; follow the trail of misappropriated and shelved patents.

Congress needs to put back into question the entire review process of patent law, and its consequences on environmental health, by imposing strict fines to whoever is caught buying patents for the sole purpose of keeping its protocol out of commercial circulation. (Excerpted from "Who Killed Better Batteries?" by Remy Chevalier, *Electrifying Times*, spring-summer 2006, Vol. 10, No. 1, www.electrifyingtimes.com.)

(Erik Masen adds more details in his "Suppression of Quantum Leap Inventors" *Electrifying Times*, 2007, Vol. 10, No. 2)

Chevron-Texaco bought into a Detroit company, Stanford Ovshinsky's Energy Conversion Devices (ECD), and changed their name to Cobasys. ECD held the original patents on nickel metal hydride battery technology, but never successfully marketed a turnkey NiMH battery for major markets. They did sell a considerable amount of NiMH batteries to GM for the EV1. Panasonic came along and refined this NiMH battery technology into an indestructible battery of higher energy density and longer life. That enabled the Toyota RAV4 EV (electric vehicle) to get 80-120 miles out of a battery cycle, and get over 100,000 miles of battery life out of this improved NiMH battery. ECD-Cobasys filed a lawsuit of patent infringement against Panasonic and won. This action essentially shutdown the import and use of the Panasonic M95 NiMH battery that was so successful in making EV's practical for the GM EV1, Ford Ranger Electric PU, and the Toyota RAV4 EV. As a result the proven very popular M95 90-ampere-hour NiMH is not for sale in the United States. ECD-Cobasys also put heavy licensing fees and restrictions on the NiMH battery used in the Toyota's present hybrid fleet.

Paul M. Lewis: Airmobile

In 1936, Paul M. Lewis designed a three-wheeled car that looked a lot like the present Volkswagen bug. He called it the "Airmobile", and his original model is still on display at Harrah's auto Museum in Reno, NV.

Though Lewis had not known what Dr. Ferdinand Porsche was doing in Germany, the Lewis Airmobile was amazingly similar to the popular VW beetle.

Both vehicles were low cost, simplistic in design, used horizontal opposed four-cylinder air-cooled engines, transaxles, independent suspension systems and unitized body construction.

When World War II came along, it sent VW soaring in Germany, but killed the Airmobile. Porsche fit into the German establishment, but Lewis was a "crackpot" inventor and a pain in the neck to the economic status quo.

The VW beetle's popularity proves that Lewis' original idea was valid and worthy, despite the laughter from Detroit.

The Airmobile was driven out of business in the late 1930s by the Securities and Exchange Commission and the U.S. Postal Department, who have been called bureaucratic flunkies for the oil-auto monopoly.

"I was harassed for two years, and they refused to let me sell stock in my company on the pretense they were investigating possible wrongdoing." Lewis said. "After I was beaten down, they sent representatives to tell me they found nothing wrong, and I could sell stock. A man can't make a dead horse walk."

After losing the Airmobile, despite driving it through 26 states for more than 45,000 miles without a repair, Lewis went from Denver to Los Angeles, where he continued inventing.

Joel McClain and Norman Wooten: Magnetic Resonance Amplifier

On December 12, 1994, Joel McClain and Norman Wooten, two Dallas inventors, discovered that a magnetic resonance amplifier could be capable of over-unity gain energy conversion. The electrical output of their prototype was five times the electrical input. They made a point of publicizing their invention as widely as possible via the Internet right away so as to forestall possible suppression. Since then, they have authored articles on the magnetic resonance amplifier in Electrifying Times, Extraordinary Science, and New Energy News.

A personal friend of Newt Gingrich became very interested and arranged for the Physics Department at Georgia Institute of Technology to experiment with it. They were able to increase the gain so that the output is 18 times the input. Since they could not explain this according to conventional physics, they refused to publish their results for fear of losing the respect and esteem of their peers.

Gingrich had been following the MRA with keen interest so when his friend told him of the problem with Georgia Tech, Gingrich arranged for the federal funding of Georgia Tech programs to be cut off. The President of Georgia Tech who had been in the dark on all this began getting phone calls from enraged Georgia Tech professors. Then the Physics Department published their findings.

At the International Tesla Society Symposium in Colorado Springs (July 20-23), McClain and Wootan gave a lecture on their magnetic resonance amplifier. The oscilloscope waveforms of output vs. input they showed were very odd. They sort of loop around themselves.

A few days after the conference, Wootan's two-year-old boy had been abducted, Wootan was running for his life in Canada, and McClain was in hiding.

The magnetic resonance amplifier's claimed over-unity power conversion efficiency was later shown to be a measurement error. However, a past issue of *Electrifying Times* claims that Scott McKie has invented a solid-state over-unity electrical energy converter with an input of 15 volts, .438 amperes (7.25 watts) and an output of 34 volts, 127 amperes (4318 watts). McKie's converter apparently is a more advanced version of the magnetic resonance amplifier.

Al Wordsworth: Electrical Generator and Advanced Carburetor

The details are sketchy and second-hand, but inventor Al Wordsworth had to contend with harassment of both his advanced carburetor and electrical generator. His generator had an input of 3 amps at 12 volts and an output of 32 amps at 6 to 8 volts. He died some years ago. It is believed his generator design is lost.

John Richardson: 90+ MPG Carburetor; Atomic Isotope Generator

John Richardson invented a "carburetor improvement/adjustment mechanism" which enabled autos to achieve 90 to 100 miles per gallon of gasoline. Richardson also invented an "atomic isotope generator", about the size of a washing machine, which could electrify a 5,000 sq. ft. house or building for over 100 years at a minimal up-front cost. Vicious threats from big business to his life and his family persuaded Richardson to hide the prototypes and to stop further work. (Source: http://center-for-natural-health.com/articles/richardson.html)

Fish/Kendig: Variable Venturi Carburetor

In the late 1950's the Fish/Kendig Variable Venturi carburetors got some very interesting mileage figures. John Robert Fish had invented a carburetor that double the gas mileage of Detroit's standard carburetors. When Detroit snubbed his invention, Fish tried selling his invention through the mails to do-it-yourself mechanics. The Fish carburetor even got into production on a small scale.

He was growing successful when Post Office Department agents swooped down on him for "investigation of fraud". Several years later he was exonerated of any charges. But until then the mails to and from his business had been stopped during the lengthy "investigation". He was wiped out financially.

In the early 1970's a young college student (name unknown) entered his Mercury "gas hog" in the California Air Pollution car race and won hands down. He was using the Kendig Variable Venturi carburetor that a small company (name unknown) had manufactured in Los Angeles for racing cars.

Within a week the student was told to remove the carburetor since it wasn't approved by California's Air Resources Board (CARB). His car had reduced pollution and doubled the gas mileage (for that model). This may have been suppression conducted by the Air Resources Board. The movie "Who Killed the Electric Car?" accuses CARB as one of the "gang of killers" of GM's EV-1 electric car.

Dick Belland: 100 MPG Carburetor that Runs on Gasoline Fumes

In 1979 Dick Belland and his brothers and a nephew were experimenting with an automobile carburetor which ran on gasoline fumes. They stopped when Belland received telephone threats to be fitted with a pair of cement boots. For story see http://www.byronwine.com/files/Dodge%20truck.pdf.

Ron Brandt: 90 MPG Carburetor

Ron Brandt is the inventor of the perm-mag motor. He is now of retirement age. He has personally told this writer, Gary Vesperman, that he is scared of working on over-unity free energy machines.

When Brandt was a young man, he invented a 90-mpg carburetor. He was paid a visit by a man from Standard Oil, another man, and two men wearing U.S. Government Marshal uniforms. They told him that if he ever made another carburetor, they would kill him, his wife, and two young children. Brandt was quickly persuaded that his life wasn't worth a "damn" carburetor. He happened to think to memorize the badge numbers of the two US Marshals and so had an attorney in Washington, DC check with the US Marshal's office. They had no record of the two badge numbers.

Welton Myers: Myers' Efficient Carburetor

Welton Myers, Director of Technology for Pure Energy Systems, does not have a resume, as he has always been self-employed.

I, Sterling D. Allan, received the following information from him via phone interview today.

Though Welton attended Cornell University, with a major in Agricultural Engineering, that is not of significance to him. It didn't take many years before he came to the realization that the mainstream science he learned there is full of errors (techniques deplete soil of nutrients). He completed there in approximately 1954.

From 1954 through 1960, Welton farmed (mainly corn) and raised 50 dairy cows. Towards the end of that time he also dabbled in logging and mining.

From 1960 through 1975, he laid the foundations for what today is known as Habitat for Humanity. He set up non-profit programs in New York and California, taking groups of ten families who helped each other build homes, and learned skills in the process, which they could later use in a trade.

He helped build and renovate over 1000 homes during this time. Better Rochester Living is the name of the first program in New York, and Self Help Enterprises (SHE) was the name of his first program in California.

In 1975, he began building homes for profit when his funding dried up for the non-for-profit program he was doing. He built around 25 homes in the $100k range.

Then in 1978 he had a serious accident that put him out of commission for physical labor until 1984. He was rear-ended by a car going 120 mph. "This was one of my most creative periods" he said, ironically, because it was also during this time that he had a very difficult time remembering the simplest things.

That was when he did the carburetor project in which he transformed a car to get three times the mileage. The organization he founded along with Bill Cope, "Knowledge is Power," held weekly seminars at Robert Wesley College, where people came to learn how to convert their cars to get three times the gas mileage.

That project came to a halt when his car was sabotaged, the pressure release valve being clamped down tight, causing his car to explode while he was driving it. The next day, as the car sat on blocks in his drive way, a trailer pulled up, and some men who told Welton's wife they were hauling the car for Welton (not true), towed the car away; and Welton never saw it again.

The blueprints are held by an associate today, but Welton does not recommend the design because of the high pressures involved (3000 – 6000 PSI), which could be dangerous if the car is in an accident.

It was also during that time (1983) that he built a magnetic motor along with Bill Cope and an inventor who said he had been involved with Tesla. The day after they announced that they were ready to open the technology to a public offering, the laboratory was raided, their equipment smashed, and their inventor was threatened at gunpoint to leave the country, which he did. That inventor had also been involved with John Searl and witnessed his flying saucer technology.

Welton later located the inventor in California, but he had Alzheimer's disease by then and couldn't remember anything.

Also during this time, for employment on the side to help cover expenses, Welton worked in a laundry designing the mechanical end of an automated system.

In 1984, Welton returned to working with COOP housing, starting with ten "slow" individuals who were not able to hold down jobs, and making a construction crew of them. At the end of two years, they built 7 homes for 7 of them. The other three were not able to get funding together for a mortgage. With some of this crew, he then went on to build more expensive homes, building 10 homes at a time, for example, in a new subdivision. Many of the homes were in the $400 - $500 range. They also installed around 100 solar panel systems during this time.

Then early in the 1990's he began to get involved in the patriot scene, helping people understand some of the inherent problems with today's tax structure, and helping them protect their assets. He was involved in Cleon Skousen's seminars with the National Center for Constitutional Studies. He learned how to create corporate shells with strong layers of protection.

Also during this time he began traversing the country meeting inventors and reviewing their inventions, to help facilitate their progress toward the market.

I met Welton about two years ago, and it was actually his phone conversation with me that spurred me to begin a "free energy" listing on my greater things website, which has grown into what it is today. We have been close friends and business associates (www.perentech.com) during that whole time.

I know Welton to be one of the brightest minds around. You would never know he's past 70 to speak with him on the phone. He remembers details of conversations and technologies better than I do, at nearly half his age. I look at him as one of the "grandfathers" of the Free Energy movement. --- Sterling D. Allan.

George Wiseman: Fuel Savers

George Wiseman is the President and Chief Executive Officer of Eagle-Research in Oroville, Washington (see www.eagle-research.com). George's research organization verifies, develops and distributes practical energy-saving methods and devices. Because he sells fuel-saving plans and devices, he of course is a target of suppression efforts that he describes in an email (copied below with deletions) that is displayed in http://www.zpenergy.com/modules.php?name=News&file=article&sid=316.

Date: Fri, 18 Apr 2003
From: George Wiseman
Subject: Re: Re: Suppression

>> I realize that 90 percent of the 'physicists' in these groups are simply here to block progress, to
>> maintain the status quo of disinfo and cointel -- preserve the monopoly of western deception and
>> newspeak – to regurgitate the same NOTHING they have been programming us with for ten decades.
>
>Do you mean the same "NOTHING" that has made possible all of the following technology that
> conspiracy addicts like you take for granted?

Whoa there... The problems and perceptions here are extreme, yet both valid in context.

I don't want to spark a big discussion, for which I do not have time nor interest. But I just couldn't resist putting in my 2 cents because I see innocence and ignorance being displayed.

There have obviously been major advances in some fields, like electronics and medical science. Much worthwhile has been accomplished. But I submit that it has either been in spite of suppression or in areas where suppression doesn't exist.

For example; computers wouldn't have been implemented to the public, bringing down their cost and fueling greater research if lone inventors hadn't developed both home computers and operating systems that would have put IBM out of business. IBM was caught unprepared and did what they could to reestablish control of the new market.

Medical science is so dominated by 'vested interest' that they are trying to even label vitamins as 'drugs'. Cures for diseases are often ignored and even actively suppressed in favor of techniques that just treat symptoms and incidentally make much more money.

In other fields we are still using technology virtually unchanged (with only cosmetic changes) for over 100 years, like internal combustion. This is a field in which I have some expertise and where I have personally experienced suppression of several different kinds. I have given a few of the details in my newsletters: http://www.eagle-research.com/newsletter/newsletter.html.

The electrical power grid, radio, robotics, and the basis of much of the medical diagnostic was invented and implemented by Nikola Tesla around the beginning of last century.

I can prove beyond a reasonable doubt that 'Vested Interest' does suppress technology that would cause their 'investments' to produce less income. Depending on the particular technology, such as fossil-fuel consumption, vested interest could even be governments.

I have personally attended a meeting between industry and a trade school where the topic was what and how to train the students. I can verify that industry as 'vested interest' wants the students to ONLY fix what exists. They are taught what to think, not how to think. These meetings take place on a regular basis because schools need the 'donations' from industry and they want their students to be 'employable'.

I'm sorry to say that my experience is that this 'what to think' effect is spread throughout the education system, including professions such as 'physicist'. Some are open-minded enough to actually look at hair-brained 'alternative energy' ideas and try to educate when they see an idea that won't work. Most of those that discover an idea that will work simply disappear. I haunt old bookstores because I find them gold mines of information that has been eliminated from current teaching.

I have never had a legitimate customer complaint, yet my business has been investigated several times by various U.S. Government and 'public protection' agencies, because I sell 'fuel-saving' technology. I have had my own telephone company tell me that my telephone was tapped. I have had the post office 'lose' over $50,000 worth of customer orders. These harassments are only a few of the barrage of suppression techniques that I live with everyday.

I could go on and on, easily getting labeled as a "conspiracy addict". Since I am an inventor in these technologies and have felt the suppression in many ways, I believe I have the right, and perhaps obligation, to tell people who live in comfortable niches that the suppression they are not directly feeling, is in fact affecting their lives.

We all could be living very much higher standards of living if only technologies that already exist were not suppressed. In the course of my 'alternative energy' research, I recently developed a 'spin-off' technique, using technology invented in the 1800's, to inherently eliminate the 'phantom load' and 'inductive losses' experienced by most transformer applications. In a lot of cases, particularly in small appliances, this would cut power consumption by over 50%. This single technique would save billions of watts. I can't even imagine how much power it would have saved if it had been implemented from the beginning of using AC electricity.

Anyone who thinks that suppression doesn't exist has simply not looked at the facts. For example; spending only a day in the patent office, I found that in the last 25 years there have been over 3500 fuel saver patents – not one of which is on the market. This is not because fuel savers don't work, because I prove everyday that there are fuel savers that do work. It is because the suppression mechanism is in place and 'self-propagated' by people who have no idea that they are part of the process. They are only propagating what they were taught to believe.

I don't dwell on it, but suppression is very much a reality in my life. It is why I structure my business as I do. I am a self-employed inventor and have been since 1984. I do not patent. I distribute full facts on my developments directly to the public. I do not sell 'devices' that trigger the major suppression responses.

That's my 2 cents. I felt obligated to say it. It may not be fair, but I will not respond to discussion on this subject; it's already taken two hours of my time to compose this email.

Thanks for reading.

George Wiseman
President, CEO of Eagle-Research
http://www.eagle-research.com

Tom Ogle: 100+ MPG Oglemobile

Tom Ogle's Oglemobile ran on fumes extracted from a heated tank in the trunk without a carburetor (see US patent 4,177,779). The media witnessed a test of a 4,600-pound 1970 Ford Galaxie which was driven 200 miles on less than two gallons of gasoline. Ogle predicted that an economy four-cylinder engine would achieve 260 to 360 miles per gallon.

A Shell Oil Co. representative asked Ogle what he would do if someone offered him $25 million for the system. Ogle responded "I would not be interested". He later said, "I've always wanted to be rich, and I suspect I will be when this system gets into distribution. But I'm not going to have my system bought up and put on the shelf…"

The August 1977 issue of Argosy magazine which carried a five-page article on the Oglemobile has disappeared from many libraries and even the Library of Congress. Argosy even ceased publication shortly after the article published. The El Paso NBC TV station that had filmed the test run "lost" the footage.

Tom Ogle died in 1979. Two others connected to Ogle died mysteriously. One was mugged while jogging with no cash. The other died while working for the military at a shooting range.

Charles N. Pogue: 200+ MPG Carburetor

In Jan. 3, 1935 Charles N. Pogue was issued a Canadian patent – 353,538 – for a High Mileage Carburetor.

In Apr. 9, 1935 Charles N. Pogue was issued a US patent – 1,997,497 – for a High Mileage Carburetor.

In Jan. 7, 1936 Charles N. Pogue was issued a US Patent – 2,026,798 – for his newer High Mileage Carburetor. Pogue used the carburetor for about ten years on his car and produced about 200 carburetors thru the Economy Carburetor Co. (Copies of the following three test reports plus a drawing of the Pogue carburetor can be viewed at http://www.byronwine.com/files/1936%20Ford%20test.pdf.)

In early 1936 T.G. Green, President of Breen Motor Company, Winnipeg, Manitoba, Canada tested the Pogue carburetor on a Ford V-8 Coupe and got 26.2 miles on one pint of gasoline. The performance of the car was 100% in every way. Under 10 mph the operation was much smoother than a standard carburetor.

In April 30, 1936 Ford Motor Company, Winnipeg, Manitoba, Canada tested the Pogue carburetor and was at "a loss to understand" how the carburetor got "25.7 miles on one pint of gasoline"! (That's approximately 205 mpg). Mr. W.J. Holmes and Mr. Purdy conducted the test for Ford Motor Company.

In Aug. 10, 1936 S. Stockhammer tested the Pogue carburetor on a 1934 Ford V-8 Coupe and got 28 miles per pint of gas. "I can say the performance was all anyone could desire in every shape of form."
In Dec. 12, 1936 Canadian Automotive Magazine states that the standard carburetor gets about 25 mpg at only 9% efficiency. Therefore the Pogue carburetor is 72% efficient overall at 200 mpg.

Pogue had his shop broken into and carburetors stolen.

In 1953 CARS magazine stated that in the opening months of 1936, Pogue panicked the Toronto stock exchange and threw fright into the major oil companies. Stock exchange offices and brokers were swamped with orders to dump all oil stock immediately. This same article states that Winnipeg's largest automobile dealers tested the Pogue carburetor and got results of up to 216.8 mpg!

In 1945, according to an unnamed source, carburetors marked "POGUE CARBURETOR, DO NOT OPEN" were used on American Army tanks throughout WWII but were removed from circulation after the war ended.

In 1980 Arthur C. Sgrignoli, after 45 years, has built a legendary Pogue carburetor by hand and is said to have achieved an efficiency of 86%. Contact was made through his brother, William J. Sgrignoli.

In 1981 Ultra-Lean Carburetors of Northridge, CA, was selling a set of plans for the Pogue carburetor for $50.

As of January 1981, Charles N. Pogue was still alive at age 81 and was living in a rest home in Winnipeg, Canada. He refused to talk to anyone or to receive visitors from outside his own family.

On the other hand, according to http://www.snopes.com/autos/business/carburetor.asp, the Pogue carburetor is an "urban legend". Perhaps some university mechanical engineering students can be funded to replicate the Pogue carburetor as a laboratory exercise and then measure its performance.

An email correspondent of Gary Vesperman wrote June 11, 2006 that, before he got involved with an electronic mileage booster two years ago, he checked the Internet and both Consumers Union and the Department of Energy lambasted all previous fuel optimizers. DOE listed about 75 of them they tested and which did not really work.

(Of course they say that… I think the Pogue carburetor was the one that worked until lead was added to gasoline, and it was this additive that clogged up the device and prevented the mileage gain. Bruce McBurney, source. McBurney's site http://www.himacresearch.com/ has more on carburetors.)

The addition of lead to gasoline resulted in widespread permanent environmental pollution of millions of pounds of poisonous, brain deadening lead. In 1967 at the University of Wisconsin-Madison this writer, Gary Vesperman, took an introductory course in meteorology.

One lesson Professor Reid Bryson gave was based on a study he had conducted of the extent of lead poisoning. I used his research results as the basis of a "letter to the editor" which was published in *Business Week* magazine in 1970.

I am not sure if I have the dimensions correct, but the numbers went like this: Residents of northern Wisconsin were found to have 0.1 micrograms of lead per cubic centimeters (cc) of their blood. Residents of the northern suburbs of Chicago had 1 microgram of lead per cc of blood. Residents of downtown Chicago had 4 micrograms of lead per cc of blood. The fatal level of lead poisoning apparently is approximately 6 micrograms of lead per cc of blood.

So in the *Business Week* letter to the editor I postulated that in another decade or so, rising levels of lead in blood would result in greatly increased mortality rates among downtown Chicago people since they evidently were already two-thirds dead.

Weeks later, by coincidence (?), there was intense national publicity focused on lead poisoning which resulted in Congress passing a law mandating a phase-out of lead in gasoline. Some people claim there is a so-called "law of unintended consequences". The platinum dust hazard from catalytic converters is another awful example of this "law". Maybe it is time for me to once again try to rouse the rabble?

Professor Bryson was an expert climatologist. He explained to our class the basics of global warming due to the atmospheric increase in carbon dioxide – as also explained by Al Gore in his movie An Inconvenient Truth. Bryson also explained the basics of global cooling due to increased dust plus sunlight reflecting off the ice crystals from jet engine exhaust which float high in the atmosphere for up to six hours.

I remember cornering Bryson after one of his lectures and asking him which was going to "win" – global warming, or global cooling? With an unforgettable grim look on his face, would you believe he said global cooling?!!

39 years later with vastly more data, global warming dominates the scientific consensus. Most worrisome, in 2006 climatologists found a preponderance of positive global warming feedback loops compared with pitifully few negative global warming feedback loops. (Source: "Our worst fears are exceeded by reality" http://news.independent.co.uk/environment/article2110651.ece) Global warming seems to be speeding up!

Yet ExxonMobil tries to bias global warming research towards the possibly dishonest conclusion that global warming isn't really happening. For example "Is the Sky Really Falling? A Review of Recent Global Warming Scare Stories", is a Cato Institute research study published August 23, 2006 by Patrick J. Michaels in http://www.cato.org/pubs/pas/pa576.pdf. http://www.cato.org/current/global-warming/ has an entertaining list of sarcastic titles of papers on global warming by Michaels. Is Michaels being paid to be a disinformation hack for ExxonMobil rather than as an honest weather scientist?

The Cato Institute received $55,000 from ExxonMobil in 2002-2003. The George C. Marshall Institute received $185,000 from ExxonMobil for "Climate Change Public Information and Policy Research" in 2002-2003. The Tech Central Station Science Foundation received $95,000 from ExxonMobil for "Climate Change Support" in 2003. Michaels is also employed by the George C. Marshall Institute and the Tech Central Station Science Foundation. (Source: http://www.environmentaldefense.org/article.cfm?contentid=3804&CFID=21084385&CFTOKEN=29888831.) Incidentally, Michaels earned his Ph.D. in ecological climatology from University of Wisconsin-Madison in 1979.

The Union of Concerned Scientists lays the blame for at least some of the ongoing uncertainty squarely on the shoulders of the world's largest publicly traded company – ExxonMobil. The scientific group has documented that the oil company has "funneled nearly $16 million between 1998 and 2005 to a network of 43 advocacy organizations that seek to confuse the public on global warming science".

Many of the organizations have overlapping staffs, board members and scientific advisers, according to the report, leaving the public with the impression that agreement on the certainty of global warming is far from universal. Funding by ExxonMobil allows these affiliated organizations to "publish and republish the works of a small group of climate-change contrarians," the report states.

ExxonMobil has a lot at stake. A shift toward cleaner forms of energy could greatly diminish its revenue, which reached $339 billion in 2005. (Sources: January 6, 2007 Las Vegas Sun editorial and http://www.ucsusa.org/assets/documents/global_warming/exxon_report.pdf.)

Allen Caggiano: 100+ MPG Fuel Implosion Vaporization System

INVENTOR'S HARDSHIPS --- SUPPRESSION OR COINCIDENCE? YOU DECIDE!
IS US. PATENT # 5,782,225 BEING SUPPRESSED ....OR... ARE THE "HARDSHIPS" THAT THE INVENTOR SUFFERED JUST "A COINCIDENCE".??????." YOU DECIDE !

In the early 1970, in Brockton, Ma, I owned and operated a company called Debal Heating and Air Conditioning. This was about the time that we had that phony gasoline shortage. Each morning myself and 12 employees would sit in the gas line with 6 trucks to get a mere 5 gallons of gasoline. As I sat in that gasoline line day after day, I started to think there must be a better way. If they have the technology to put a man on the moon they must have the technology to get much better gas mileage.

It wasn't long before I built my first fuel vaporization system. I read everything that I could get my hands on about this. Well sad to say it didn't work. It made plenty of vapors, and exploded like a BOMB. Over 70% of my body received 3rd degree burns. I spent 69 days in intensive care, kissing death several times. Don't worry, all the bugs are worked out now.

October 15, 1983 was the birth of my Fuel Implosion Vaporization System. At this time I owned and operated a company in Brockton Ma, called Weatherall Energy Research and Development. I had just finished building a commercial high-efficiency air conditioning evaporation coil when I poured one gallon of gasoline into one end to flush it out. To my surprise massive fumes discharged from the other end, and all I got back was less than one cup of gasoline.

I started brainstorming, I miniaturized the air conditioning evaporator coil, installed it in 1973 Dodge station wagon with a 318 engine. By early 1986 we had worked out all the shortcomings and bugs and had a working prototype that gave between 111 to 113 mpg. We placed an ad in the Brockton Enterprise and the Boston Globe, seeking people to beta test our Fuel Implosion System.

It wasn't long before I got a call from a California corporation wanting exclusive rights to our invention. My attorney checked them out. They were a subsidiary of several other corporations and finally all owned by an oil company. I declined their offer. Shortly thereafter all my troubles started.

First came two men, showing IDs, saying that they were from the FBI and that I was violating federal laws altering carburetion systems and that if convicted could get 20 years in a federal prison. I called my attorney and told him what happened. My attorney informed me that I wasn't in any violation of any federal laws.

If I was smart I should have stopped here. (BUT I AM NOT TOO SMART). For the next two weeks I would receive every day in the mail, in a plain envelope, 8"x10" close-up photos of my wife in the supermarket, church, and my children getting on and off the school bus and in the playground at school.

(Just pictures only.) In addition we would get all kinds of weird calls mostly after 2 a.m. My wife couldn't take it anymore; she filed for divorce and left me.

A few days later my attorney showed up at my office, looking white as a ghost. He had all my legal files and records with him, placed them on my desk and said that he could no longer represent me in any legal matters. I asked why. All he would say is: "WAKE UP!". I could not understand. He had been my personal friend and attorney for over 16 years.

When my wife divorced me and my attorney abandoned me, I wondered what else could happen. Nothing, I thought, nobody can stop me now, so on with my fuel implosion system. Boy was I wrong: hell opened up and swallowed me alive.

I am a very light drinker; if I drink 6 cans of beer a year, that was a lot. I never did drugs or was around anybody that did. On July 4, 1986 the chief of the Brockton Police, Richard Sprawls, with a bunch of other Brockton police raided my Tremont St. Brockton home, and arrested me for trafficking of cocaine. My bail was set at $500,000.

I was lucky that I had a friend, LT. Jim Sullivan of the Brockton Police Department. He showed up at my bail hearing and said something to the judge, and my bail was reduced to $500.00. Is somebody trying to tell me something?

Oh well, back to work; I built two more fuel implosion systems. I installed them in a 1973 Olds Cutlass and 1966 Mustang. I painted my 1973 Dodge station wagon bright yellow, with big red letters all over it saying: "THIS CAR GETS OVER 100 MPG AND DOESN'T POLLUTE THE AIR .THE BIG BOYS ARE TRYING TO MAKE ME AND THIS CAR DISAPPEAR,--HELP ME! " I only got to drive my yellow wagon for 3 days.

On November 24,1986 Brockton chief of police, Richard Sprawls, and other members of the Brockton Police Department raided my Tremont St. Brockton home. They seized two shotguns, a 12-gauge and a 20-gauge, both of which were legally registered to me. I used to use them for skeet shooting.

I was arrested and charged with for trafficking of cocaine again. My bail was revoked. I was placed in maximum security in the Plymouth House of Correction. I was now sentenced to 15 years for the July 1986 trafficking of cocaine and waiting for the second trial for the November case.

I knew where I could get some solid evidence that would clear me, but I didn't know who to trust ANYMORE. So, I escaped from maximum security, went and got my solid evidence and gave it to the right person and surrendered the same day.

Boy I was lucky, they had over 240 law enforcement offers searching for me with guns, dogs, helicopters etc. I ran like a jackrabbit through the woods. My advantage was, the woods were my old hunting grounds.

Two days later Brockton's chief of police was arrested for STEALING COCAINE FROM THE POLICE EVIDENCE LOCKER. HE WAS SENTENCED TO TWO YEARS IN PRISON. REMEMBER THE COCAINE THAT CHIEF RICHARD SPRAWLS SAID HE FOUND AT MY HOME IN JULY AND NOVEMBER 1986? NOW I KNOW WHERE IT CAME FROM, THE POLICE EVIDENCE LOCKER, AND IT FELL OUT OF CHIEF SPRAWL'S POCKET ONTO THE FLOOR IN MY HOME WHERE ANOTHER BROCKTON POLICE OFFICER FOUND IT.

Well, the Massachusetts Supreme Court of Appeals overturned my cocaine trafficking conviction. Grounds: tainted evidence, illegal search and seizure.

FREEDOM AND HOME, HERE I COME! WRONG AGAIN! HERE COMES THE FEDS. THEY HAD A WARRANT FOR MY ARREST FOR VIOLATING A NEW GUN LAW THAT WAS PASSED ON NOVEMBER 24,1986. THAT WAS JUST 10 DAYS AFTER MY ARREST OF November 14,1986. Remember the Brockton police seized my two shotguns?

Guess what? I had the privilege of being the first person in Massachusetts and the third person in the United States to be tried, prosecuted and sentenced under this new law 18 USC 922g and 924e. I didn't stand a chance; there was no case law in the law books to support my defense of this new law.
I was sentenced to two 5 years' sentences for perjury, because when I bought the two shotguns there was a box that said: were you ever convicted of a felony. I checked the no box, because I was never convicted of a felony, just a misdemeanor.

Well, the feds said under federal law my misdemeanor was a felony, therefore, I was guilty of 2 counts of perjury and they gave me 5 years on each count.

Next I got 5 years for being a convicted felon in possession of a firearm. Now I have been sentenced to a total of 15 years in federal prison without parole. I am still sitting in the courtroom. After a week of trial, my attorney said that the US Attorney was trying me under the second part of the new law. My attorney said the trial will be short, won't last more that ten minutes. There was no way I could be found not guilty.

Well, it went like this:

1: I was convicted as a felon in possession of a firearm.
2: I was convicted of perjury.
3: I was convicted of a second count of perjury.

BINGO! I HIT THE JACK POT!!

USC 18922g-e1 states: If you have 3 prior felony convictions and have possession of a fire arm, then you are an ARMED Career Criminal and that carries a minimum mandatory sentence of 15 years without parole. Now I have a total of 30 years in federal prison without parole. Well, the Feds have me tucked away for 30 years where I cannot cause any more trouble with my fuel implosion system. WRONG, WRONG, WRONG:

I met a lot of powerful people in the federal prison, with powerful connections on the outside, among them, Kenny whose son was a patent attorney for a large patent law firm who did our US patent. #5,782,225, while I sat in the safety of the federal prison system.

Remember the Feds sentenced me to 30 years without parole??? Well, on September 13, 1997 (Friday the 13th, my lucky day) I was released from federal prison with 5 years parole.
STOP! Something's wrong here. I only did 10 years of a 30-year sentence, with no chance of parole. Well it took the federal courts to rule that it was legal for me to possess the two shotguns, that they had no jurisdiction. The case is now pending in the 1st District Court. They will not rule on it.

This September 2001 will be 4 years that I have been out of federal prison and have been a good boy, nice and quiet, until now.

My Intentions: In the past 20 years I found out that the oil companies will do EVERYTHING in their power to suppress this kind of technology, because it could reduce the gasoline consumption in the U.S. by 76% over a 5-year term.

The government will lose mega bucks in gasoline taxes.

The major car manufacturers will lose billions spent on the technology of the fuel injection systems, my technology makes theirs obsolete.

I put all my patent and shop drawings up on this website, for anybody to use it free. I am 58 1/2 years young now; the sand is running out of my hour glass fast. I don't want to take this technology to my grave with me. If you think that I should get something out of this, then build my fuel implosion system, and after your 5th tank of gas send me the price of a tank of gas; otherwise I don't want a cent.

If you believe that me and my patent and technology have been suppressed, then tell as many people as you can about my story and ask them to do the same.

The Reason I Ask This Is: I believe that millions of people around the globe want this kind of technology and know it exists. When we get enough people wanting this technology, I have powerful attorneys, who know and are able to present it to the courts of the globe.

I will take my remaining 7 cars, that have my fuel implosion system in them, out of exile and drive them from Boston to California with the whole world watching, and I think my chances of reaching California alive are excellent.

By my publishing this website, I must be out of my mind. What else could happen to me? MAYBE I will get killed or something. What will be will be.

Thank you for your interest. Please help me spread the word. And for those of you that think that my story is just a bunch of bad luck for an unlucky inventor, you will be of those who oppose this type of technology. So go to my home page and VOTE NO for this technology.

Sincerely,
Allen Caggiano, Inventor
http://www.get113to138mpg.com/

P.S.: As much as I would like you to build my Fuel Implosion Vaporization System and succeed, I MUST URGE you NOT to build it without QUALIFIED and PROFESSIONAL help, if you are not a qualified machinist or mechanic yourself. This is NOT a simple D.I.Y project and working with (vaporized) fuel is dangerous!

(The electric auto magazine Electrifying Times (www.electrifyingtimes.com) has published a much longer article on Caggiano and his FIVS in its spring-summer 2006 issue Vol. 10 No. 1. By the way, that particular issue happens to focus on suppressed energy inventions.)

(The following is a subsequent report on Caggiano's on-going suppression troubles.

I just want to inform you as to Allen Caggiano situation. He had the web site www.get113to138mpg.com. He recently was trying to bring out a product. He had a few problems and then disappeared. From what I have been told Allen had been in a hospital recuperating from surgery. He went in to have a CAT scan and woke up a month later without the use of his legs. He said he died twice but came back. He was in a coma most of the month. While recuperating and watching TV one afternoon he saw a SWAT team raiding his apartment seizing his computers, notes, tools and car. The postal service is also investigating because he failed to deliver products. He said there were pressure crack problems. He could not ship and thought things would be redone in time. But just too many things went against him. Even though things look bad for him I still believe he is trying to get this out doing the best he can. I and some others have checked out his stories and had them confirmed. He does have a valid patent for fivs 2 ad. He was framed in his first arrest, and the police chief was dirty. If he were a con artist smart enough to pull this off, he certainly would not be around trying to do what he is doing still. He would be in another country spending the money with another name and ID. For that matter who would use their family name with so many ties and some of the different weird stories have been independently confirmed. His web site is down and I wonder what will come of him. Best way to suppress something is to make it look like a con game. It seems the oil companies are good at that. HIMAC has always tried to help anyone in bringing out this technology. At present we are publishing the work of Tony O'Donnell. He has tripled his fuel mileage, obtained an Australian patent and some foreign patents, but could not afford North American patents and the time ran out. We put out his information research and AutoCAD drawings in a CD format – over 500 pages $39.95 money back if not satisfied. Allen is not the first to get hassled over this. We can only hope he is the last and this information finally surfaces to completion. I only know Allen from phone conversations and the feed back from those who know me. I have not witnessed a verifiable mileage run from him. When I know more it will be posted. (Source: http://www.himacresearch.com/links.html.)

(Erik Masen provides an update in his "Suppression of Quantum Leap Inventors" *Electrifying Times*, 2007, Vol. 10, No. 2)

Recently in our last issue we did a feature story on Allen Caggiano "High Mileage Dreams". Allen had spent a good share of his life developing and selling versions of his high-mileage fuel devices. This feature story covered his many near death experiences by groups who did not want to see his technology go mainstream. Recently some U.S. Government representatives invested in Allen's company in an attempt to shut him down for good. Allen fled to China where he is having his high mileage devices manufactured. Few have heard from him since!

William Bolon: Automobile Steam Engine

William Bolon, Rialto, California, developed an unusual steam engine design in 1971 that was said to get up to 50 miles to the gallon. The engine used only 17 moving parts and weighed less than 50 pounds. It eliminated the usual transmission and drive train in an automobile. After much publicity, the inventor's factory was fire bombed with damages totaling $600,000. Letters to the White House were ignored so the inventor finally gave up and let Indonesian interests have the design.

Shell Oil Company: Achieves 376.59 MPG with a Modified 1959 Opel in 1973

Shell Oil Company wrote "Fuel Economy of the Gasoline Engine" (ISBN 0-470-99132-1); it was published by John Wiley & Sons, New York, in 1977. On page 42 Shell Oil quotes the President of General Motors who in 1929 predicted 80 MPG by 1939. Between pages 221 (see http://www.byronwine.com/files/Shell%20P221.pdf) and 223 (see http://www.byronwine.com/files/Shell%20P222.pdf) Shell writes of their achievements: 49.73 MPG around 1939; 149.95 MPG with a 1947 Studebaker in 1949; 244.35 MPG with a 1959 Fiat 600 in 1968; 376.59 MPG with a modified 1959 Opel in 1973 (photos of these three cars are shown on page 223).

The Library of Congress, in September 1990, did not have a copy of this book. It was missing from their files, of course. [They had it – since it is legally required to have at least one copy of all such publications in the U.S. However, it seems to have been stolen or hidden.] Byron Wine bought a copy from Maryland Book Exchange around 1980 after a professor informed him that it was used as an engineering text at the University of West Virginia.

The modified 376.59 MPG 1959 Opel is now owned by an Alabama antique car restoration company (see http://www.race-cardrivers.com/shop.htm).

Honda: 60 MPG 1992-1994 Honda Civic VX

The U.S. Government, pressured by major US oil and automobile companies, eventually denied import of the 60 MPG 1992-1994 Honda Civic VX. V stands for variable valve timing which can greatly increase a motor's efficiency. (Erik Masen, "Suppression of Quantum Leap Inventors", *Electrifying Times*, 2007, Vol. 10, No. 2)

IPMS-Chernovitsky: Super Ceramics

The I.N. Frantsevich Institute for Problems of Materials Science (I.P.M.S.) is one of more than 70 institutes founded by the government of the Soviet Union during the decade following World War II. Its mission was very simple: the scientists forcibly relocated from post-war Europe and enslaved at the Institute were commissioned to learn everything there is to know about the material world. They were not asked, indeed, they were not permitted, to make any decisions about how their discoveries were to be applied. In fact, from the outset and during all of the ensuing 40 years, there was not a single applications engineer among the 6,600 scientists who worked in the Institute.

The peculiar set of circumstances which provided the essential breeding ground for the extraordinary discoveries spawned by the Institute was not reserved just to I.P.M.S. The central government of U.S.S.R. jealously guarded its absolute right to make all decisions about what was done with the discoveries created in all the institutes. It is not surprising, therefore, that a system of government so paranoid about anyone stealing a pair of shoes that it manufactured left boots in Moscow and right boots in Kiev, would totally fail to recognize or effectively apply the benefits of some startlingly new sciences to clothe, house and feed its own people.

In fact, it was precisely because the Institute was forced to operate in a purely theoretical environment, with no pressure whatever to meet production or marketing deadlines, operating virtually isolated from any contact with the outside world, that the scientists and academicians were able to produce at least 7 whole new sciences, 30 technologies, and 130 materials unknown in the West. It is largely because the most brilliant theoretical physicists in the entire Soviet Union were able to work for nearly 50 years in the singular pursuit of pure research that the sciences developed at I.P.M.S. are so fundamentally unique.

It is interesting to note that only a small part of the new sciences developed at the Institute was revealed to or known by the government of the former Soviet Union prior to its collapse in August, 1991. The antipathy of the Institute's scientists to the USSR government's shabby treatment led them to successfully hide nearly all of their often revolutionary research results.

One of the Institute's four sites, IPMS-Chernovitsky, developed moldable, machine-able, ultra-high temperature, super-hard, and strategic metal-alloyed ceramic substances.

The uniformity and density of ceramic materials is what determines the quality, consistency and persistence of the resonant tone produced by an oscillating crystalline material. Research has created a whole new family of moldable, machine-able, ultra-high temperature, super-hard and strategic metal-alloyed ceramics capable of withstanding operating temperatures of 1200 degrees centigrade. This is more than 400 degrees centigrade higher than can be tolerated by other known ceramic materials commercially available anywhere else in the world, including those manufactured by Allied Signal Corporation and Kyocera.

These materials are being utilized in entirely ceramic internal combustion engines, high-speed turbines and self-lubricating bearing surfaces. The latest ceramic materials designed for use in high-speed jet turbines operate continuously at temperatures in excess of 1200 degrees centigrade. This is more than 400 degrees centigrade higher than the theoretical limit allowed by the quantum mechanics model relied on in the West.

The ceramics produced at the IPMS-Chernovitsky plant have been made harder by fully one factor of hardness than the hardest alloyed metal machine tools currently produced by any other known means of manufacture. They have been made harder by at least one full order of magnitude than either natural or synthetically produced diamonds. Practical applications include drilling and mining, grinding tools, down-hole equipment, tool inserts and the new generation of cubic boron nitride tools that are currently in use.

Proof positive of the extraordinary uniformity and density of these materials is easily verified by a simple demonstration if the measurement of softening temperatures is deemed insufficient. Ceramic pistons manufactured for use in ceramic diesel engines will, when struck by a hard object, produce a clear resonant tone which persists for more than seventeen seconds. This is at least eight seconds longer than the resonant persistence produced by the finest glass or crystal ever manufactured.

Joint ventures of the IPMS with more than a dozen private sector companies to develop inventions have been repeatedly sabotaged by the U.S. Government's Defense Intelligence Agency and others. (Source: David G. Yurth, *The Anthropos Files: Tales of Quantum Physics from Another World – 2nd Edition*, 2007)

Stefan Marinov: Magnetic Vortex Hyper-Ionization Device

At his death Dr. Stefan Marinov was Assistant Professor of Physics at Sofia University, a member of the Physical Institute of the Bulgarian Academy of Science, and the editor of Deutsche Physik. One energy device he was developing was an over-unity magnetic motor.

http://www.spiritofmaat.com/archive/mar2/bearden.htm discloses the strange circumstances of Marinov's death.

(The excerpt below, with editing, is from Vencislav Bujic's report published January 14, 2002.)

Stefan Marinov was working on his magnetic vortex hyper-ionization device just one month before his sudden, unexpected death. There is high chance that his death was connected to the testing of this device, and that it was not a "suicide" as officially stated. Marinov was a good Christian and nobody expected him to commit suicide.

According to official news he presumably jumped off from the top of the four-level outside emergency staircase of the Bibliotheque in Graz, Austria. But nobody actually saw him jumping off. He was still alive, not even bleeding, when an ambulance and police arrived. Marinov died on the way to a hospital.

The police never notified anybody, including his son in Bulgaria. They sealed his apartment, not letting anybody inside, and also refused to release any letters found there, and refused to give any information.

Stefan Marinov was born in Bulgaria. When he got a passport, he moved to Washington. Secret agencies and their 'elite' bosses, who control sources of energy and are confusing people, wouldn't let Marinov alone when he went back to Europe, this time to Italy and Austria. These are the same people who prevented Tesla and many others from giving to all the people sources of free energy. His life was ended abruptly. He had big plans for the future and was making various future collaborations. Marinov had planned to attend the International Physics Conference in Koln, Germany, on 25th of August 1997. He even had made hotel reservations for the conference for him and his colleague Professor P.T. Pappas from Athens, Greece.

Bob Aldrich (Reporter): Vibrating Energy Source

Message 414 DATE/TIME: 05/24/93 01:47
From : BOB ALDRICH -- RECEIVED --
To : JERRY DECKER (SYSOP)
Subject: (R) Bearden's Latest
Folder : A, "Public Mail"

Hi Jerry,

By lamentations I mean lamenting on how difficult it's been to get free energy made available to the people at large. How many people have tried to make it possible over the years? Must have been thousands. Who has succeeded?

Say, did you ever hear of a device that farmers were using possibly fifty years ago that worked on vibration? Apparently some very simple device that when set to vibrating, would put out ample free energy. Chicken farmers and such were building them and using them to power the ranch.

Until some one or two farms mysteriously blew up or burned to the ground, after some warnings. This was in the Midwest to my recollection. The fellow who told me did mention specifics but it was several years ago. He was very hard to pin down as he was always onto the latest thing and didn't want to talk about things in the past much.

Later,
Bob

Dennis Lee: Freon-Based Low-Temperature Phase-Change Engine

Dennis Lee during the mid-1980's developed a freon-based low-temperature phase-change engine similar to Bob Stewart's heat engine. The father of the Boeing 747 and other highly qualified people helped Dennis perfect his engine. A small plant was established in Seattle to produce and sell a commercial home-scale electrical generator. A Seattle area power company (the same one which became infamous for its failed WHOOPS nuclear power plants) campaigned to shut down the plant.

Dennis Lee was forced to move his company to Southern California to start over. He was subsequently imprisoned on a false charge for two years. His book "The Alternative" documents the falsity of the charge. The main point being a two-year imprisonment on a charge using an obscure law *never* used against anyone else in the state for either fine or imprisonment and during which a million dollar bond was demanded by the judge, similar to bail charges issued against murders and violent criminals, not inventors or even petty thieves.

Robert Stewart: Stewart Cycle Heat Engine

Bob Stewart spent $3,000,000 (mostly from farmers) developing patents on his "Stewart Cycle" engines for transportation vehicles and large-scale water lifters for canals during the late 1970's. His efficient and pollution-free engines use ambient heat to expand a working fluid such as ammonia and move pistons through sealed cylinders. He claimed that his low-temperature phase-change engine is more efficient and powerful than Dennis Lee's version.

Twice he built a factory, first in Coeur d-Alene, Idaho, and then in Deming, New Mexico, to make available for sale such valuable and beneficial technology. Both times, the factories were raided and shut down by the U.S. Government's Securities and Exchange Commission.

Through the Las Vegas area grapevine, Stewart fortunately in time heard that a contract on his life was in effect and had to go into hiding for nearly a year.

Jim Powell (Reporter): Flywheel/Dual Hydraulic Cylinder

Date: Tue, 20 Jun 2006
Subject: Great Information!
To: garyvesperman@yahoo.com

Hi Gary,

A friend just forwarded your 25-page e-article entitled History of 'New Energy' Invention Suppression Cases, and I enjoyed the reading. Amazing stuff!

There was one machine (for lack of a better term) I saw back in the mid-seventies that has haunted the back of my mind ever since, and I looked for a mention of it in your article. The article hints you have much more information and files elsewhere. Thought I would share with you what I recollect in case you already know about the contraption I witnessed.

During the mid-seventies I was a long-haul trucker and met an older man at a truck stop in Tennessee. Over cups of coffee we were talking about motors and diesel and mechanical things in general when he mentioned a buddy of his had invented a "perpetual motion machine" that he thought was pretty interesting.

I asked where it was and could I see it. He said the guy didn't live too far from where we were sitting but I would never be able to get my rig up the mountain. He offered to give me a ride. He was right. This buddy lived back in the hills and in Tennessee that can mean a mouthful. Good thing his truck was four wheel drive.

When we got there, his buddy was rather evasive about the whole thing which really puzzled the guy that brought me up there. So he kept asking and pushing for a demo and finally the inventor told us the day before some guys had visited and took a part or two and told him to not fix it or they would be back. I got the feeling that if it had been just me there, he wouldn't have told me anything or showed me anything but because his friend was with me it was different.

He took us out back where there were odds and ends on a workbench, and he quickly gave me a brief explanation of how the parts fit together and how it worked. I am sorry for your sake that I haven't remembered any names of the individuals so if you want to toss my email it is OK. Here is how the description went:

Flywheels by their character tend to develop power once they are in motion and can generate more power while spinning than they consume to keep spinning. Sounds interesting but I am no physics wizard.

So he had rigged a big flywheel between two double-acting hydraulic cylinders with the appropriate switches triggered by the rams to keep the two cylinders reciprocating as long as there was a steady supply of hydraulic oil pressure. The hydraulic oil pressure came from what looked like a modest-sized power-steering pump which was driven by the flywheel.

The flywheel was kept in motion by the moving cylinders, and the cylinders in turn were kept in motion by the switches and the fluid pump. The fluid pump was kept in motion by the flywheel. The switches and support for the flywheel (bearings) was taken during the confiscation by his unpleasant “visitors”.

To start the whole thing in motion he had a small electric motor to help start spinning the flywheel. Once it got up to a certain RPM the electric motor was disengaged and shutdown.

They both told me how he had been using it for various power needs around the farm from pumping water to cutting wood for over a year. When someone told him he should seek a patent for his machine, he followed that advice. Instead of getting a patent, he got the visit the day before I arrived.

I didn't feel like they were pulling my leg but again I know nothing of physics, and I was in my early twenties. There was no appeal to partner, contribute money or support or anything that would have made me suspicious. Wish I could have seen it working because it has kept me wondering the past 30 years.

Perhaps you have heard of these things and can comment on whether it was bunk or not. You may even have the scientific knowledge to instantly recognize its possibility or improbability. Anyway, after reading your article I thought I would pass this along for what it is worth.

Best Regards,
Jim Powell

This writer, Gary Vesperman, does not know of any similar device in the unconventional science literature. Perhaps one of my genius scientist friends can figure out this energy invention. Gosh, do the energy invention suppression bullies even track down energy inventors in remote hillbilly country, take away or damage their machines, and threaten them with death?

Christopher Bird/Walter (Reporter): Energy Suppression – An Invisible Galaxy of Inventions

http://www.spiritofmaat.com/archive/feb2/bird.htm and
http://www.befreetech.com/energysuppression.htm both list 48 energy inventions – nearly all of which are suppressed or at least not being commercially made and sold.

IPMS: Micro-Channels and Filters

The I.N. Frantsevich Institute for Problems of Materials Science (IPMS) was established in Kiev, Ukraine in 1951. Between 1945 and 1955, the government of the Soviet Union created at least 72 self-contained, completely isolated scientific communities like the IPMS scattered all over the most desolate parts of the Soviet empire. Stalin systematically established more than 360 such enclaves as a matter of policy. He deliberately prevented the scientists and their families from co-mingling with the rest of Soviet society or corresponding with the West. This phenomenon of cultural isolation was typical of life in the U.S.S.R. after World War II.

Many of the key scientists who were forcibly expatriated by the Red Army under Stalin's orders and relocated to work in the Institute had been captured by the Soviet armies during the occupation and annexation of Eastern Europe at the end of World War II. Only a handful of them succeeded in escaping to the West. Those who tried to escape were almost always captured and executed. In some cases, their families were sent to languish and die in the Gulags.

Many of the original team of scientists sequestered in L'vov, the entrance to the Institute, had been contemporaries, co-workers and close personal friends with many of the most prominent physicists and other scientists who emigrated to the United States before, during and after World War II.

During World War II in Europe, and afterwards in Stalin's Soviet Union, the original Directors of the Institute experienced the horrors of developing technology for destructive military use. For more than 40 years, scientists at IPMS (and, no doubt, at some of the other Soviet institutes) elected to keep secret as many of their key discoveries as possible until a time when their genius could be constructively applied to solving the global materials, energy consumption and industrial manufacturing issues which are responsible for the current deplorable state of the environment.

Among the original group of scientists relocated to work in the Institute were some who were part of the German team which worked during World War II to develop fissionable nuclear materials, synthetic fuels and foods, and other technological advances for the Third Reich. Information regarding the advanced nature of some of the work they participated in has only recently been declassified and released to the public. Some of the formulas and technologies they developed were absolutely revolutionary and many have never been replicated in the post-war world.

Among recently declassified files is a set of documents which describes the development of infra-red, heat-seeking "smart bombs" which were so effective that a single bomb, dropped by a single Nazi bomber in a night attack in the North Atlantic in 1942, sank a British troop ship carrying more than 3,000 American troops. The bomb recognized and guided itself down the troop ship's smoke stack in much the same way similar devices were observed to function during Operation Desert Storm, nearly 50 years later. The technology which made this device functional was so far advanced beyond anything available to the Allies at the time that the War Department kept the story classified for more than 50 years.

Many of the materials, processes, technologies and applications produced by the Institute are so unique that in some cases there are literally no words in the languages of the Western industrialized nations to describe them.

IPMS has produced a family of micro-channel and filter materials with uniformly controllable orifices as small as .5 micron from combinations of carbon-fiber, basalt, ceramic and strategic metals – including stainless steel, scandium and chromium. These materials demonstrate a consistency of orifices fully a factor of ten times smaller and more consistent than the smallest ever manufactured in the U.S.

These materials have been used in applications for heat exchangers, catalysts and separation of gases on a molecular level. A notable application involves the use of such materials to separate virtually 100% pure CO_2 from hydrogen gas at the well-head from gas wells. Then 98% of the CO_2 can be pumped back into the well for re-pressurization, with the pumps then being operated directly on virtually pure hydrogen fuel.

The scientists, academicians and others at the Institute who developed revolutionary new models of quantum mechanics, quantum physics and the manufacturing processes and techniques which resulted in these materials, refused as a matter of conscience to allow much of what they had developed to pass into the hands of the KGB and the Soviet military.

Joint ventures of the IPMS with more than a dozen private sector companies to develop these useful inventions have been repeatedly sabotaged by the U.S. Government's Defense Intelligence Agency and others. (Source: David G. Yurth, *The Anthropos Files: Tales of Quantum Physics from Another World – 2nd Edition*, 2007)

Viktor Schauberger: Jet-Turbine

During the 1920's Viktor Schauberger designed a novel hydroelectric generator for which he received Austrian Patent No. 117,749 Jet-Turbine on May 10, 1930. It seems that Schauberger actually used a small turbine of this design in a stream of water near the forest wardens' building during those years, but no reliable records are available. An English-language version of his patent is available at http://www.rexresearch.com/schaub/schaub.htm#117749.

Schauberger's jet-turbine does not require the use of a dam. Instead, the water to power it is contained in a vertically oriented large-diameter cylinder, ten feet or more in height. Due to the force of gravity and the elastic modulus (fluid dynamics) of water, a very large amount of potential energy in the storage vessel is converted to kinetic energy as the water is released into the oscillator (impeller). A pump is used to pump the water exiting the turbine back to the storage vessel.

The jet-turbine was estimated to produce 9 times more power for a given water flow than with a conventionally designed water turbine. The design also did not force water through immense pressure and heat which destroy the structure of water.

The water-vortex (jet of water) is produced inside a ribbed copper-cone, by the conical-plus-ribbed shape and gravity, and the resulting water-jet is rolled into the copper-impeller, which turns the generator, producing energy in a silent, effective way. The conical impeller has two or more intertwining spiral grooves incorporated in its outer surface, into which the water emerging from the nozzle is entrained, in order to rotate the shaft of an electrical generator. This method does not require a great deal of water, like conventional water-dam methods, and is absolutely silent.

In practice, only a small fraction of the output energy is required to power the pump, thus making this device a true free energy system. Ideally, the storage vessel should be egg shaped, with the outlet to the oscillating valve possessing the configuration of a long hyperbolic parabola. This outlet configuration will induce a longitudinal vortical motion to the water prior to its flow through the oscillator, thus cooling and densifying the water. The return pipe from the turbine should enter the storage vessel tangentially, in order to assist in the formation of a vortical flow.

In 1986 a group of enthusiasts living around the township of Schladming, who were interested in the practical application of Viktor Schauberger's ideas and Walter Schauberger's mathematics, decided to replicate Schauberger's jet-turbine in order to produce their own electricity. The "Schladming Group" comprised of R. Harbacher, H. Zefferer, H. Schrempf, A. Schwab, T. Promberger, M. Dainhofer, V. Knaus, and H. Mayer.

On the property of one of their members living on the Birnberg, they had carefully constructed the combination of egg and hyperbolic cone, which was sourced from a nearby brook. Water from the stream was fed into the upper part of the egg tangentially, thereby providing the initial impulse for the creation of a vortex. The electricity generator to be attached to the jet-turbine was being specially manufactured. Austrian authorities then told the Schaldming Group to stop their work before experiments were completed, using the excuse that they did not want to see these devices popping up all over the countryside.

Successful or not, what this replication of Schauberger's jet-turbine does show is that small groups of people working together cooperatively can provide their own sources of cheap power and can do much to re-establish their independence from centralized power and control over their lives. The problem that confronts us all, alas, is that it is the centralized electricity authorities who write the rules which ensure as far as possible that no one can escape the power grid. The greater the number of people who are willing to challenge this central control over their independence, the more difficult it will become for those to continue holding such power over us. (Sources: http://peswiki.com/energy/Directory:Suppression and http://peswiki.com/index.php/OS:Jet-Turbine)

Canadian Scientist: Standalone Water-Based Electricity Generator

Jeane Manning authored *The Coming Energy Revolution* and also has co-authored *Suppressed Inventions & Other Discoveries* (an anthology put together by Jonathan Eisen). She has heard numerous stories of suppression during twenty-five years of investigating non-conventional energy inventions. Her website is http://www.changingpower.net. New Energy Congress member Leslie R. Pastor's review of Eisen's anthology: "The book is breathtaking in its openness regarding actual suppression of 'real-time' inventors and innovators."

One story she told Gary Vesperman is about a Canadian scientist. In October of 1999, Manning met him through a mutual friend. According to her notes, he had invented an energy device which was the size of a refrigerator when he ran his home on its electrical output. He wouldn't reveal how it worked, except that it involved sound frequencies, copper plates, water, a transformer and a battery and could be built the size of a Walkman. (Vesperman: This device appears to be similar to the super-efficient water electrolysis devices developed by Daniel Dingel, Ken Rasmussen, and Stanley Meyer (see above). Notice that it offers the desirable feature of being scaleable from very small to at least big enough to run a house off the power grid. It also functions as a standalone generator, not as a less desirable over-unity power converter.)

His mistake had been in being confrontational. He called officials at Ontario's hydro-electric utility and told them to take their meter off of his house. When they arrived and cut off his power, he went down into his basement. While the officials stood out in his yard, the lights inside his house went on again. He came outside and bragged, "I'll put you out of business in six months!" Soon he was visited by men wearing Royal Canadian Mounted Police uniforms who gave him warnings and a document. He later showed the document to his son, a lawyer, who reinforced the message – keep your mouth shut. He dismantled his inventions.

He told Manning that the Royal Canadian Mounted Police basically told him to forget about his invention for thirty years. Twenty-six of those years had passed. He said the police kept an eye on his activities throughout the years. For instance, they interrogated him after an innocent business meeting in California which had nothing to do with the invention.

This German-Canadian scientist joined the many inventors who took their energy secrets to the grave. He was elderly, and Manning believes he died from natural causes.

Brazil: Ethanol Produced from Sugar Cane

Ethanol, produced from fermenting starch-based corn or sugar, is increasingly being blended with gasoline. Prices for ethanol in the United States recently hit an all-time high at over $3 a gallon. To impede competition from ethanol, the oil companies have arranged for the United States to impose a 100% (currently $0.54 per gallon) tariff on ethanol imports, which keeps prices for the alternative fuel artificially high. Brazil, which recently became energy self-sufficient in 2006, is the world's largest producer of sugar-based ethanol and would benefit greatly from a tariff reduction in the United States. Apparently it is cheaper and more energy efficient to produce ethanol from sugar cane than corn. Naturally, Brazilian rainforest preservation advocates likely would argue for running engines on water instead or some other more environmentally benign energy source.

Eric Fry and Kevin Kerr reported July 17, 2007 in *Rude Awakening* (www.agorafinancial.com) that ethanol production now consumes one quarter of the entire American corn crop, boosting the prices of corn and numerous corn-based products such as pork. But ethanol production consumes about as much energy as it delivers...if not more. American corn-based ethanol production relies on large government subsidies as well as huge amounts of fertilizer and fuel. Ethanol also requires prodigious amounts of water from the rapidly shrinking Ogallala Aquifer.

To cash in on the new corn boom, many farmers are continuously planting corn instead of rotating corn with soybean plants. Rotation serves several ecological and agronomic purposes. It makes it more difficult for diseases, weeds and insect pests to persist. The right rotation also builds soil fertility. Soybeans are a natural partner to corn because they capture nitrogen from the atmosphere, leaving more in the soil for the next year's crop. By not using proper rotation practices, farmers will almost inevitably face the prospect of growing corn in nutrient-deficient clay as well as increasing the loss of biological diversity.

By the way, the tariff on imported oil is 0%. External versus internal cost accounting analysis, with its corollary – the thousand-year cost, indicates that it would be fairer and make more sense to encourage conservation and to raise money for protecting Middle East oil sources with a tariff on imported oil.

David Crockett Williams (Reporter): Non-Drug Industrial Hemp as Bio-Fuel

Non-drug industrial hemp is not hallucinogenic marijuana although both are varieties of the same species (Cannabis sativa). Hemp provides a surprising variety of products. More than any other plant on Earth, hemp holds the promise of a sustainable ecology and economy.

Hemp seed is the most complete single food source for human nutrition. Because one acre of hemp produces as much cellulose fiber pulp as 4.1 acres of trees, hemp is the perfect material to replace trees for pressed board, particle board and for concrete construction molds. Hemp made into paper is of higher quality and durability and also is less environmentally damaging to make than paper from wood pulp. For centuries hemp has been processed into high-quality fabrics, sails, ropes, diapers, etc.

Additionally, hemp grown for biomass could fuel a trillion-dollar per year energy industry, while improving air quality and distributing the wealth to rural areas and their surrounding communities, and away from centralized power monopolies. Remarkably, when considered on a planet-wide, climate-wide, soil-wide basis, hemp is at least four and possibly many more times richer in sustainable, renewable biomass/cellulose potential than its nearest rivals on the planet – cornstalks, sugarcane, kenaf trees, etc.

For a comprehensive reference read Robert A. Nelson's thoroughly researched *Hemp Husbandry*, available free online at www.rexresearch.com. The book that started the hemp revolution, "The Emperor Wears No Clothes", has sold more than 600,000 copies to date (to order see http://www.jackherer.com/hemporium.html). Also see http://votehemp.com and http://groups.yahoo.com/group/hemp-reform-act.

Hemp as a bio-fuel poses a possibly insurmountable competitive threat to the fossil fuel companies. Since the days of the American revolution, the U.S. Government proactively encouraged growing of hemp. In order to reverse the U.S. Government's policy and to suppress hemp production, certain large banks and fossil fuel companies eventually were able to fool and stampede the US Congress into legislating a national ban on marijuana (and hemp) in 1937.

The US is the only major industrial nation to prohibit the growing of non-drug industrial hemp.

In spite of increased production and utilization of hemp grown in other countries, and increasingly strident pleas by state legislatures, hemp-related businesses, etc to legalize non-drug industrial hemp, the Bush Administration through the US Food and Drug Administration, working on behalf of the energy cartels and their associated banks, still maintains with an iron grip a fraudulent suppression of hemp disguised as a "war on drugs".

Ironically, the U.S. Government's own Veterans Administration Medical Center in Pueblo, Colorado has conclusively demonstrated (http://brain.web-us.com/alcohol.htm) that a couple of weeks of painless alpha-theta brainwave tuning permanently stops all forms of chronic substance addiction including alcoholism.

David Crockett Williams has submitted June 26, 2006 the following analysis that suggests that discussion of the politics of non-drug industrial hemp suppression should be included as a subset of energy invention suppression politics discussion:

In addition to high-tech energy technologies and inventions that have been suppressed by various means against their developers, one of the most important suppression issues regards the hemp industry for production of bio-fuels to replace the need for fossil fuels.

The main reason why it is very important to include the suppression of the hemp bio-fuel industry in any comprehensive energy technologies suppression discussion is because learning the suppression history about hemp enables people to understand the nature and scope of the ability of industry and government collusion to suppress knowledge – just like the knowledge about the new energy technologies inventions has been suppressed since the time of Nikola Tesla over 100 years ago, by the same greedy industrial monopolists with the help of their bought and paid for politicians.

This is important because otherwise folks studying the data on new energy technologies always wonder how such important information could be kept from the public, "if it is real". The history of hemp suppression explains this with irrefutable historical information now neatly compiled and annotated by folks like Jack Herer and his friends. See http://www.jackherer.com and http://www.myspace.com/hempjack.

Hemp was outlawed in 1937 in a fraud on the US Congress that is still not widely known. After an intentional and racist twenty-year campaign of yellow journalism slandering the "marihuana" becoming popular with blacks in the US after its introduction in the South by Pancho Villa's army's excursions into the US, marijuana was outlawed without telling the Congress it was in fact the hemp plant, the cannabis extract of its flowers being a main ingredient in most all patent medicines for decades before and after the turn of the 20th century.

The American hemp fuel industry was pioneered by Henry Ford who was against the oil monopolies and favored bio-fuels for automobiles. He even grew hemp showing how this was a superior alternative.

But in the early part of the 20th century most of the new industrial monopolists were interconnected by the emerging corrupt banking industry, those who put maximizing profits above all considerations including cost to consumers.

When the cotton gin analog for processing hemp by machine was finally invented in about 1917, this threatened many industries then emerging including the new paper industry begun about 1900 with the discovery of the process using sulfuric acid to bond the lignin in cellulose to enable paper to be made out of trees.

Newspaper magnate William Randolph Hearst was so heavily leveraged into ownership of forests to produce paper for his newspapers that he would have been bankrupted by a strong hemp industry using the new hemp decordicator machine because it takes much less sulfuric acid to make paper from hemp cellulose, and hemp is renewable.

So Hearst orchestrated his yellow journalism for the banks and other emerging industries like the growing petroleum industry, chemicals industry, alcoholic beverage industry, the fiber industry, and the drug industry, perpetrating this fraud on the Congress by outlawing hemp as marijuana. Then began the systematic expunging of the truth about hemp from the historical record and from the educational system in the US, by using the spurious and fallacious "narcotics hysteria" fomented and ongoing since that time.

Before the publication of Jack Herer's book “The Emperor Wears No Clothes” in about 1990 very few people knew about hemp, this suppression campaign being so successful. Since then many people have learned the truth by reading his book and others including Herer’s first editor – Chris Conrad. See http://www.chrisconrad.com.

There has come to be a very strong network of activists by now who know the truth and are working at many well funded levels to correct this situation. They know that the energy industry uses of hemp are important but they do not know much about the new energy technologies or the documentation of their suppression.

So including hemp energy industry suppression in this compilation about suppressed energy technologies will link these two key issues, both of which are needing widespread implementation to address global climate change as per the testimony of experts such as Dr. Brian O'Leary, who has started numerous new energy groups, and Alden Bryant, the grandfather of the UN Climate Stabilization Treaty movement and Earth Regeneration Society. See http://www.brianoleary.com and http://www.earthregenerationsociety.org.

This will afford the already established hemp issue activists the information they need to better open the minds of the American public and to also champion the end to suppression of new energy inventions, because they are fighting against a "drug war" prejudice. By their knowing and showing how the energy inventions are also being suppressed, the public could be awakened to the fact and the nature and scope of this industry-government collusion in suppressing any information that threatens the status quo of contemporary industry.

This will help them overcome the "drug war" as the smokescreen for the prohibition of hemp for all of its uses including energy and to replace the need to cut down so many trees and to re-green the planet to ameliorate climate change.

For an article explaining more about this double-edged sword to cut this Gordian Knot of suppression, the new energy technologies inventions plus a global scale emergency Hemp for Victory campaign, and why both are needed to remedy Earth's current climate crisis, see http://www.angelfire.com/on/GEAR2000/gear.html.

David Crockett Williams, Global Emergency Alert Response 2000
http://www.angelfire.com/on/GEAR2000, http://www.myspace.com/davidcrockettwilliams

Williams recently emailed The Canadian's article "Over 4.5 Billion people could die from Global Warming-related causes by 2012" in http://www.agoracosmopolitan.com/home/Frontpage/2007/01/08/01291.html which explains that the global warming crisis is much more immediate and dire than commonly understood. Western Siberia's 400 billion tons of methane in permafrost hydrate is gradually melting, releasing methane into the atmosphere. The released methane will speed the melting even more, initiating the rapid onset of runaway catastrophic global warming. Methane is more than 20 times as strong a greenhouse gas as carbon dioxide. Even a couple of billion tons of methane being emitted into the atmosphere each year would be catastrophic. For comparison, the atmosphere currently contains only about 3.5 billion tons of methane. 2012 is only five years away! A study by several thousand experts "Global Warming: The Final Verdict" in http://www.truthout.org/docs_2006/012207L.shtml dispels any doubts of a looming global catastrophe.

Dean Warwick: Ampliflaire Efficient Wood-Burning Stove

Dean Warwick's patented Ampliflaire is a major break-through in heating technology and is the only heat exchange process capable of raising combustion cycle efficiency within fuel burning systems. Other systems of heat exchange by their very nature must lower combustion cycle efficiency.

Ampliflaire recovers the heat energy other systems lose. Wherever fuel is burned or heat energy is wasted, there is a unit to resolve the problem, and flue-pipe models, retro-fitted to conventional boilers, convert them into overall effective condensing systems with remarkable savings.

Ampliflaire open fires release the electrical energy in plants, absorbed from the sun during the growing cycle. Grown fuels are the most efficient converters of solar energy, and the burning of grown fuels in this way is the safe way to make available energy from a nuclear reaction.

As hydroxides (OH) of carbon (C), the potential energy in plants far outshines their current use. With the largest man-made forest in Europe, the United Kingdom Government already recognizes a commitment to grown fuel which can easily satisfy British needs. Examples are winter species grass for methane gas, bio-diesel, hydrogen from plants, liquids, and wood replenishing solids.

Ampliflaire reduces heating bills by approximately 90%, reduces pollution, increases property value, removes household dust, eradicates condensation, and efficiently circulates refreshed air.

The company's brochure features numerous practical cases of individual or commercial clients who are now enjoying the benefits of Ampliflaire. From small cottages to large hotels, from churches to business premises, the company has an efficient and effective system available.

Dean Warwick keeled over dead October 7, 2006 in the middle of a Unidentified Flying Object (UFO) conference presentation in Blackpool, UK. Mr. Warwick was an alternative energy pioneer, former U.S. Government officer and intelligence insider who had promised to make some momentous announcements. The circumstances suggest a Central Intelligence Agency (CIA) 'hit' using an Extremely Low Frequency (ELF) weapon. These ELF weapons can be set on a 'delta wave' and are able to shut a person's nervous system down.

Much of this technology has been perfected on the 4th level of the CIA underground Dulce facility in the New Mexico desert. The fourth level of this underground base deals with technological aspects of human aura research, dream manipulation, hypnosis, telepathy and advanced mind control. The ELF weapons 'suck' the life out the victim's body, and Warwick literally 'fell asleep' on his feet. The suspected assassin was followed out of the auditorium by a quick-thinking woman who then observed him laughing as he proudly reported his murderous deed on his cell phone. (Sources: http://www.ampliflaire.co.uk, http://www.thetruthseeker.co.uk/article.asp?id=5337, and http://www.thetruthseeker.co.uk/article.asp?ID=5290)

Idaho Inventor: Advanced Zero-Point Energy Device

During the FBI siege at Ruby Ridge, Idaho, where the FBI shot to death a mother and child during a standoff concerning alleged illegal firearms, an inventor happened to be living and working on an advanced zero-point energy device in northern Idaho.

As the story goes (told to Erik Masen by an investor who was on his way to visit "Inventor X," who had just made a breakthrough in free energy but also, like Howard Rory Johnson, had made the mistake of publicizing his breakthrough on a local TV station):

The day before the investor arrived, two U.S. Government agents broke into the home, thinking that both Inventor X and his wife were away. As it happened, however, X's wife was still home and very familiar with the use of her hefty handgun. She held the agents at bay inside the house, while debunking their story that they were cable TV repairmen checking out the lines.

Had it not been for the siege at Ruby Ridge that day, who knows what else might have happened there. (Excerpted with permission from Erik Masen's article SUPPRESSION FROM HIGHER UP Inventors Beware! The Deadly Campaign Against Free-energy Devices, *Electrifying Times*, Vol. 8 No. 3 and also in http://www.electrifyingtimes.com/erik_masen_suppression.html)

Grant Hudlow: Method of Converting Garbage and Tires to Gasoline, Etc

During the early days of the Reagan Administration, much lip service was given and some money was budgeted to develop alternative sources of energy. Pahrump, Nevada resident Grant Hudlow, a former rocket scientist, was funded to investigate converting garbage, biomass, and tires to gasoline, low-grade heat, fertilizer, and saleable chemicals. His method began to look so promising that the oil companies and their allies in the Reagan Administration got scared and arranged to cut off his research funds. (Source: Gary Vesperman)

Joseph Newman: Energy Machine

In the news some years ago was Joseph Newman's energy machine. While Reagan stalled on acid rain, and Hodel pushed offshore drilling, the U.S. Patent Office continued to block commercial development of this latest of many government-smothered free energy devices. Newman sued the Patent Office for refusing to grant his machine a patent, in violation of its own regulations and the advice of the expert they chose to examine the device. They also issued false statements to the press about the invention's workability.

Over thirty respected electrical engineers, physicists and technical experts have endorsed Newman's machine and signed affidavits confirming his claim of greater energy output than external energy input. Ten congressmen have introduced bills which would require Newman's patent be granted.

As the Newman battle heated up, President Reagan appointed Donald Quigg, a thirty-year Phillips Petroleum executive, to head the U.S. Patent and Trademark Office. The judge entrusted with the case, Thomas P. Jackson, has violated judicial procedure, ignored expert testimony and ordered Newman's prototype confiscated and destroyed. During Watergate, Jackson was the attorney for John Mitchell and the Committee to Re-elect the President's corrupt finance division.

Newman identified the gyroscopic properties of subatomic particles and built a unique arrangement of coils and magnets to draw energy directly from them, thus converting almost immeasurably small amounts of the machine's mass into energy. Theory and device are detailed in "The Energy Machine", $38.45 including postage, from Joseph Newman Publishing Co, Route 1, Box 52, Lucedale, Mississippi 39452; 601-947-7147. Free press releases and brief technical descriptions are also available; send SASE. (Newman's claims and theories do not seem to be universally accepted among mainstream physicists and engineers. Gary Vesperman)

Bill Jenkins (Reporter): Free Energy Machine

BILL JENKINS: Free Energy Machine. Live on Something's Happening. Audio cassette #A1008-90 $9.00.

Bill Jenkins hosted the ABC radio "Open Mind" program for 7 years, the most popular program in the country in its time slot. He dealt with "New Age" topics and was taken off the air. Here he discusses the program and his adventures since, including a near arrest on treason charges for preparing to market a free energy machine.

Volcheck: Engine Powered by Gas with Unusual Expansion Properties

In 1995, a man named Volcheck of Grand Coulee, Washington, made a trip across the United States and back in a car powered by a special gas he developed that had unusual expansion properties. He claimed to have obtained the formula from some unpublished notes of Leonardo Da Vinci.

Volcheck says the gas expands enormously at about 395 degrees Fahrenheit to 450 pounds pressure. In other words, from approximately 390 to 395 degrees Fahrenheit, the gas expands from a volume of one unit to a volume of 10,000 units. He used this gas in a modified Franklin aircraft engine which behaved more like a steam engine. He never refueled during the trip, consuming $10 worth of this special gas.

Soon after his return, some congressmen invited him back to Washington, DC, for a special hearing and congratulatory meeting. While he was gone, U.S. Government federal marshals or a S.W.A.T. team forced entry into his shop, confiscated or destroyed his record-setting car, plans, components, and special gas containers. They subsequently told him to forget any more projects like this.

Gianni A. Dotto: Anti-Aging and Anti-Gravity Thermionic Couple

DATE/TIME: 06/13/93 10:05
From : ROBERT BONNER
To : DAVID MCWHERTER
Subject: (R) UV radiation + us
Folder : A, "Public Mail"

"Dave, There was an Italian researcher (actually he had a Ph.D.) who did research on how magnetic fields affected the body. He made about 3 or 4 classifications of magnetic type energy fields. Two were bad; one had some health benefits but in the long run had detrimental effects. The last one was, of course, the one he speaks of as far as research goes. This person's name was Gianni A. Dotto, born in Venice. His main area of research was "Bio-physics". Anyways, he built something that resembled a thermionic couple. It also levitated too... I said his name "was"; he's dead – murdered some time back. His device worked really well as far as curing cancer goes. And he was killed for it. Run over, several times to ensure his demise. [Details about the Dotto Ring are available online at http://www.rexresearch.com]…

"His ideas on how our DNA is electrically controllable is fascinating. With this device you could theoretically live until you died of an "accident". Once you reach about 40 something, (well, let me put it differently...) Once your body reached 10 base pairs per turn (DNA lingo) you could use the device to SUSTAIN that state of being, anything less than that and you begin to deteriorate. i.e. grow old... Now, if, perhaps, you could find the right setting, maybe you could be 25 forever. But who in the world wants that?!?!

"There were "reverse aging" effects detected on his elderly patients. So this is where all that mess above comes from. It isn't claimed to just be theoretical; he (Dotto) witnessed it. Anyways, I have the document and have read it. Would be cool to build.

"The most expensive piece is the ring part; it is an alloy. But, it would cost about 13 grand to build, maybe less if you knew the right people. It might be worth it for immortality and a life free of cancer and AIDS and the common cold. --- Robert Bonner"

IPMS: Thermal Electric Cooling Devices

The I.N. Frantsevich Institute for Problems of Materials Science (IPMS) was established in Kiev, Ukraine in 1951. It operated in absolute secrecy and was totally unknown to the American intelligence community until just prior to the implosion of the Soviet Union in August of 1991. The mission of the Institute was to use whatever tools or means were necessary to know everything there is to know about materials. They had no production deadlines to contend with, and there was not a single applications engineer in the entire organization.

The 6600 scientists and technicians who worked in the Institute developed an entirely new model of nonlinear quantum mechanics to describe the forces which make the world we live in behave as it does. This new model suggests that the material world is substantially different from the world described by the models relied on in the West. Seven new sciences, twenty-seven new technologies, and one hundred thirty previously unknown materials developed in the Institute are based on the same revolutionary new model of quantum mechanics.

Research and development in the deposition and culture of layered crystal lattices has produced an entirely new class of materials, previously unknown to Western science. These are referred to in recently submitted patent application documents as "Thermal Electric Cooling Devices". Because of the nature and function of a specially designed combination of crystal layered "hosts" and their intercalated "guest" materials, these specially designed capacitors actually absorb energy when subjected to a flow of electrical current, producing a specific cooling effect on the material surfaces. All other known materials produce heat when subjected to the same conditions. Temperatures of 60 degrees Kelvin (-259 degrees Fahrenheit) have been produced under controlled, carefully documented laboratory conditions. This is cold enough to liquefy free-standing nitrogen gas from the atmosphere.

The potential applications for this technology are manifold, but perhaps the most important is the potential it provides to totally eliminate any need for the use of compressed fluorocarbons of all types in refrigeration. Parallel applications in the telecommunications, computer and electronics industries have also been demonstrated to be highly effective and cost efficient, particularly as they relate to the use of super-conductive materials.

Arrangements to commercialize these useful energy inventions by joint ventures of the IPMS and more than a dozen private sector companies have been repeatedly sabotaged by the U.S. Government's Defense Intelligence Agency and others. (Source: David G. Yurth, *The Anthropos Files: Tales of Quantum Physics from Another World – 2nd Edition*, 2007)

Bob Lantz: Lantz Water and Power System

From : "Jerry E. Smith" <jerryesmith@gbis.com>
To : "'Gary Vesperman'" <vman@skylink.net>, "'gear2000@lightspeed.net'" <gear2000@lightspeed.net>, "'halfox@qwest.net'" <halfox@qwest.net>, "'mruppert@copvcia.com'" <mruppert@copvcia.com>
Subject : RE: Lantz needs Reno attorney
Date : Sat, 9 Feb 2002 08:58:07 -0800

Hi, I'm not sure who I'm responding to, so I am sending this to all of you. The only lawyer I know in the area who might be interested in this case is Day Williams of Carson City. He is a civil rights and personal injury lawyer who has represented me in the past (also the late Jim Keith and Sirhan Sirhan!).

Day R. Williams
Attorney at Law
204 N. Minnesota St.
Carson City, NV 89703-4151
775/885-8398
daywillia@aol.com
www.daywilliams.com

I hope this is of some assistance.

Jerry E. Smith
Author, "HAARP: The Ultimate Weapon of the Conspiracy"
(Adventures Unlimited Press, 1998)
http://www.jerryesmith.com

-----Original Message-----
From: Gary Vesperman [SMTP:vman@skylink.net]
Sent: Saturday, February 09, 2002 8:06 AM
To: Jerry E. Smith
Subject: Lantz needs Reno attorney

Jerry, I don't know anything about this, and I am too busy to even read it.

Gary

From : "David Crockett Williams" <gear2000@lightspeed.net>
To : "Hal Fox" <halfox@qwest.net>, "Gary Vesperman" <vman@skylink.net>, "Michael C Ruppert" <mruppert@copvcia.com>
Subject : Urgently need referral to Reno area attorney for Lantz
Date : Fri, 8 Feb 2002 02:16:08 -0800

WWII vet framed by CIA agent to stop energy inventions?

Below is draft of press release I will finalize with Lantz on the phone this morning and send to media lists etc. Please let me know if you can refer an attorney in Reno area who I can phone today to help with Lantz court appearance Monday Feb.11 at which his date to surrender to jail will be set.

From: "David Crockett Williams" <gear2000@lightspeed.net>
Subject: WWII vet framed by CIA agent to stop energy inventions?
Date: Thursday, February 07, 2002 10:06 PM

Seventy-five year old retired chemist and engineer Bob Lantz of Reno, Nevada, fought for the United States as a Navy pilot in WWII, but Monday the U.S. Government is set to imprison him, to "die in prison" according to his "public defenders", in an apparent scheme to suppress his new-energy invention to replace nuclear and fossil fuel power. Perhaps paralleling the case of Horst Jeske, jailed for years in a bogus fraud conviction set up by wired funds transferred by Frederick van Boduncan years after Jeske introduced him to Lantz as a CIA agent, and the case of San Francisco investigative journalist George Williamson who identified Boduncan from his research as a CIA operative previously involved in smuggling drugs into the US via oil rigs in the Gulf.

George Williamson was later named in a lawsuit by Mohamed Al Fayed against the CIA and other government intelligence agencies regarding purported CIA documents Williamson offered to Al Fayed linking the agency with the death of Princess Diana.

Lantz reports Monday for a custody surrender hearing after his sentencing to 5 years imprisonment for a fraud in fact perpetrated without his knowledge by Norbert Vogler of Colorado who forged investment certificates with Lantz' signature notarized by his friend who later acknowledged that Lantz was not present when the forged signatures were notarized -- one of 237 lies that Lantz has documented by Federal prosecutors in his trial after the government put him into poverty by illegally confiscating over $250,000 from him after a raid in 1994.

Why would anyone want to put an old man in jail who is so scrupulously law abiding that he never even got a speeding ticket, someone who accepted the government secrecy order suppressing the Papp Air Engine and therefore cancelled his contract to make Papp's protoype, someone who even calmly accepted the multimillion dollar loss in business due to U.S. Government denial of his permit application to export his water purification Sonofloc System 77 to the government of Egypt for seawater desalination?

Could it be that powerful people within the U.S. government are implementing covert policies to keep new energy inventions suppressed that would threaten the fossil fuel and nuclear power industries? Copious evidence says yes, and that Lantz' troubles really started after he began making new-energy system prototypes for other inventors in 1977 culminating with his 1989 discovery of an "overunity" energy generation system which combines his System 77 with an ultracentrifuge so the overall device not only purifies any kind of water but also produces sufficient heat to produce megawatts of electricity without any fuel at all, perhaps by "tapping the zero-point energy" with a kind of device the US Department of Energy in 1998 called "the Holy Grail of energy research".

How else could it be possible for this bogus fraud case to even be prosecuted after expiration of statute of limitations, with falsified evidence and the apparent collusion of prosecutors who lied and and public defenders who refused to contest the lies and offer documentation of innocence? Why else would Boduncan have brought this "gold certificate scheme" to Lantz as a funding mechanism for his invention?

The Lantz Water and Power System was first tested in 1989. It can solve our global energy and water quality problems.

And what does he get for it? An unacceptable "deal" offered by prosecutors and pushed by two successive public defenders who each claimed he "would die in jail" unless he took the plea bargain acknowledging guilt and forfeiting his assets (over $100k of that confiscated was not even in his name), a "raw deal" which this War Veteran refuses to accept.

Are we to sit by and let this happen or will concerned citizens and media bring his story out so he can get the legal help he needs to get his bogus conviction reversed, his name cleared and his money back so he can pursue development of his New-Energy System?

There is a vault at the US Patent Office containing 5,000 patents ordered secret by the government, confiscated from the inventors who are threatened with 20 years in jail if they release the information as per "dual-use" secrecy law uncovered under Freedom of Information Act and reprinted on p.162 of Jeane Manning's book "*The Coming Energy Revolution*". Her book provides overviews of various energy inventions. Isn't it about time we did something to take this situation under public investigation and control, especially motivated by the current Enron fiasco exemplifying the "ethics" of the fossil fuel industry and government complicity in "rigging" the energy industry?

Can we help Bob Lantz become a hero of this coming energy revolution instead of its casualty? Certainly our surviving WWII veterans deserve better treatment from our country citizens that they love and fought and died for.

Dr. Timothy Trapp: 127 Energy Technologies

Dr. Timothy Trapp, Warren, Ohio, is President of the non-profit company World Improvement Technologies (WITS). A contact email for WITS is wits2011@yahoo.com. They also have another non-profit organization called World Improvement Through The Spirit (WITTS) ministry.

Dr. Trapp called Gary Vesperman June 24, July 1, and again on July 4, 2006 with accompanying emails to provide more details on the companies' activities and suppression history.

Currently employing 11 scientists, WITS has been active in producing, installing and servicing free energy systems worldwide for 19 years. Dr. Trapp and the two non-profits have developed over 127 energy technologies. Approximately 20 utilize cracking water into oxygen and hydrogen, approximately 14 are gravity motors, approximately 50 are radiant energy machines, and the remaining are miscellaneous energy, propulsion and pollution remediation devices.

127 energy technologies are currently commercially available, including large-scale over-unity power plants – 5 megawatts and up. Many of these power plants are under construction in foreign countries but not in the United States due to suppression by the U.S. Government. WITS also makes and sells a device for 30 dollars that can be added to any electrical system that has batteries which would drastically increase the efficiency of that system (e.g. cell phone, radio, electric car).

Dr. Trapp states that if governments were FOR this technology instead of against it, a home-power generator the size of a desktop computer could be built and sold for about the same cost as fuel powered generators or less.

When Dr. Trapp moved back from Alaska, upon arrival, the shipping container containing his tools, equipment, etc., had been emptied. In spring 2001, Trapp's lab in Arizona was raided. At the end of 2001 two WITS scientist assistants were (and currently still are) in Ohio prison on trumped up drug charges.

In the past 20 years the U.S. Government has destroyed over 14 WITTS laboratories. As recently as spring 2006 a WITTS laboratory burned to the ground. The contents of each laboratory contained millions of dollars worth of equipment and several costly free energy machines. Dr. Trapp's laboratories were raided, his equipment was smashed, and his people were beaten and arrested numerous times on false charges. False evidence was planted many times.

After beating up one of his WITTS salesmen, the salesman was then killed by driving the salesman's car off a cliff. Another WITTS employee was also murdered by U.S. Government and so-called law enforcement agents. There have been numerous attempts on the lives of Dr. Trapp as well as many of his associates.

Dr. Trapp wrote "This really should be a wake-up call to the people of America who believe we have religious freedom here. We don't, when it comes to anything that might help the little guy.

On the positive side, with energy prices constantly going up, there is more activity than ever in alternative energy. Power plants are going in many countries. And a few countries are seriously working to get off fossil fuels all together."

From : Jerry Decker <jdecker@keelynet.com>
To : Gary Vesperman <vman@skylink.net>
Subject : Re: Trapp energy suppression
Date : Sun, 23 Dec 2001

Hi Gary! His name is Tim Thrapp.... (Not entirely correct. His name is Dr. Timothy Trapp. Vesperman) he used to live in Alaska. He was the one who told me about Henry Ford working with John Keely to create an arrangement inside early Model Ts so that magnets placed in them would make them self-running....the story goes that Ford was threatened by the oil companies for graft (kickbacks) or something along those lines...so he did this magnet trick as insurance...no one has yet come back with any proof of the claim that SOME Model Ts had these slots in the bell housing where magnets could be placed to make it self-running...here is the file; http://www.keelynet.com/energy/ford.htm (Vesperman: This can not be entirely true. John Keely died in 1898.)

When Tim called me several years ago with that story, he said one of the cars had been found and the engine or a copy of it had been demonstrated, and the inventor killed on his drive home with the engine on a trailer...the engine was stolen... Tim also said he had some radical new power generator capable of 50 kilowatts but he gave no details about it..this was back in 1997....seeya!

Gary Vesperman wrote:

Dear friends, I have received a letter from an energy inventor the following new energy suppression incident: "Tim Trapp, from Ohio, was put in jail by the federal authorities in Arizona and by the state police in Ohio."

Without success I conducted some searches for Tim Trapp on keelynet.com and google.com.

Do any of you know of any authoritative reports on Mr. Trapp's energy suppression troubles?

Gary Vesperman
702-435-7947

Jerry W. Decker - http://www.keelynet.com

Richard Diggs: Liquid Electricity Engine

Richard Diggs, Custom Invention Agency, P.O. Box 11, Carthage, Missouri 64836; patent process on hold, though he has over two hundred others. Diggs developed at an inventors workshop (I.W. International) his "Liquid Electricity Engine" that he believed could power a large truck for 25,000 miles from a single portable unit of his electrical fuel. Liquid electricity violated a number of the well known physical laws that the inventor pointed out. The inventor was also aware of the profound impact the invention could have upon the world's economy – if it could be developed.

David G. Yurth (Reporter): Remediating Nuclear Waste Materials

From: David G. Yurth [mailto:davidyurth@comcast.net]
Sent: Saturday, April 15, 2006 5:27 PM
To: 'STetreault@stephensmedia.com'
Subject: Remediating Nuclear Waste Materials - UNLV

Dear Mr. Tetreault: After reading your article in the Las Vegas Review Journal entitled “Nuclear Project Draws Interest,” I thought it may be of interest to you to know that the DOE has played this game with university and privately funded laboratories for many years. Perhaps the most comprehensive review of this subject ever undertaken was prepared by Mr. Richard Shamp, President of Nuclear Remediation Technologies, headquartered in Hyattsville, Maryland (301) 559-5057.

Beginning in 1997, NRT and its chief scientist S-X Jin [once the highest ranked particle physicist in the People’s Republic of China, until he escaped to the US in 1994 while addressing the Institute of New Energy symposium in Salt Lake City, Utah] have been submitting critical laboratory documents to DOE, demonstrating the effectiveness of known technologies used to remediate radioactive emissions generated by nuclear fuel waste materials in both solid and liquid form.

After being finessed into providing all the definitive laboratory data to Dr. Frank Goldner of DOE’s nuclear remediation division, then-Secretary of DOE Spencer Abraham attempted to confiscate, classify and impound NRT’s technology while at the same time pretending to be considering providing grant money to support its continued development.

The fact that the technology in question had already been awarded six patents [K. Shoulders et al] was the only thing that prevented him from succeeding. Instead of providing grant funding, Dr. Goldner was instructed to put an end to NRT's pursuit of DOE funding for the development and deployment of its technologies. And that is precisely what he did.

During a conference call held on November 15, 2003, I was informed by Goldner that not only did DOE not intend to ever provide any funding to anyone for the purpose of remediating radioactive emissions in spent nuclear fuels, he insisted that it is and will continue to be DOE's policy for the next 40 years to encapsulate and bury every ounce of high-grade nuclear waste material stored in the US under ground at Yucca Mountain.

Further, he told us that any attempt to obtain any high-level nuclear waste materials for testing by anyone, including government funded laboratories, would be arrested and jailed without access to legal counsel under the Export Administration Act. I still don't know what the EAA has to do with remediating radioactive emissions, but that is what he said.

In 1999, while Elliott Richardson was Secretary of DOE, NRT was awarded a discretionary grant of $2,000,000 for the purpose of advancing its test schedule. The work was to have been undertaken in concert with Dr. George Miley, physicist in residence at the University of Illinois at Champaign-Urbana – Dr. Miley's laboratory at the Champaign-Urbana campus was level 2 accredited by DOE, and was therefore acceptable as a test and development site. However, within less than 90 days after the announcement of the grant had been published, pressure from within the Department rose to such extraordinary levels that Secretary Richardson was forced to withdraw the grant, albeit grudgingly.

The only similar technology ever contemporaneously developed in the US for the remediation of radioactive emissions in high-grade nuclear waste materials was developed in the late 1990's by Dr. Paul Brown and his colleagues at World Atomics in Colorado Springs, Colorado. After being granted several patents for the 'Nuclear Spallation Device' he designed, Brown contracted with several Japanese contractors to build three successively powerful prototype versions of his device.

He had them built in Japan because DOE actively intervened more than a dozen times to prevent US companies from building it. The problem with Brown's device was that it was little more than a small, semi-controlled nuclear fission-powered device designed to continuously bombard nuclear waste material targets with a highly charged gamma ray field. Because it was so dangerous to operate, Brown was never able to obtain the necessary State Department or UN transport clearances to have it shipped across international waters into the US for further testing and development.

As you may recall, Dr. Brown was killed shortly thereafter under the most questionable of circumstances, just as the utility of his nuclear spallation technique was about to be publicly demonstrated in Japan.

(Only a month before he died, Dr. Brown met with me, Gary Vesperman, and a few of my business and science associates in Henderson, Nevada to present his method of neutralizing radioactive waste. His method is No. 13 in my list of methods of neutralizing or disposing of radioactive waste in http://iiic.de/docs/GVComparison.htm. A few weeks after Brown's suspicious fatal car accident, Art Rosenblum also died in a car accident. Rosenblum had been enthusiastically promoting Randall Mills' Blacklight Power Inc.'s energy source.)

We have known how to safely remediate radioactive emissions from spent nuclear fuels, both liquid and solid, for nearly a decade. We have the test data and prototype apparatus to prove it. That data, including all the protocols, policies, procedures and experimental design criteria associated with our work have been submitted to DOE many times over – Dick Shamp can tell you all about it if you want to go to the trouble to ask him – with the net result that DOE will not allow the US Postal Service to deliver our proposals any longer. If you want to see what is really going on with nuclear remediation, this is a very good place to begin.

Thanks for writing your article – you're about to find out how big Pandora's box really is.

David G. Yurth, Ph.D.
Director Science and Technology
Nuclear Remediation Technologies, Inc.

(Yurth's letter to Tetreault has not been published in any Las Vegas publication. Why? Maybe to protect the profitable contracts to be generated by the DOE-estimated $150 billion lifecycle cost of the Yucca Mountain Nuclear Waste Repository? Gary Vesperman)

Paul Brown: Hyper-Cap E-Converter

Paul Brown, Ph.D., had invented this device which Gary Vesperman wrote up for his "Advanced Technologies for Foreign Resort Project" (see http://www.icestuff.com/~energy21/advantech.htm).

"Perpetual Battery. The hyper-cap E-converter is a thick quarter-sized battery which would put out .001 watt "forever" for such applications as critical components inside fail-safe computers, cellular telephones, etc. The energy comes from tapping ether fluctuations."

The following is excerpted with permission from "Inventor Paul Brown's Nightmare Story", *Electrifying Times*, Vol. 10, No. 1, www.electrifyingtimes.com. His story originally appeared in Jeane Manning's book "*The Coming Energy Revolution*" www.jeanmanning.com.

Brown invented a novel method for converting natural radioactive decay material into electricity in the form of a battery. In February 1987 the proud inventor and his associates at a private research company in Boise, Idaho, decided it was time to make a public announcement of his discovery.

A series of traumatic events followed. The Idaho state departments of health and finance filed complaints against both the company and Brown. His license for handling radioactive materials was suspended. He began to receive anonymous threats, such as "We will bulldoze your home with your family in it."

Relocating the company to Portland, Oregon, did not stop the troubles. Despite the fact that a 1988 Fortune magazine article commented favorably on the nuclear battery venture, securities fraud charges were filed against Brown and his company. Oregon's finance department investigated, as did the Internal Revenue Service and the Securities and Exchange Commission.

After meeting each challenge, Brown redoubled his efforts to develop his technology, but events worsened. His young wife was assaulted. Even in their home they did not feel safe; it was robbed three times and vandalized on four other occasions. Brown was accused of drug manufacturing and eventually lost control of his company. The Browns' also lost their home. Finally, the pipe bombing of his mother's car in the early 1990s drove Brown to become a recluse.

"I understand now why inventors drop out of society." he said in a 1991 open letter to other new-energy researchers. His advice to them! "Keep a low profile until you have completed your endeavor, be selective in choosing your business partners, protect yourself and your family, and know that the nightmare stories are true." Brown eventually died in a suspicious car accident in April 2002.

Ira Einhorn: Free Energy and Mind Control Researcher

(Excerpted from "A Snapshot of my 70's" by Ira Einhorn, September 1, 2002)

… What Geller could do, I saw a lot of it first hand, indicated that the basic physical framework in which physics operated was inadequate and that so called "free energy" devices -- devices that would solve our energy problem and end what is now called global warming and allow for the decentralization of most economic activities -- could become a reality. Hence I circulated all previously known anti-gravity information and all the emerging work on "free energy" devices.

Unfortunately, all new technology can be used as weaponry as well as for human benefit. So, I was soon up to my ears in a multi-pronged intelligence game that is still waiting to be unraveled…

… So when the opportunity arose, after a series of dinners and meetings in Princeton and New York with Bogdon Maglich, the head of Migma Fusion, the only private nuclear fusion research operation in the United States, and a number of Yugoslavian government officials, I agreed to help organize a large Tesla celebration. To this end, I enlisted the support of the president of the prestigious Franklin Institute in Philadelphia, Bowen Dees, and after a stint at Harvard and with the blessing of the Yugoslavian Consul-General in New York, I went off to Yugoslavia, to spend days at their expense, as an unofficial ambassador.

I was planning to do many things during this celebratory conference that would have linked the Tesla Museum in Beograd with the Franklin Institute in Philadelphia: besides giving Tesla his just due and showcasing his achievements in a major exhibit at the Franklin Institute, while holding a major international conference on his works, I would also have organized a smaller conference on the suppressed aspects of his work in mind control and free energy and found a way to directly demonstrate mind control to those who came to the conference.

In the fall of 1978 I was a Fellow in Residence at the Institute of Politics within the Kennedy School at Harvard. I taught one course, ran a small lunch time chat series in which Harvard luminaries, Ambassador Reichauer, E. D. Wilson and Karl Deutsch, among others, ate and chatted with 5 or 6 of us for a couple of hours; I lectured in every conceivable venue at Harvard, conducted a number of public symposiums, brought a number of the members of my Network to Harvard to lecture, ate dinner with a host of well known political figures, and made an inordinate amount of noise about mind control technology and the Russian Woodpecker to, among others, then CIA head Stansfield Turner. This lead to a meeting in the Boston Airport, arranged by one of JFK's chief aides, on the matter with a top defense intelligence scientist who ended up spending the evening with me and giving me his home telephone number.

In 1979 I received a small private foundation grant to study free energy devices in preparation for a large involvement in such activities. I was planning to visit all of the inventors personally and then prepare a report that would have formed the basis of a venture capital enterprise that had been encouraged, due to some of my mailings, by a number of my affluent friends. The objective was to develop and bring one device to the marketplace…

…All was not to be. I was busted for a murder I did not commit, and all my work on mind control and free energy became history. [signed] Ira Einhorn September 1, 2002

The following is excerpted from Ira Einhorn's July 5, 2002 email:

Robert Eringer proposed all kinds of book schemes for me; schemes in which I was not interested. Nor did I find any of the people my agent sent to me, re: the biography, to be of interest. Thus when Eringer suggested he would like to look at my fourth novel, Cantor Dust, which was near and dear to my heart, I informed my agent and sent it to him. Eringer was very enthusiastic about it. He said he would prefer to do my autobiography, but would work on getting my novel published as an opener to getting my autobiography. I said he was welcome to try. Thus began a continuous stream of many hundreds of e-mails between this alleged intelligence operative and myself, broken only by his journeys to England, wherein he told me he saw a number of publishers without success and one new house that agreed to publish Cantor Dust when they were actually in business, and his family vacations. We were still at it the day I was extradited to the United States: July 20, 2001… [Deleted]…

One of Robert Eringer's closest associates is Claire E. George, past Deputy Director of Operations for the CIA, in charge of covert operations for the entire planet. Sources who have researched the situation indicate that Claire E. George and Robert Eringer have worked together on a number of operations, still work together and have a pile of money at their disposal.

Einhorn presents the highlights of his case in http://groups.yahoo.com/group/Ira-Einhorn/message/454.

"We'll know our disinformation program is complete when everything the American public believes is false." -- William Casey, CIA Director (from first staff meeting, 1981) (Source: THE BROTHER JONATHAN GAZETTE DAILY DIGEST Wednesday June 28, 2006.)

How much is good press worth? To the Bush administration, about $1.6 billion. That's how much seven federal departments spent from 2003 through the second quarter of 2005 on 343 contracts with public relations firms, advertising agencies, media organizations and individuals. (Washington Post; Feb. 14, 2006) (Source: http://www.washingtonpost.com/wp-dyn/content/article/2006/02/13/AR2006021301897.html?nav=hcmodule)

Thomas Henry Moray: Radiant Energy Pump/Electricity Generator

Thomas Henry Moray, Ph.D., (August 28, 1892 - May, 1974) was an inventor from Salt Lake City, Utah. Moray graduated from The Latter Day Saint's Business College. Moray studied electrical engineering through an international correspondence school course. He received a Ph.D. in electrical engineering from the University of Uppsala.

T. Henry Moray's research dates from the time he was 9 years old (1901). Over the 73 years of Moray's research, he left behind him a wealth of notes, not only pertaining to radiant energy, but a wide range of scientific research bordering all the way from the devulcanization of rubber, the influence of mineral reactions in the presence of high energy, bio-electronic effects (electrotherapy), sound pick up, solid-state physics, and finally the detection of energy that constituted the major endeavor of his work.

Moray was a pioneer in the field of electrical energy. As a youth he greatly admired Nikola Tesla and in particular was very interested in Tesla's obsession with the earth having a limitless supply of energy available to it from the universe. Like Tesla, Moray wanted to find out how to tap this energy. Like a lot of people he became amazed at the "crystal radio" where a crystal can be tapped with a fine wire to make a radio work – without any battery or power. Moray figured that if this was possible it should be possible to find a crystal (or "magnetic rock") that could be tapped for a power source.

Moray became very interested in the properties of certain rocks and crystal structures and the powders from them. He actually developed and utilized a transistor more than 20 years before anyone ever dreamed of such things. These solid materials are what he made his so-called Moray valves out of; they were like radio valves *but were not using a heated coil* like radio valves (also known as vacuum tubes in today's terminology). They were all cold with no external power to feed them. They were a mixture of semi-conducting materials and intricate one-way conducting materials (diodes in today's terminology). The Moray valve was therefore a solid-state device – unlike a radio valve that heated a plate to produce energy.

It is well documented that Moray developed a bipolar semiconductor as early as 1927. His germanium "valve" was working in 1931. In the 1930s Moray developed advanced semiconductors and transistor-like devices.

Moray provided a complete disclosure of his semi-conductor research to Dr. Harvey Fletcher of the Bell Laboratories. Dr. Fletcher later became head of the department at Bell Laboratories that developed the transistor. Moray, therefore, could be the true father of modern electronics since his work predated the Bell Laboratory bipolar transistor findings by at least 20 years.

During the 1930's T. Henry Moray was refused a patent on his cold semiconductor cathode because the patent examiner couldn't understand how it could emit electrons. The patent examiner reported that he could not allow the patent because he could not see how it would work since "the cathode had no means of being heated".

"He tried to patent his device, but the requests were denied because the item he called the "Moray valve' was too new a thought for the patent examiner. It was actually a germanium transistor, and solid states were unknown at the time." his son John Moray said. 20 years later the development of the transistor apparently proved that his device could actually have worked.

Both Nikola Tesla and Thomas Henry Moray consider harnessing cosmic energy (vacuum or zero point energy in today's terminology) as the most practical method of producing energy yet discovered by man. Furthermore, they thought it is possible to utilize this vast source of energy from the universe without a prime mover at any point on the earth or in space – on the ground, in the air, on the water, under the water, or even underground.

Radiant energy is energy that is transported by waves. This includes energy transmission in the form of waves through space or various media. Radiant energy is also energy transferred through electromagnetic waves. Solar energy is a type of radiant energy. Radiant energy is the sum total of all the energy that comes to the earth from all the universe. The earth also reflects back radiant energy into the universe. Our sun directs electrically charged particles towards us. Radiant energy may be calculated by integrating or summing radiant power with respect to time. Radiant energy is usually expressed in joules.

During the 1920s Moray demonstrated a "radiant energy device" to many people who were unable to find a hidden power supply or batteries. Moray called his device a solid-state detector or the "Moray valve". It basically comprised of a large antenna connected to a complex series of high-voltage capacitors, transformers, and semiconductors. By supposedly stimulating the existing oscillations of radiant energy from space, his device could generate electrical power without any man-made power input. By 1936, Moray had eventually engineered his device so that a 55-kilogram version could constantly produce 50 kilowatts of power for several days.

An electrical generator may be considered as not in the true sense a generator – as electricity is not made by the generator – but is merely an electrical pump. Moray's radiant energy device may then be referred to as a cosmic ray pump: that is, a high-speed electron oscillator serving as a detector of cosmic radiations which causes a pumping action or surging within its circuitry. Moray used the term "radiant energy" to describe that source of energy coming from the cosmos to earth and radiating from the earth back to where it came. This is the energy the Moray device captures and could be described as those particles of energy pervading all space.

What sort of an apparatus is Moray's radiant energy device? Briefly, it would appear to be similar to a radio receiving set of power proportions.

An antenna is connected to a 29-stage solid-state collector material; a small rounded pellet mixture of triboluminescent zinc, a semiconductor material, a radioactive or fissile material, and germanium. The device contains two coils of wire, or inductances. It also contains several condensers, or capacitors, of different sizes. There is a detector tube, or electronic valve, and two oscillator tubes. Added to this is a "bar of silver and a bar of copper", a starting device, and a step-down electrical transformer, reported to be 1000-to-1, primary to secondary.

After tuning of the device the semiconductor material acts as a one-way gate (diode in modern terminology) for surges of high-frequency background atomic ion energy which can go through the material more readily in one direction than the other. For conversion of ionic to electromagnetic energy to then be transformed into useful electrical power by conventional radio circuitry and a transformer, the device must be grounded.

All of this was enclosed in a box measuring about 30 inches long by 16 inches wide by 16 inches high. It weighed about 30 kilograms. There were no moving parts. Moray said there are no dangerous radiations surrounding the box when it is in operation.

Moray's 30-kilogram radiant energy device produced 4 kilowatts of cold electricity which was able to power light bulbs. However, electric motors require special winding to increase their efficiency. While commercially available electric motors will operate on the power from a radiant energy device, they are not as efficient as motors running on ordinary commercial currents. Moray says when his motors are running in the dark they glow with a violet aura. His motors ran cold!

It has been estimated that using current dielectric technology that a 50-kilogram radiant energy device could be built to produce 300 kilowatts – sufficient to power buildings and also electric vehicles.

Some persons who have seen radiant energy power lights say the bulbs look as if they were filled entirely with white light, as if the gas itself which fill the bulbs were fully incandescent. Moray believes this to be true.

Radiant energy will heat electric flat irons and other electrical heating devices. It is claimed heating capacities are reached much more quickly with radiant energy than with commercial currents, and are considerably hotter than when powered with ordinary electric energy.

One photograph shows Moray demonstrating his generator as it powers 50 100-watt light bulbs and a 655-watt Hotpoint iron. Thus he proved that his radiant energy device was not running off batteries – as his detractors said it did.

By 1936 he had developed a generating unit that weighed about 55 pounds and was capable of producing as much as 50 kilowatts of power on a steady basis.

On several hundred occasions Dr. Moray lighted a bank of 35 light bulbs with power from his simple but ingenious radiant energy device. There were 20 150-watt bulbs on the panel. At the same time the generator powered a 600-watt glow heater and a 575-watt flat iron.

Moray, as Nikola Tesla before him, was unsuccessful in introducing his devices working on this principle. Some report that his secret was forgotten. Moray tried for several patents to no avail.

These valves are ONE reason why patents were continually refused – as he was told "there is no such thing as free energy".

"You must put energy in to get it out." As patents were applied for, there were refusals due to the fact that the patent applied for "infringed other patents". Even thought Moray patiently wrote details of how this could not be, the US Patent Office refused to allow any.

On the other hand, Moray gradually had perfected his device's output from a capacity to light one small incandescent light bulb to a present capacity claimed to be 50 kilowatts. Fifty kilowatts represents about 67 horsepower and, certainly, 67 horsepower is not to be disregarded. Many small factories do not use as much as 67 horsepower.

According to Moray, one of his radiant energy devices can be built for about $800 (year is unknown as there has been considerable inflation). Mass production methods might cut this price in half. Under these circumstances, a unit in a home would bring about a substantial saving in power bills over several years time.

As many as 100 persons have witnessed radiant energy demonstrations. Radiant energy, as it emerges from the Moray apparatus, may be considered a form of electricity. It is an alternating current, but an alternating current of very high frequency.

If a photograph of a single bulb lighted with radiant energy is taken the print shows a large, dark ring, perpendicular to the base of the bulb. This ring looks like a circle of translucent black fog. It seems the light somehow reflects itself on the air, or projects a shadow of itself there.

The demonstrations attracted newspapers and scientists from Bell Laboratories and from the Department of Agriculture, but none could attest to how the device actually operated nor could evidence of fraud be found. Even though eminent scientists examined his device during and after its operation, and admitted that they could not understand the source of the power they had witnessed, still he was never able to gain their support for his work.

Moray refused to sell his technology to corporate interests, fearing its misuse.

In the later 1930's engineers from the Rural Electrification Administration (REA) were ordered to work with him by President Franklin Delano Roosevelt. A controversy grew between the inventor and the government engineers. As a result Dr. Moray charged that the REA was trying to sabotage his work.

Moray reported that he and his family had been threatened and shot at on several occasions. His laboratory was ransacked to stop his research and public demonstrations. Repeated assassination attempts were made against his life. It was necessary for him to bulletproof his automobile since he was shot at while driving down the public street. Small wonder that Moray developed an extremely alert and suspicious nature, and visitors to his desk often noticed a fully loaded pistol lying on the desktop within easy reach of his hand!

In 1940 Moray demonstrated before the members of the Public Utilities Commission (in Utah?) his free energy generator. It maintained a continuous output of 250,000 volts with no apparent input.

The next day Moray was found shot in his lab, and all of his notes were stolen. Moray had been wounded by shotgun pellets in his lab by an attempt to frighten him into handing over the secrets of his work. Except for his own skill with a pistol to successfully defend himself against his assailants, Moray would have been murdered.

An REA engineer named Felix Frazer who was Moray's assistant had gone berserk and smashed the Moray device with an axe. It was never rebuilt. The frustrated inventor could not afford to duplicate his invention. He went to his grave many years later convinced that the destruction of his device was part of a communist plot. Frazer apparently was angered that Moray would not sell his device to corporate interests.

There is a rumor that to stop the USSR getting this technology the equipment was destroyed by Moray's assistant. Or, the equipment was destroyed because Moray refused to unconditionally hand over all aspects of the devices he had built. It was further claimed that one of his sons dumped the entire contents of Moray's laboratory into a river – because of continued threats and harassment – not only to himself but to his family as well.

The entire truth may never be known, but it is a fact that Fraser became enraged and grabbed a sledgehammer and smashed Dr. Moray's device to pieces.

"Dad believed to his dying day it was all part of a communist plot," John Moray said. "He had refused to cooperate with certain known communists so his invention paid the price," Moray added.

"It certainly smacks of some kind of conspiracy," the younger Moray mused.

The tragedy of it all was in the fact that Dr. Moray's years of research and development, and his entire fortune were wiped out when his device was smashed with a sledgehammer. It had taken Moray 20 years and $200,000 of his own money to develop it.

"Because of the expense and hardship in rebuilding the generator, which the patent office had refused to consider, my father never actually completed more than one unit at a time as he perfected it.

"Each updated model used parts from the previous model as he made improvements in successive stages."

Another factor in the total destruction of this marvelous technology was the demise of the various companies that provided Dr. Moray with components. Both the Great Western Radio Co. and the Baldwin Electric Co., which he worked with vanished as part of his resources.

"Inflation, the massive war effort and threats to my father's life spelled doom to any ideas he may have had for replacing the destroyed generator device," the younger Moray claimed. However, more than $200,000 in the late 1920's and early 1930's would indeed translate into many millions today.

Make no mistake about it; Dr. Moray did what he claimed to have done. He had achieved free energy. The Soviet Union even offered to provide him his own fully equipped laboratory in Russia, with no expense spared, and to back his experiments fully. Fraser could have been a trained Soviet agent who had succeeded in working his way into Moray's confidence and gaining access to Moray's laboratory as a technician and assistant. When Moray still refused to give his invention and services to the Soviet Union, the assistant destroyed the device, smashing it to pieces with a sledgehammer.

Sadly, T. Henry Moray died with his dream unrealized and the original device destroyed.

Walter Rosenthal (Reporter): Small Electrical Power Converter

Walter Rosenthal was a retired aerospace engineer with some test equipment such as oscilloscope and voltmeters. He had closely followed for a long time development of new sources of energy and personally knew some energy inventors. (Rosenthal recently passed on from natural causes. He received much praise for his careful energy invention measurements. See for example Thomas E. Bearden's eulogy in http://peswiki.com/index.php/Site:LRP:Tom_Bearden_Remembers_Walter_Rosenthal_%26_Floyd_Sweet)

More than twenty years ago, Rosenthal became involved with an inventor's invention of a small electrical power converter. Something about converting a flashlight battery's DC to 4 watts of power with a high conversion gain. He realizes now that it would be a very valuable invention because it could be used in cell phones, laptop computers, portable radios, etc.

Then the inventor got a call from a man representing Atlantic Richfield (now ARCO). They offered the inventor $40,000 to take it off the market. Otherwise, they would subject him to troubles, etc. He refused. They eventually offered $400,000.

One day he came home to find a group of men going through his apartment. He asked them to leave, and has had no further confrontations. He has not done any further development work on this device. Perhaps consequently, as of a few months ago, he was still alive and well. That energy device is still not on the market.

Later on, Rosenthal figured out that the Atlantic Richfield people could only have known details about the invention by tapping either his or the inventor's telephone.

Joseph C. Yater: Heat-to-Electricity Converter

In September 18, 1975 Joseph C. Yater invented a heat-to-electricity converter that he says will cost the consumer approximately $200 and would be up to 90% efficient. The device operates by capturing "fluctuation voltage" (the static noise heard on radios and amplifiers). The rooftop device would be heated by the sun and use millions of microcircuits to tap the freed electrons from heated molecules. Yater took his device to the U.S. Government, which declared that his device had "real potential". After promising him a working model within 6 months, the U.S. Government came back to him with the reply that the device would be impractical. Subsequent scientific analysis also revealed flaws in Yater's reasoning.

Adam Trombly: Trombly-Kahn Closed-Path Homopolar Generator

During the early 1980's Adam Trombly and Joseph Kahn, Ph.D., co-invented the Trombly-Khan closed-path homopolar generator which has an output power exceeding its power input by a factor of 4.92. The patent application and drawings represent the result of the expenditure of $290,000 in two phases. Their US patent application was rejected twice on the grounds of impossibility that the machine could work. Then the United States Patent Office notified the Department of Defense. Instead of congratulations, Trombly and Kahn received a secrecy order. The two authors were warned not to publish any information on the basis of violation of secret homopolar generator work being done concurrently in the U.S. Government's Department of Defense.

Adam Trombly, the senior designer of the machine, received two written gag orders from the Department of Defense – forbidding him to reveal details of the machine – upon threat of 10 years imprisonment for violating security relating to homopolar generator design. The DOD-imposed secrecy has prevented any recompense whatsoever from accruing to the men who performed this work.

According to information obtained under the Freedom of Information act by the Federation of American Scientists, the Pentagon placed 774 patent applications under secrecy orders in 1991 – up from 290 in 1979 – and 506 of these orders were imposed on inventions by private companies. The U.S. Government has standing gag orders on several thousand inventions.

In 1989 Adam Trombly proposed the retrofitting of the Four Corners coal-fired power plant with an advanced Trombly-Khan closed path homopolar motor-generator. Trombly and Farnsworth estimated that the cost of such an advanced electrical generator to be approximately the cost of installing smoke scrubbers on one coal-fired generating unit. (Sources: http://www.rexresearch.com/trombly/trombly.htm and http://www.broandrew.com/suppression.html.)

Adam Trombly: Trombly-Farnsworth Solid-State Oscillating EM System

Adam Trombly also co-invented with David Farnsworth the Trombly-Farnsworth solid-state oscillating electromagnetic (EM) system. In June of 1989 Adam Trombly and David Farnsworth of Zero Point Technologies, Inc., demonstrated a solid-state resonant device which physically produced over fifty times greater electrical output than input at the Church of the Holy Covenant just prior to a major address by Trombly at Dag Hammarskjöld Auditorium in the United Nations. The demonstration had originally been scheduled to coincide with Trombly's address.

But at the last minute Trombly and Farnsworth were informed by the Director of the United Nations Environment Programme, Noel Brown, that United Nations Security personnel refused to allow the demonstration in the Auditorium for security reasons. (The Church of the Holy Covenant was no longer used as a church but was used by the United Nations as an alternate venue for the demonstration of "sensitive" technologies such as that belonging to Trombly and Farnsworth.)

The demonstration was attended by fifty people including five major Wall Street executives, several engineers, and a Senior Engineer from Boeing Corporation Dr. Charles (Chuck) Clark. Clark had been allowed to spend several hours alone with the technology prior to the New York demonstration. Clark had checked for every conceivable trick that might be used to deceive naïve or unwitting observers.

The demonstration went perfectly. Many present stated that they felt they had attended a historical event; one that would help the human species emerge from the economically stratified and earth destroying dark ages of fossil fuel technology and into a time of universal, pollution-free electrical power. Some participants/observers were moved to tears by the ramifications of what they had witnessed.

After the demonstration the entire entourage proceeded to Dag Hammarskjöld Auditorium where Trombly addressed the standing room only crowd. He asked all of the witnesses to stand, and they did.

He then asked Dr. Clark to comment on what he had seen. Chuck said, "I am not here representing Boeing. I am here because I was hired to find out if this technology really works. I can't tell you how this thing works. David and Adam can explain that better than me. What I can tell you is that it does work exactly as Adam has just said. I have checked for every trick in the book, and all I can say is that this works."

There was a stunned air in the room. When Trombly finished there was a long standing ovation which was followed by a very long walk from the front of the Auditorium to the entry foyer. One senior diplomat called it “One of the longest standing ovations in the history of the UN.”

There were just so many people from all over the world expressing their excitement that it took nearly forty-five minutes for Adam to get through. By the time he reached the foyer he saw the five Wall Street executives were huddled up with a man whom Adam had introduced the day before as one of his best friends. They looked anything but happy. As Adam approached, one of them took him aside and said, "Your friend just told us that you faked the demonstration. Is that true?"

"Are you kidding? My entire life has led up to this moment. The future of this planet will depend on the development and deployment of these technologies if we are to have any hope of surviving the hell we are currently creating for ourselves." Adam was stunned.

"I do not know what his motivation is for saying that. He is not a scientist nor is he an engineer. It just doesn't make any sense."

"Well, you said he was one of your best friends. So you have to understand that our commitment of $500,000,000 is withdrawn until we can sort this out."

In an instant one man had obstructed history for us all. He misrepresented the truth even after the real professionals had agreed that the technology worked, and that there were no tricks. Adam later realized that this individual had cleverly infiltrated his life and won his confidence. He had torpedoed the future.

Adam did hours of interviews that afternoon and into the evening. Dr. John Lilly also asked to be interviewed. He said, "This is the most wonderful and exciting thing I have ever seen! I am coming out of retirement to help Adam promote this thing. Maybe we do have a future that’s worth living in after all."

The following Monday Trombly and Farnsworth presented a similar demonstration to some Congressional representatives in the US Senate Banking and Finance Committee Hearing Room. After the Congressional demonstration, Trombly commented: “Here is a technology that points to a better future; a future free of the taint that the politics of scarcity casts upon us all.”

After these demonstrations Trombly indicated that he had so far survived 47 assassination attempts over this technology which apparently threatens existing energy industry monopolies.

While David Farnsworth was in their $20 million Oregon shop/lab, early one March morning in 1994, badge-wearing US Marshals broke in with sledgehammers and chainsaws. Farnsworth watched with his wife and a friend from a motor home while they ransacked his lab and took the energy machines away.

They recklessly removed expensive electrical devices including expensive spectrum analyzers, earthquake forecasting devices and advanced generating equipment away from walls and shelves. They carelessly stacked them in waiting trucks and vans to be transported to a federal warehouse in north Portland.

The supposedly law-abiding U.S. Government employees also took home thousands of dollars of Farnsworth’s expensive ham radio equipment.

The US Marshals then filed charges against David Farnsworth and took him to court. Eventually, those charges were dropped.

Adam Trombly has had a total of 54 attempts on his life. One of the latest occurred early in 2006. Also, a suspicious incident occurred July 4, 2006 when Trombly was visited at his Aspen, Colorado home by a man of Middle East origin from Las Vegas who knocked on his door and earnestly tried to give him ten free cases of meat. Having been previously forewarned, Trombly refused, even after an additional offer of a free freezer, fearing the meat had been poisoned. This incident indicates that an energy invention suppression hit squad might be based in Las Vegas.

(References: June-December 2006 emails by Adam Trombly and Bruce Meland to Gary Vesperman. "In Search of Quantum Motors and Generators" by Bruce Meland, *Electrifying Times*, Spring-Summer 2006, Vol. 10, No. 1, www.electrifyingtimes.com. The book "*The Coming Energy Revolution*" by Jeane Manning. Tom Bearden's web site www.cheniere.org/correspondence/080301.htm.)

Gary Vesperman: My Car was Fire Bombed July 3, 2006

John Martens and I share the rent on a house in a nice, relatively crime-free neighborhood in Henderson, Nevada. The evening of July 3, John rode home on his bicycle at 9:45 p.m. The streets were quiet with no one walking in our neighborhood. He left on his bicycle 15 minutes later in a different direction. He still sees no people around. He does recall having a spooky feeling that someone was watching him leave and looked back a couple of times as he was riding away.

At 10:15 p.m. I went to bed and shut off my bedroom light which can be seen from the street. A few minutes later John's dog Coyote started barking. I let her bark for a couple of minutes hoping she will stop. I got up, looked out the front door, and could see what appeared to be fireworks burning in the street behind the car. I walked to the car, looked in the rear window, and saw the bottom of the back of the driver's seat burning!

I ran back into the house, called 9-1-1 and reported my car on fire. The firemen came later than I thought they would and with an iron bar proceeded to break all four door windows, even the two small windows in the two rear doors. I had jangled the car keys in front of them when they had arrived. They then found that the driver's side door was unlocked and sprayed water on the burning driver's seat to put out the fire.

They told me to wait for their arson investigator. He found on the driver's seat the carcass of an incendiary fire bomb three inches long and an inch wide. He said it burns at 2000 degrees.

The next day, being July 4, I asked two fireworks sales stands about it. It is illegal in Clark County where Las Vegas is located. It can be bought at Indian reservations fifty miles north. It appears whoever threw the firebomb in my car knew what he or she was doing.

I asked my mailman who has been delivering mail in my up-scale neighborhood for over ten years. He said he has NEVER seen a car torched in our neighborhood during all those years. My car is only one of numerous vehicles parked in our neighborhood. Yet my car, which is registered in my name, was the one targeted.

The car is a 1991 Chevrolet Corsica which had been painted, its interior in good shape, and has a fuel-efficient strong power train with new tires and many new parts such as new brakes, muffler, etc. It would have been a nice high-mileage reliable car for several years. In addition to the firemen breaking all the door windows, the roof lining burned and there are other burns and melted plastic parts. The interior is a mess. John is a certified auto mechanic and had spent many hours restoring it. John and I eventually had the car towed away to a junk yard as a heartbreaking loss.

Adam Trombly has had a total of 54 attempts on his life. One of the latest occurred early in 2006. Also, a suspicious incident occurred July 4, the day after my Corsica was firebombed, when Trombly was visited at his Aspen, Colorado (?) home by a man of Middle Eastern origin who knocked on his door and earnestly tried to give him ten free cases of meat. Having been previously forewarned, Trombly refused fearing the meat had been poisoned. The man became upset and even tried to add a free freezer. He then gave up and told Trombly he had to get back to Las Vegas. A few minutes later, Trombly took a walk and found the man sitting on a sidewalk curb talking on his cell phone.

Trombly's report hints that an energy invention suppression hit squad might be based in Las Vegas.

One of my energy inventor friends, who himself has been a target of energy invention suppression, happened to visit me a few weeks later. He has emailed "What I witnessed at Gary's house was no teenage prank. It was obviously intended to totally destroy a car, not just scratch the paint or leave a scar. With several other cars parked at the same house, Gary's was obviously targeted, not just the easiest to reach."

Three weeks before my car's firebombing, I had published on the Internet the third version of this compilation of energy invention suppression cases which can be read in www.byronwine.com (do Find for Vesperman). Other sites can be found by entering in the dogpile.com search engine Vesperman suppression.

So it may be that the energy invention suppression terrorists, possibly based here in Las Vegas, had retaliated by firebombing my car. I don't feel intimidated at all. In fact I am mad and more determined than ever to help end energy invention suppression.

Adam Trombly (Interview): The Truth about Zero Point Technology

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The Truth About ZP Technology: A Wake-Up Call to the American People – An interview with Adam Trombly by Celeste Adams

Adam Trombly is one of the top scientists in the world in the development and creation of zero point energy technology. Devices that he built are working today in other parts of the world. And yet, instead of using zero point energy, Adam Trombly's own house in Maui is being fitted with a bank of expensive solar panels.

Why can't Trombly use his own expertise to fuel his own home? Trombly has spent most of his professional life under one gag order or another. But he decided, he told us, "that if I was going to give an interview for this particular publication, I wasn't going to pull any punches."

If much of this seems overly negative, keep reading. Trombly wants to wake us up, and to shine a light upon things that have been kept dark. But his grounding is deeply spiritual. It's just that the Divine forces that seek to assist us cannot do so unless we call upon them. "Now, in this moment," he tells us, "we must come out and ask for help. When we can ask for help, we get it."

Adam Trombly's revelations will shock you to the depths. But it is his hope, and ours, that it will help you to awaken, or to assist you in your task of awakening others.

Trombly's ultimate vision is the "redreaming of the American Dream."

Adams: How did you become interested in free energy?

Trombly: I was raised as a scientist and I have spoken the language of science all of my life. My mother was a blood specialist, my father was a biochemist, and my sister was at one time a biophysicist.

When my father had just gotten his Ph.D. in biochemistry from Purdue University — I was a young child — he was enlisted as a biochemist, by a fellow Purdue alumnus named Frank Olsen, into a U.S. Air Force/CIA joint project. He was stationed at the biological warfare laboratory in Fort Detrick, Maryland. This was in 1952 during the Korean Conflict. He had been a highly decorated U.S. Army Air Corp officer in World War II, but the government felt that he had a skill of strategic importance to the national security.

At Fort Detrick, he and Olsen, along with a couple of other scientists, were working on a very compartmentalized project. Since he died when I was in the eighth year of this body, I knew very, very little about what this project involved. On the seventh anniversary of his death (4/3/1967) I was in my mother's attic, putting out mousetraps, when I discovered a couple of boxes that contained journals my father had kept during his time at Detrick. You weren't supposed to keep journals, but he did.

One of the things he wrote about in his journals was his exposure to alien technology that totally defied what were considered, at that time and even still to this day, the laws of physics.

He wrote a letter to Dr. Quackenbush, who was on his dissertation board at Purdue, saying that what he had seen challenged even his "most vivid imagination." This was right after he got there.

After he had been there about a year, the notes he wrote got really interesting. He specifically described various technologies which he stated plainly were of "alien origin." He described not only flying disk-shaped craft and their related energy and propulsion systems, but Extraterrestrial Biological Entities. His work was actually concerned with them.

On November 19, 1953, my father (along with Dr. Frank Olson and a couple of other colleagues) was taken by Dr. Sidney Gottlieb to a summer camp near Baltimore. While there, he and his colleagues were involuntarily given large doses of LSD in their cocktails; doses on the order of 10,000 to 15,000 micrograms. Olsen knew about the experiment, and out of concern for my father told him, "Harvey you have been given a psychoactive drug and you are beginning to feel its effects. Don't worry."

Olsen had also taken a large dose of acid, and later freaked out because he said he had, "blown the experiment." It was supposed to be a double-blind experiment for all of the participants other than Olsen. He was supposed to keep silent.

Frank Olsen continued to feel unsettled, and was rushed by CIA personnel to New York for psychiatric examination. Something terrible happened instead. Frank was bludgeoned in the head and then thrown from his hotel room window. He was murdered. This, at least, was the conclusion of forensic pathologists hired by Frank's son Eric in 1994.

My father filed an internal protest demanding an investigation of his friend's and colleague's death, and that was what ultimately triggered the events that killed him.

In January of 1954, under the illusion that he was being immunized from a new retroviral biological warfare agent, he was injected instead with a live virus that he had discovered during his research. He became extremely ill. In his notes, he indicated that he immediately knew. "They killed Frank," he said, "and now they have killed me. The difference is that I will die slowly, very slowly."

He died in 1960, from a form of lymphoma as eleven government labs did morphological workups of his cells.

When I discovered that his death had not been an accident of nature, I was heartbroken. I despaired of life. I sat with a knife a quarter inch into my chest, with blood already trickling down, begging whoever was present at Infinity to reveal the truth of existence.

And in the next moment, I suddenly had no doubt of God or, if you prefer, the Buddha Nature, and I saw things with great clarity.

Adams: Do you believe that we're in denial about the involvement of aliens in the affairs of this planet?

Trombly: The American public has been lied to for so long, they wouldn't be able to recognize the truth if Jesus told them personally.

It's very difficult for the American public to know what is going on. In many ways, we are a nation in denial, and all too often a nation of alcoholics and drug addicts. We are in incredible mass denial.

People see what are referred to as flying saucers and UFOs. Sometimes they are not saucers but triangles. Sometimes they're small, and sometimes they're huge and look like buildings.

It doesn't matter how many people in remote places or in cities see them, or photograph or videotape them. The perceptions are simply shut out.

There are amazing mind-control projects going on. People literally cannot maintain their attention span. More than once I have stood and watched crafts 100 or 200 feet over my head and had people say things like, "Well that's not an airplane," or "Oh, my God, are we actually seeing this?" "Is that real?"

But by the next day, the whole chemistry of denial has set in and those same people say, "Wow, that was a strange airplane, it was going really slow, or really fast, and how did it make that right turn?"

This is what got me started in free energy technology — though I hate the term free energy, because it's anything but free. Many have paid dearly for its advent. I don't even know what term I like at this point. I use the term Zero Point Fluctuation Technology — ZP Technology.

I used to have a company called Zero Point Technology. As soon as you put something like that on your shingle, you discover just how unacceptable this concept is to those whose growth stopped so long ago.

People are being bombarded with subliminal messages that tell them that aliens don't exist. Even The "X-Files," which is a joke (thank God they're canceling it), was originally intended, by Chris Carter, to be something more than just random amusement. It was intended to be groundbreaking. But there's government interference. And this is a huge subject. People don't understand that the "other U.S. government" has had contact for decades with cultures that aren't from this planet.

We're like the aboriginal people of New Zealand, or Papua, New Guinea, or any other remote tribe. When they see an airplane, they think that it is a God — or they at least, they used to. Of course, now they think that it's just people who are more primitive than they are, but who have technology.

We are the same way with "alien" cultures. We are the same way with really clean and advanced electrical technologies that could begin to help us understand just how wonderful and abundant Being — simply being — is.

When I got involved in ZP in 1979, I was warned by Buckminster Fuller that if we were successful there'd be hell to pay. If we were actually successful, then it could develop into a real nightmare, because the humans we're dealing with are a species that has been kept in the dark. We've been treated like mushrooms (which are kept in the dark and fed a lot of feces -- there's no nice way of putting this).

The extremes to which these people are willing to go to make your life miserable are phenomenal. They go out of their way to torment those who challenge their utter mediocrity.

Then there are certain people who hang around in the so-called free energy field, who speak at conferences and who have never discovered, engineered, or invented anything in their entire lives that is worthy of note. What they have done is mediocre at best. I won't name them, but they just haven't produced. These are the people who say, "No one has ever bothered me."

These are the same people who — behind my back and behind the backs of those who have actually produced functional technologies — say, "Well I've never seen anything that he's produced."

Adams: Can you tell us more about this alien agenda?

Trombly: I know that there's an alien agenda because my father wrote this in his journals. He said he had discovered that the U.S. government had become involved in its implementation. He went further to say that this alien agenda, in his opinion, was contrary to the good of the human species and the planet.

He believed that a sector of the military/industrial complex was involved in a program, basically, to transform our atmosphere, which is benign to our species and other Earth species, into one that is greatly reduced in terms of its oxygen content.

So this is a force which doesn't have good intentions for us. It is a force that would gladly exterminate us. And yet human beings act as agents for this force. The "human" species is exterminating itself, by its own hands.

My father spoke of alien agendas in his most secret thoughts. This was not something he spoke of in public. He would never have given this interview, I'll tell you that much.

Adams: What species is this alien force?

Trombly: I can't say, but I can say that the species that are trying to harm us are a tiny minority of a vast host of alien species. My father knew of a couple. It wasn't just one, even back then. This sounds very far fetched — I know it sounds nuts. But I decided if I was going to give an interview for this particular publication, I wasn't going to pull any punches.

Adams: Many of the people who read this will share your belief system.

Trombly: Well, this is not about a belief system. I don't like belief systems! This is about reality! We are the ones who are collectively destroying the womb of the Earth in which our species gestates, in which we evolve.

There are real terrorists in Washington, and even, I dare say, in the White House. (See http://www.nogw.com/shadow.html.) And we are very rapidly approaching the time when that statement will be considered criminal. The incident we call 9-11 was a mockery. Now, every time someone dials 911 they'll think of the evil demon Osama bin Laden who in fact is someone we helped to create.

Alkhaida was largely financed by the U.S. government. We gave the Taliban 128 million dollars last year to suppress the growth of opium in Afghanistan. Where do you think that money came from? Where do you think it went?

Everyone thinks the 9-11 was caused by Osama bin Laden and his cronies. There's no doubt that some of his money comes from Saudi Arabia, but the fact is that the U.S. government is the primary source of funding for the Taliban. Why? Because Dick Cheney and his cohorts want to build an oil pipeline through Afghanistan.

Adams: What has happened to the free-energy technologies that you've produced?

Trombly: Every single technology that I have either invented or co-produced is no longer in my possession. There's one in Arizona that has supposedly become a national security issue.

A former colleague of mine once went off on his own with a design that he and I had come up with. He built a device that was very successful — and is now in a can, and he is a shell of his former self.

Forget about whatever technologies I have had a hand in reducing to practice. We have heard from very credible sources that these are nothing compared to the technologies already being produced by certain prime contractors right here in the United States.

Why is it a national security issue? Why is a generator that generates several times more output than input a security issue? Why is it that the American people cannot enjoy what their tax dollars are paying for? Why is it that we have a government that is willing to deny the American people access to the very technologies they themselves are secretly producing?

It's not a joke. Our government has produced technologies, with our tax dollars, that could immediately begin to reverse the damage done by the irresponsible use of fossil fuels, and they are not allowed to be used.

They continue to pollute this atmosphere, and they continue to reduce the amount of metabolically available oxygen. Who could possibly benefit from that? What species do you know of that is actually better off today than, say, fifty years ago?

What is it that we do when we burn these fuels? We make fire. What is fire? Fire is a rapid oxidation process that releases heat. The real destroyers of the equatorial rain forest are forest fires, because of the incredibly poor husbandry. There's nothing good you can say about what's being done to this planet!

There are far too many people in the U.S. government and other national governments who are acting in a way that is completely moronic and self-destructive. It is not a human agenda! This is what I'm trying to get you to see. There is this whole other thing happening.

We are exploited by a corporate structure — by the "military-industrial complex" Dwight Eisenhower warned us against in his farewell address to the nation. Eisenhower got the term "military-industrial complex" from Mussolini, who was describing Fascism. These are words you don't want to use in our society.

At Project Earth we get mail from all over the world, and the one word that keeps coming up since our last so-called presidential election — about that debacle, that tragedy — is the word "coup." From the perspective of the vast majority of the human species, it was a coup. They say this in India, Japan, South Korea, France, Holland, Spain — everywhere. In spite of the fact that we never posted an article on our website that said or even suggested that we had a coup, people write to us and say, "How come the American people don't realize that they just had a coup?"

Then, following on that coup, we have 9-11. Everybody is terrified, but people don't want to talk the way I'm talking now. They think it's self-destructive.

I tell you truly, it is our collective silence that is truly destructive.

The United States of America is a sacred idea. It is a sacred thought-form. What was America to the people who risked and frequently lost their lives to create it? It was the New Jerusalem. The spiritual foundation of the United States of America is an absolute necessity of our spiritual dimension. It was founded on the basis of the absolute need of the human spirit for freedom.

But freedom brings with it great responsibility and demands great intelligence.

We do not want to live in hell, but we are creating hell for ourselves. We are tormenting each other and ourselves. We're doing these things as if we have no choice. We are truly brainwashed.

The real ultimate cult that's going on in America is this one of jingoistic, flag-waving, unquestioning patriotism. We can get ourselves all hyped up on Zoloft, and that still doesn't change the fact that we as a nation have lost an incredible amount of prestige and trust because of what happened in 2000.

No matter how much money we put into the military budget, we will not be able to restore that trust in our own people or in the rest of the world until, through grace or the incarnation of the Divine Process, our democracy is resurrected from its present contrived state. It is a travesty.

When Dick Cheney refuses to turn over documents to investigators, he gives comfort to our enemies. Truly dangerous and deranged people in truly difficult countries like Pakistan cite the actions of our corrupt public officials as justification for their actions.

If we say to the world that we represent Freedom and Democracy, then by God we have an obligation to be Free and Democratic.

In the meantime, the world laughs, because perfectly capable intelligence officers in the United States are oppressed for the sake of short-term political agendas.

The Central Intelligence Agency attempted to warn the White House before September 11. The entire affair was handled with what can only be called incompetence. While three-letter agencies spent our tax dollars listening to my calls, true terrorists were going to flight. And in spite of over an 18-minute warning crash, a second full-size passenger jet went into the World Trade Center.

Even so, we are all supposed to fall into line and cheer.

Once, in 1986, I was introduced to a man in Toronto, Canada, who turned out to be a major Soviet technology spy. When he offered me a lot of money and a lot of benefits if I would turn over mechanical drawings for an electrical generating technology I had co-invented, I told that agent to go screw himself. I told him I was under a gag order, and that I would not violate that order.

He responded by saying, "What loyalty do you owe to your country? They have done nothing to help you or your work. If you cooperate with us we will appreciate you and take good care of you and your family. Three hundred million people will benefit from your technology. Who cares if a shaft is made in Leningrad or if assembly occurs near Moscow?"

Once again, I told him to go screw himself, to go back to the totalitarian hell that he came from — and then I got the hell out of his office.

In September of 1986, I turned this man in to the FBI — and as a consequence, I ended up under investigation myself!

In February of 1987, the counter-intelligence unit of the FBI contacted me. During my second so-called "interview," one of the special agents who interviewed me was Robert Hanson, now known as a famous spy for the former Soviet Union.

Hanson interviewed me about whether or not I was a spy. But he knew I wasn't a spy, because he was!

It's not just the U.S. government that's suppressing all this stuff, it's the whole theater of this species. The "human" species has rarely demonstrated qualities that say that it should be maintained or can be sustained.

This species has never acted in a way that is consistently to its own benefit. For thousands of years, this species has acted in a manner that can only be described as both sadistic and masochistic, and on a planetary scale. It has not acted intelligently.

At the same time, there is no decision to change, because the vast majority of the human species don't even realize that we have a choice to do that. They don't realize that we have the choice live intelligently. They don't even know or what that would entail.

My protests to the "powers above" are consistently related to this central fact: "I know there's a choice, you know there's a choice, but the general population on this planet has no clue that there's a choice. We can choose to live in a completely abundant and pollution-free environment. We can make that choice and have more abundance, and not less abundance. We can stop spending money for fuel. The capital expenditure for fuel could be completely eliminated. That would free up trillions of dollars annually, globally, from the world budget, from the planetary budget."

If you want to know why I got involved in this technology, it's because we have a way to generate almost boundless levels of electrical power without any pollution or fuel, without even the need for solar panels or wind power.

It's ridiculous that I am installing solar panels in my home, when I have spent the last 23 years of my life in the field of ZP Fluctuation Technology research and development and have one more than one occasion successfully demonstrated it along with colleagues who have also learned the same hard lessons that I have.

Adams: Can we still restore this planet?

Trombly: We can if we act with great clarity and great speed. No obstacle could stand in our path.

We could even reclaim the Sahara Desert. It didn't used to be a desert. It was destroyed by people who cut down the forest and overgrazed the grasslands that were once there. Now the same thing is happening in Brazil, Indonesia, China and South East Asia.

These forests and grasslands are like your skin. What does the skin do? It keeps us from becoming dehydrated. When a person gets third-degree burns, one of the leading causes of death is dehydration. The same thing is true of the forests and grasslands.

It's about maintaining that tissue and understanding that it is very vulnerable. These membranes are being taken away.

We can also reclaim the desert that is forming in the northeastern corner of Brazil, where there was rainforest a hundred years ago. The Brazilian desert exists because the Brazilian people won't stop cutting down their own trees. I say this very bluntly. If the Brazilian people want to demonstrate that they have some intelligence, then they'll stop cutting down the rainforest, which is the equatorial life support of our planet.

If the United Nations and if the American government want to demonstrate their intelligence, then they will suggest that we should give credits to these countries for their oxygen production.

We can reclaim the deserts by these new technologies, by taking the water out of the oceans and using it on the desert.

Where you run into the logjam, over and over with all these issues, is the question of energy.

How can we heal the ozone layer? It's going to take a tremendous amount of energy to do that. We have to replenish the oxygen that's not getting into the stratosphere.

One of the fundamental points that I try to make is about chlorine. It is a molecular demon once it gets into the ozone layer. One chlorine ion can interfere with the production of 100,000 molecules of ozone. So we have to eliminate as much free chlorine and bromine as possible.

But even if we entirely eliminated chlorine and bromine production, that would still not be enough to heal the stratospheric ozone layer.

Another significant cause of ozone depletion, one that is often overlooked, is the reduction in the amount of oxygen that should be transported into the stratosphere over the equatorial rainforests. Project Earth has been trying to educate people to this fact since the mid-eighties. The oxygen source has literally been cut off by deforestation. But we can heal that by reintroducing a tremendous amount of oxygen up there, and replanting the forest down here, on Earth.

It will take energy. Lots of it.

Adams: Can you describe how your life has been endangered because of your perspectives on free energy?

Trombly: If I had described my life to you since 1980, it would be a long, long story, and it would sound like a bad spy novel.

I've had a number of attempts on my life through really serious poisonings. My wife has had to revive me and give me CPR.

So we've had a whole nightmare component to our life. But we don't live in a nightmare at all. It's quite the opposite.

However, I must say that it has been almost unimaginable at times.

Once, in 1988, I was visited by a couple of scientists at my home in Colorado. One of them was Bob Dratch, a man who has done a lot of work in creating microwave detection equipment, which is widely used by the Department of Defense.

Basically, I was standing in my office, which was a large room, 27 feet long, and Bob Dratch was shaking change in his pocket, to demonstrate that his very sensitive microwave detector could pick up the signal this jingling generated. The signal would appear on the meter and the printout.

I pointed the horn of the device at Dratch to measure the effect. And then, as I pointed the horn away, I kept my finger on the trigger and happened to point it out the window of my office. To our surprise, the alarm went off on the machine! The red light went on, and the meter peaked.

My office was being microwaved!

I walked into my back yard and found the place where the signals were being broadcast. It was right behind my house, in a little forest, right next to an engineering company that is well known for making satellite antennas.

I clipped the cable to the antenna that was broadcasting microwaves at my house, and I called the FCC in Denver. I said told them that this was illegal, and I wanted it stopped now. I said, "Stop microwaving me." I already had cancer.

Within three weeks, this engineering company was totally gone. I assume they themselves had something to do with the broadcast, or they wouldn't have left so suddenly.

So dozens of people had to relocate to Kansas, or where ever.

But why were they trying to kill this body? We are perplexed at times by the strange modus operandi of this group.

The world is not going around very well right now, because people aren't loving. When people love, they become geniuses. Intelligence isn't about thinking, it's about feeling. I don't care how many times the force of darkness, which resists love, has attacked you and made you feel separate.

I don't care how difficult anyone's life has been. I guarantee you, I can match it. But suffering is finite, it's limited, it's not eternal. You can transcend suffering through love.

The resurrection we are called to is our resurrection. Once Jesus stood in front of Lazarus' tomb, and commanded, "Lazarus, come out." And we are told that Lazarus came out.

That is similar to what is happening right now. Surrounding this planet, there is a gathering which is inviting the human species into a new dimension. They are saying, "Lazarus come out, come out of your subjective tomb and out of your corruption. Come out of your doubt of God and out of your doubt of Love. In the midst of Infinity and Eternity, We command you."

Now, in this moment, we must come out and ask for help. When we can ask for help, we get it.

People don't understand that you become realized by incarnating love. We live only as expressions of love, in eternity. The only thing that is eternal is Love. Love as the presence of consciousness is eternal and infinite.

Time and space are subsets of eternity and infinity. Space and time are subjective states, and they have nothing to do with limiting the ultimate reality of consciousness, not even a little bit. They have to do with the gnarled subjective states of the contracted world.

Scientists talk about the accelerating expansion of the universe, but it's not that, it's the unremitting *transformation* of the universe that's happening, the inescapable transformation of the universe.

You don't have a choice about it this time. It isn't the same as it was two thousand years ago. We are in the midst of the time of the resurrection. It involves you and me and everyone on this planet, I don't care who they are.

There will be miracles everywhere. The most powerful thing is love. The whole astrophysical community is now acknowledging this power, but they call it the "dark energy." They give it this Darth Vader quality, because they don't know how to relate to the Light. It is the contraction of form and the denial of the Infinite Divine that causes the appearance of darkness.

Adams: How long has there been a conspiracy to prevent the development of free energy?

Well, if you are referring to the technological side of things, I guess you could say it started with Nikola Tesla. (Although the crucifixion was really an attempt to stop Free energy as well.)

Nikola Tesla was given the vision of infinite electrical power, without fuel, in the 1880s. He demonstrated it in 1886 and 1889, and then throughout the 1890s. He tried to give this gift, but the fossil fuel boys decided he couldn't give it. The fossil fuel boys decided that maybe they could make use of him, so they didn't kill him right away. They killed Tesla in 1943.

One of the detectives approached me in 1981, at a conference. This man told me that Tesla had been murdered. So I guess you could say that it all began right there. When I was a kid in school, nobody knew about Tesla. Tesla was the father of alternating current electricity. Tesla said he was inspired by aliens, beings from other dimensions. He was anathematized because he refused to kowtow; he refused to attend the same temple that the others worshipped in.

Adams: How can we make free energy available to the planet?

Trombly: There is no such thing as free energy without enlightenment and liberation. The technologies point to free energy. We are the technology. We are the free energy.

Great yogis like Sri Babaji demonstrate this. Yogananda talked about him. He was the physical demonstration of free energy. He was the physical demonstration of what the Tibetans called the Rainbow Body. He was transparent and transfigured in God realization, the realization of the Buddha Nature.

There are alien cultures and cultures in other universes who happen to be attentive to the events on this planet because this is one of the last archetypal moments. This will not continue anymore. This entire kind of universe is obsolete and will not occur again, because it would be masochism and sadism to allow it to be perpetuated.

There's a transformation that is occurring. It is about the liberation of all the energy that has been bound up in all of these worlds that are subject to corruption. That is the real physics. This is what is really important.

In the meantime, by understanding that this is true, we can tap into a field that we call Zero Point Vacuum Fluctuation or the quantum ether, and we can generate electrical power. Electrical power exists in complete abundance, without any capital cost for fuel.

Solar technology is so very expensive. We have 108 solar panels in our two facilities on Maui and it takes up a great deal of space. I would love to have ZP Technology here, but the fact of the matter is, if I had that working right now, this place would become a target.

The other side of this story is always the same thing. Just when Light appears on this planet, the subjective forces of darkness manifest with great tenacity. This government was overthrown and nobody knows anything about it. People are silent about it.

On the cover of *Newsweek,* on September 11, was an article about the secret vote that made Bush president. The article was about a conspiracy in the Supreme Court. *Newsweek* at that time was willing to challenge the Supreme Court. The Executive Branch of the United States government was about to fall, because it was going to be exposed.

But then the planes hit the World Trade Center.

If Al Gore had been elected, I know the man well enough to know that we would have been in a different economy after four years. We would've begun to implement these technologies.

The United States government has, right now, the technology to eliminate the energy crisis. This consoling gesture that George Bush made the other day, about developing hydrogen fuel-cell technology, is just a carrot that he's dangling before the American people.

Now there are military people who have come forward and are talking about the presence of aliens and alien technology on this planet. They are even talking about the fact that we are making our own flying saucers. This Disclosure Project is extremely important for people to know about (see Secrets from the Stars elsewhere in this issue).

We could be having the greatest economic boom in the history of history. We could actually do that. The technology exists. As early as the 1970s, Henry Kissinger, George Bush, Richard Nixon — all kinds of these guys — knew about this physics. But the downside is that we are on the brink of oblivion.

Parents are paying all this money to educate their children into the lie of physics instead of the truth of physics. Meanwhile, they are taking Prozac. We have legalized the anesthetization of our species. Depression is appropriate.

Adams: What is the purpose of your organization, Project Earth.

Trombly: The original foundation of Project Earth was to reveal to the human species the actual condition of our planet. We're not being told the truth about it. For the most part, the scientific community doesn't know the truth and has been so disempowered by their so-called education that they've lost vision.

Vision is the only thing that will save us. You have to be able to see where you're going.

The agreement that I made with the Divine is one that Bucky and I talked about. We would never just illuminate the problem, we would always offer a solution. If we talked about an energy crisis, we would talk about only it in the context of the fact that there is no energy crisis.

Electrical power is already abundantly available, pollution free. We like electricity. We can power our cars and flying saucers with infinite electrical power. We could have so much fun that living on earth wouldn't be a drag, but would be really great.

Your eyes would be so open that you would walk out the door and you wouldn't see the smog in Los Angeles, but you'd see the clear, sacred air.

Project Earth is not just about communicating the problems. It's about the transformation of humanity.

(End of interview transcript)

Adam Trombly, Director of Project Earth, is an internationally acknowledged expert in the fields of physics, atmospheric dynamics, geophysics, rotating and resonating electromagnetic systems, and environmental global modeling.

Taking the advice of his friend and mentor R. Buckminster Fuller, Adam has maintained a "synergistic, global view" within a multi-disciplinary scientific background. From this perspective, Adam offers unique insights into the changes humankind has effected on our environment, and the adjustments our future requires of us.

For further information about Project Earth, please visit ProjectEarth.com.

Trombly and Celeste Adams spoke on January 21, 2002.

Adam Trombly (Speech): Climate Change Factors, Ozone Layer Crisis, and Zero Point Energy Technologies

(Transcript, slightly edited from http://www.repp.org/discussion/green-power/200205/msg00011.html, of Adam Trombly's speech to the 1988 International Tesla Society Symposium, Colorado Springs, Colorado. Trombly provides additional details regarding Tesla's murder by painful poisoning, likely by the U.S. Government. It is reprinted in its entirety because I believe Trombly's message concerning energy in 2007 is even more urgent and troubling. Gary Vesperman)

As this is the last speech of the conference here, I'm going to give an overview of the development of zero point theory and I'm going to try and take into account all of you have been very patient...

The basic principle which we are obviously here to address, was originally elaborated by Nikola Tesla. The sense that Nikola Tesla conveyed of existence was, if not unique, then certainly it was profoundly inspired, not so much by initial analysis but by initial vision.

We have become a rather left brain biased society, an analytically biased society. As a result of this analytical bias we tend to refute or deny the validity of intuitive jumps or intuitive leaps and insight.

Tesla was an extraordinarily prolific inventor obviously, but in addition to being a prolific inventor, he explored very thoroughly, for his time, the dimension of the psyche. And I think that perhaps too often we tend to forget that he himself claimed that the source of his inspiration was not conventional.

He saw what he built, and then he described it to a draftsman, and built it. The draftsman was his interface with substance. To consider that when he was riding in his carriage or his Pierce Arrow here in Colorado Springs, not too far from where we are right now, he would often see devices in their totality, spontaneously.... is quite remarkable. (I myself have seen descriptions with drawings of some of Tesla's complicated machines. Genuinely amazing! Gary Vesperman)

When you see something in its totality, it tends to have a different meaning than if you tried to put the pieces of the universe back together to arrive at a conclusion. Tesla insisted that he rested in the conclusion in his own psyche. I think this is very important. Tesla was not an analytical apologist; he was not somebody who made gestures to the scientific community to make himself necessarily acceptable in his time. What was acceptable was that he produced. The means by which he produced were often unacceptable, especially in the last couple of decades.

Therefore, we heard a lot about Thomas Edison, and we heard a lot in our education about just about everybody else except Nikola Tesla. The reason I'm sure this Society exists is this left a vacuum, a huge vacuum that is not merely filled by the acknowledgment of Nikola Tesla, but by the acknowledgment of the function of a human being, the function of a being not being polarized to the left hemisphere, but balanced to the two hemispheres of the brain, in other words vision coupled with analysis.

In the development of our generator, which we originally called the "Acyclic Closed Magnetic Generator," vision was implicitly necessary to arrive at our conclusions. Basically we had to work from very little information. There were very few explorers in the field, and we had to begin to consider that perhaps the way we considered reality actually is fundamentally incorrect, that fundamental cornerstones such as the law of induction, for example, that particular cornerstone was not necessarily as we believed it to be.

What stimulated me, and I've said this before, since 1980, was the recognition that certain astrophysical phenomena express energies in excess of what the apparent input is. This is a very common thing in astrophysics, whether you're talking about quasi-stellar objects, or whether you're talking about the planet Jupiter.

When we first found out that the planet Jupiter was developing a looped current between itself and the moon Io, Jupiter was called, in a paper published by a Goddard scientist at NASA, a "Homopolar generator."

They tried to rationalize that the relative motion between the moon Io and Jupiter was actually responsible for the current that we could measure by virtue of its magnetic flux tube as tested by satellite probe. But when you went through some very simple calculations, you found that was not true.

So we decided that we would look into the matter of "Homopolar" generation itself – the history, who came up with it, as Bruce DePalma and others have pointed out. Even though Michael Faraday did an experiment on December 26th, 1831, in which he co-rotated a magnet with a copper disk and measured a current output. Even though he had done that experiment, his own law of induction tended to ignore that fact.

A professor with the Royal Society in London, a professor of science history, told me that the original Faraday cage was designed not to keep electromagnetic noise out, but to keep Michael in. You see he played with a substance we call mercury, and in those days there was very little appreciation for the toxicity of mercury. And so Faraday apparently suffered from a form of dementia, which we've heard very little about because it's one of the cornerstones of the building we have been living in, in science.

We found out after we found Faraday's diary, after we found the citations of the experiments that he had done, that there was a gentleman by the name of Bruce DePalma in Santa Barbara, California, who had suggested that on the basis of the co-rotation of a magnet and a conductor, which we were at that time contemplating ourselves, it might be possible to generate more energy out from the generator than input in.

I must say that my initial response to that was probably not as skeptical as some people might be when they heard such a thing, because in the fields of astronomy and astrophysics it is not uncommon, not uncommon at all to find an object that is obviously exceeding what we "know" to be its thermonuclear, or any other form, it's exceeding the output that it could possibly have by thermonuclear means, by fusion, by fission, by anything we normally consider.

And so, because we had seen that already in space there was this planet Jupiter clearly being a demonstration of what we initially considered to be an anomaly. Clearly putting out three times as much energy as it could possibly be receiving from the sun. We decided to reduce to practice a form of generator with the intention of practical commercial use, and through various good fortunes we arrived at funding.

We actually, for this field in those days, got substantial funding. And as a result of that work, we applied for a patent in 1980 which was, as many of you know, denied by the U.S. Patent Office as being implausible to the extreme. The statement was to the effect that, "This device could not even generate electricity." It wasn't that it couldn't generate electricity in excess of input, it was that the machine couldn't generate electricity at all. The patent officer himself was, as many of us, as all of us basically were unfamiliar, he being totally unfamiliar, with the fact that you could co-rotate a magnet with a copper disc, even though we had provided him with a copy of a page from Faraday's diary. He actually suggested that the diary notes might have been something created expo factos.

My initial naiveté in entering this field was rapidly destroyed.

We felt that if we could produce a practical, commercial, viable unit, then the world would be very excited indeed. And what we discovered instead was we were dealing with a profound level of inertia; inertia in a frame of reference we didn't normally consider.

Economic inertia, intellectual stasis and dogma. Certainly the explorers in this field, over time, whether it's myself, or Bruce DePalma, or Tewari or going back to Moray, Tesla, Hubble. These people all discovered this inertia. It is an astonishing thing when you first encounter it. It is irrational. It says that no, indeed the Earth is the center and everything revolves around it. And the moons around Jupiter couldn't possibly be doing that what you say.

Galileo wasn't vindicated by the Catholic Church until 1984. If we took that many centuries to acknowledge zero point vacuum fluctuation-based technologies, we will all be dead. And that's the sobering realization that I have come to over the last five years.

Buckminster Fuller was a huge influence in my life. I met him when I was sixteen years old and largely because of his influence I wasn't permanently lost in space; lost in the theoretical level of things. And therefore, when I began to encounter this resistance he said something that was very important to me. He said that every new idea, every new technology, every major breakthrough, has an inevitable period of gestation. He said you must learn to be patient. He had experienced profound resistance, as you may know, to various ideas that he had in the thirties.

I think that what we are really seeing is not the resistance or inertia imposed upon this technology, but instead a resistance to a fundamental shift in perception about the Universe itself.

We have tended to describe ourselves in discrete terms, as encapsulated beings, with rather defined boundary layers, both temporally and spatially.

We're born and we die. The boundaries of our body are the boundaries of our being. Inspiration has a difficult time entering into a closed bottle. Where would it come from? Where would it appear?

How could Nikola Tesla say he got ideas from space? He was considered a very eccentric and crazy man as a result of his statements. People point out that he always had all these napkins piled up next to his plate. But by the end of his life, people had forgotten that his vision is what is powering these lights. And if we had continued with his vision, we wouldn't have a fossil fuel economy today. And J.P. Morgan and Rockefeller and a number of other individuals would not have amassed extraordinary fortunes on the basis of that fossil fuel economy.

I think this is extremely important for us to understand because when Nikola Tesla's vision was denied, a part of our own vision was denied. Just as when Galileo's vision was denied. The fact of the matter is that as we sit or stand here, a field of energy pervades us. This even relatively conventional physicists like John Archibald Wheeler stated in a 1962 article in the Review of Modern Physics. "Energy has a mass equivalence of ten to the ninety-fourth power grams per centimeter." You just need to look in the literature. That ninety-fourth power grams per cubic centimeter represents a rather coherent state. It represents something that we could very easily call a continuum.

But because of the taboo against the idea that you might perhaps be able to get water from the well of space, or what people call "perpetual motion", there has not been a sense of any kind of practical application.

Once in a seminar, well over a decade ago, I asked a question I found was extraordinarily taboo, and I said, "Why can't we tap into this field?" It had been established in the literature in Europe by Philip Sipolan (sp?) since 1951 and 1952, that not only did the fluctuation field exist, a fluctuation field of extraordinary energy equivalence. And that the vacuum field was bias able; that it was polarizable.

The polarizablity of a vacuum, fluctuation background, I believe is the essential issue, and a very simple issue indeed that we need to really consider.

David Deutch in 1982 explored briefly in a book called "General Relativity," on Einstein's centenary, which was edited by Hawking, considered very briefly the fact that not only is the vacuum polarizable in terms of density, but that an ideal theoretical situation density polarization could asymmetrically approach infinite density and asymmetrically approach negative energy density. That means that within the vacuum fluctuation itself, stress can be created. That means that the vortical dynamic that Tewari speaks of is really not that difficult to imagine, because you have fluctuation density that wishes to remain isotropic, or uniformly distributed, disrupted, polarized, in a curved manifold, and that vacuum density once polarized wants to relax from that stress back into a more isotropic state.

Anybody who studies vortical physics, fluid dynamics, plasma dynamics knows that there is no greater stress than that by which we invoke a vortical momentum. And therefore it is not hard to imagine, if we simply consider the fact that we are dealing with a medium of this extraordinary density. It is not hard to imagine or even begin to feel that just by simply biasing this field in a rotating cylinder or perhaps in an oscillating circuit, by biasing this field correctly, we can precipitate vortical momentum.

Now we may only precipitate a quasi-electron. In the vacuum fluctuation of space, their production is occurring all the time. In a bias environment however, where an electrical potential exists, that quasi-electron, instead of annihilating with its anti-particle, might indeed be distracted along the potential and find its way into what we refer to very blithely as manifestation.

It doesn't necessarily take giga-electron-volts for this to occur. And that's why Tewari, DePalma, myself and others speak of the generation of power from space.

We need to very simply and seriously consider that it's already in the literature. It isn't just in the literature of the fringe; It's in the literature now even of Physical Review since 1975. Review of Modern Physics, since 1962. And in the European literature since the 1950's. It's a remarkable thing that because of the bias against so-called "perpetual motion", or so-called, "free energy", that nobody seems to want to extrapolate what is implicitly obvious.

The atom itself can then be seen as a dynamic modification of field space. Only a dynamic modification of field space, with no quality of stasis what so ever.

Harold Putoff, in his May 15th, 1987 article in Physical Review, pointed out that in order for the hydrogen atom in its ground state not to collapse, it had to be absorbing energy from the fluctuation background. In this moment. This is not something that happened at T equals zero – before the Big Bang.

This is something happening at this moment, real time present context, now with every atom and molecule that we see configured before us. It is happening right now.

It is wonderful to have Dr. Puthoff describe this energy in terms of the Bohr atom. It is implicit that the electron orbit dissipates energy. If we consider that to be a resonant shell with no locatable density bias, then it still pertains because the atom itself, even in its ground state, resonates in space.

We have a picture, that we got when we were young, that says a thing is solid, even though particle physicists are telling us that nothing is solid, and while that's all very fascinating on Nova television, we still have a picture that persists. Can an atom, existing in certain states of polarization and stress, perhaps become a conduit drawing upon the energy of space? A transducer in a certain light.

Obviously it must be, or else it couldn't exist. The electron itself must be spontaneously appearing out of the background field. If it was not spontaneously persisting then we have to invoke the somewhat Neanderthal concept that everything had to start at a certain moment. And because we have embraced this new cosmology of the Big Bang in the last couple of decades, we have some real problems.

This is not the best forum to go into this in great detail, but I will say this - the Universe is clumpy. That's a term that is used frequently in astrophysics to describe the fact that mass is not uniformly or isotropically distributed. It is simply not. On a large-scale basis with models that have assimilated data from observatories from all over the world, especially over the last few years, we have seen that the Universe we observe is indeed clumpy. It is in fact concentrated in a way that cannot be the artifact of a Big Bang.

Now that's a bold statement. Alfven (Swiss Nobel Laureate), famous for Alfven waves, has come up with an extraordinarily beautiful description of the plasma dynamics of space. And so far, interesting to note, although he was considered to be a complete heretic when he came out with his theory, every single observation we have made from space with satellite probes, has confirmed his predictions. I think it very important that everybody here who is interested in the reality in which we adhere, become familiar with either the esoteric or the exoteric level of Alfven's work. It's just beginning to appear in the literature. I think Discover magazine had a rather prosaic presentation of it, but it was also quite good. (June '88; the "Big Bang Never Happened.")

If there was not a Big Bang, where things conveniently began with a single event, then we need to begin to consider the fact that something that has a gram equivalence of about a gram per cubic centimeter, which is our body, must be a rather insignificant modification of a field that has a potential of ten to the ninety-fourth power/grams per cubic centimeter.

This impacts the way in which we live together; it impacts the way in which we live with the Earth itself.

I had not initially planned today to show some slides from the NASA program, but because this is a cap speech at the end of the day, I feel that it might be very useful to digress for a moment and observe the rather catastrophic impact that the very concept of discrete encapsulation has had upon human existence and the Earth itself.

And I would suggest to you, after considerable study of the subject, which is now becoming accepted in the lterature worldwide, that we cannot sustain the dynamic of human existence any longer unless we begin to transcend the arbitrary, subjective boundaries that we presume to be true. Whether these boundaries are about ourselves, or all phenomena of manifest existence, until we begin to move beyond this anal-retentive state, in which everything must be particularized. Everything being particularized, leaves Humpty Dumpty.

We will never be able to re-assemble existence.

As Fuller pointed out to me at an early age, "existence is already implicitly whole, we break it into parts only in our minds only."

It is already unified whether or not we have a unified field theory or not. And as Einstein suggested at his last series of lectures at the Advanced Institute at Princeton, "perhaps we can only appreciate the unified field by entering a conscious relationship with it."

Again, this is something that would not have been at all contrary to what Nikola Tesla proposed, and yet some people would be embarrassed to say it.

I think we need to very succinctly consider that we cannot continue to burn fossil fuels on this planet, and that we really haven't found anything to do with our nuclear waste.

And that the appearance of bona-fide third party confirmation of the generation of energy from space is a significant event in history. It's not significant because it will make a few men popular, or unpopular. It's not significant because it will somehow create a minor change in our concept of being. It's significant because it represents a dramatic shift that we desperately need to embrace.

Right now we are sitting at the edge of an unprecedented human catastrophe on this planet. A friend of mine, Sayed Sayed (sp?), at Texas A&M who has for twenty years been a climatologist, in an elegant experiment recently carried out in Antarctica, has shown clearly that if we lose between 6% and 7% more of the remaining stratospheric ozone the phytoplankton in the oceans will die.

The phytoplankton in our oceans contribute 50% of the oxygen that we enjoy on this planet. It is extremely important to point out that prior to the appearance of photosynthesizing biomass; oxygen was a trace gas which basically appeared through the natural transitions of H_2O.

We simply cannot afford to lose any more oxygen than we already have. At this moment, literally hundreds of millions of internal combustion engines are running. A six-cylinder engine, of normal displacement, consumes eight hundred thousand (800,000) cubic centimeters of oxygen per hour. This transforms the breathable oxygen into combustion by-products, an entire spectrum of combustion products.

In the last twenty years, in Africa alone, we have destroyed 64% of the biomass ground cover. In the last twenty years! This is a United Nations Environmental Program figure, confirmed by satellite and manned space flight telemetry. (Remember that Trombly gave this speech in 1988. Perhaps these gloomy figures and reports are likely to be even worse now in 2007? Gary Vesperman)

Also, in the last twenty years we have consumed 29% of the photosynthesizing ground cover in Central and South America. In the last twenty years! You cannot consume oxygen at the same time you consume the factories that metabolize carbon dioxide and return oxygen to us, and expect to have a sustainable environment. Because as oxygen tensions decrease even a few percent in the troposphere, ozone tensions decrease disproportionately. This is because there is a column of oxygen and other gases that rises from the biosphere to the troposphere and then to the stratosphere. It is on the basis of the mixture of these gases, that we have ozone in the atmosphere.

I would suggest that we can not afford to wait to demand that serious money is applied to this research, Federal money. We need this to happen desperately and we need this to happen immediately. And for those of us who feel that we can be blasé, and wait and wait and wait until somehow this becomes acceptable, (the implementation of this new kind of technology) let me just say that if we think we can wait; we're sorely deluded.

You wonder why there is a drought in Ethiopia. You hear in Time magazine that the so-called scientists can't figure out why there is a drought. Well, Ethiopia at the beginning of the century was covered by 43% forest. Ethiopia today is covered by less than 4% forest. How is the hydraulic cycle supposed to maintain itself?

This at first, this entire consideration at first, seemed to be in rather left field of the consideration of energy generation. But, as I began to explore it further and further and lectured around the world, I began to discover that most of the human race has been entirely uninformed. Some people have suggested this is rather conspiratorial. The slides you are going to see in just a minute have been available, some of them, for several years. We finally got a few of them on CNN December 25th (1987?)

I think when you see them you're going to realize why they are so significant. And as always I would like to thank Richard Underwood of NASA, now retired, for providing these images. They are in the public domain, but anyone who has tried to get photographic data from the NASA space flight program, especially during the Reagan Administration, will find that it is a very difficult thing to do. As a matter of fact, most of the infrared photography is now stored at AMES, and you can't get into the building. Even though this material is not classified, the building itself is off limits.

I would like to have the lights dimmed, and I would like to show these slides and then we can go on from there. We can discuss in more detail about this and other things.

This is the way clouds are supposed to look over the rain forest. These are healthy clouds. These clouds are appearing over the Northern Congo area and this photograph was taken in the mid-seventies from Skylab. Cumulonimbus, stratocumulus, very beautiful cloud formations and an extraordinary density of water vapor as you can see.

Next slide. This is what the ground looks like after you get rid of the forest. This picture isn't from Africa, it's from Brazil; but literally millions of hectares worldwide look like this today. You can see that the watershed to this river, which is the Sao Paulo River, has been almost totally devastated. You can see that evaporation would occur rather rapidly instead of in a moderated sense through the membrane canopy of the forest.

The next slide shows the way clouds look after you do this. By the way, this is the same coordinate almost exactly, taken from the Space Shuttle in 1984, as the slides show big billowy beautiful clouds from Skylab ten years earlier. What you see beneath this cloudbank is now desert. So the cloud building is no longer healthy. Instead of that nice kind of veil of water vapor, you see an extraordinary, Los Angeles scale, optical density. That's dust.

Dust that has been lifted and aerosolized and now remains in chronic suspension over much of the African continent. The clouds are flat. The convective, humid currents that rose from the rain forest no longer carry water vapor in significant quantities.

(At the end of the above "Charles N. Pogue: 200+ MPG Carburetor" suppression case, this writer, Gary Vesperman, mentioned that he had taken an introduction to meteorology class given by University of Wisconsin-Madison climatology professor Dr. Reid Bryson. One memorable lesson was a study Bryson had conducted of why the Harappan Empire of ancient India had failed. Due to over-grazing by sheep and goats, the Harappan Empire's land had become barren. Each drop of rain is comprised of enough water vapor coalescing around a single dust particle that it becomes heavy enough to fall.

Bryson discovered that increasing dust in the air can reach a critical point where there are so many dust nuclei per unit volume that none of the drops of water can become heavy enough to fall as rain. A feedback cycle then starts up where lack of rain causes even more dust to be stirred up into the atmosphere. More dust causes even less rain to develop.

Bryson's suggested simple solution? Stop goats and sheep from over-grazing the land so as to allow the land to re-vegetate and keep down the dust. The feedback cycle then reverses itself – causing more and more rain to fall.

Currently the American southwestern states are enduring the worst drought in many decades. Are they about to suffer the same fate as the Harappan Empire?)

There was a great effort, a joint effort of the United Nations and several other countries to seed what clouds remain to see if the hydraulic cycle could be restored. Unfortunately somebody forgot to plant anything under the seeded clouds, so the desert is now growing. The Sahara desert is now growing six miles per year and is three thousand miles across. This is significant.

Next slide please. This is to give you an idea of the scale. We are not looking at the desert floor here. We are looking at a pall of dust that stretches as far as the eye can see, to the curvature of the Earth. Twenty-five maybe twenty-eight thousand square miles here. This area all used to be called the sub-Sahara and now is moving into the Sahara. Flat clouds, no rain.

The next slide will show you conclusively that when you see breaks in the pattern, you have a deeper understanding of the optical density. This density is equivalent to a critical day in Los Angeles. This again is chronic and has serious ramifications for us on this continent. Serious ramifications.

This has happened because somebody denied vision. This has happened because when in 1906 Nikola Tesla said that fossil fuels would one day create a corruption in the entire atmosphere of the Earth, he was called eccentric. Next slide please.

South of the aridification process, in Zaire we have fires. These fires are burning out of control. They have no planes to drop chemicals on the fires. They have no fire departments. They have no money. This is a small area, only a hundred by a hundred miles. You can see where the forest that was once there has already been stripped away, and the hydraulic cycle therefore undermined.

The next picture is Angola burning. The CIA did not win the war in Angola; fire did. 13,000,000 acres burned in 1985. When NASA scientists examined this photograph, they thought that this was some sort of strange cloud until they realized it was the combination of the plumes of smoke from the fires. Just consider the area involved, and consider the fact that this is now being visited on our country.

Alaska in the last three weeks has lost 750,000 acres to fire. The Secretary of the Interior, Hodel, said, “Let Nature take its course.” They saved part of Yellowstone that was close to Old Faithful, but decided that the rest of the wildlife habitat was expendable.

And this while we are spending hundreds of millions of dollars producing neutron bombs and other clean kill weapons, which can never be used and God forbid that they ever should be.

The next slide please. This is Junguoy (sp?) Bay on the coast of Madagascar, and it is not uncharacteristic of bays all over the world now. This is what happens after the deforestation and after the fires. This bay was over six hundred feet deep twenty years ago. Now you can walk across it during the dry season it is so filled with silt. This is happening now, today. It is not theoretical. We have to move now.

Next slide please. This beautiful lake was called Chad. Lake Chad was the size of Lake Erie. Lake Chad supported 1.8 million human beings in peripheral agriculture and fisheries. The next slide is Lake Chad in 1982. (In his movie, An Inconvenient Truth, I remember Al Gore showed possibly this very same pair of satellite photos of Lake Chad in central Africa. For an alarming update on Africa’s huge lakes, see http://news.yahoo.com/s/ap/20061209/ap_on_sc/warmer_world_african_lakes. Gary Vesperman)

It’s the hole that was left when the hydrological cycle was destroyed in Africa. This is not a cyclical drought, and it is not a drought that will be only visited on Africa. The water vapor distribution on this planet is being changed dramatically by the destruction of biomass.

The water vapor budget on this planet is being changed dramatically because we have failed to feel beyond our own little subjective event horizons. We tend to exist like psychic black holes. We take a lot and give too little.

A few years ago I pointed out at the fourth International conference on Atmospheric that the drought of 1986 and 1988 would occur. Now they have occurred. They are not going to cease because we don’t want them to occur. They are not going to cease until we realize that we need to mobilize every democracy on this planet, and hopefully this will someday soon include the Soviet Union, to implement this new class of technologies.

We can address these issues by planting forests and by using energy generated by these new technologies. Whether you call it an "N" machine or something else, I'm sure these technologies will continue to evolve.

By utilizing this energy which we can get directly from the "vacuum" of space, we can desalinate and re-irrigate. The Israelis if nothing else have shown us that you can resurrect a desert. We are going to need to resurrect a planet. We cannot posture ourselves and say that national security comes before the security of the human race. It is the security of the human race in total that is now threatened.

This is the last slide. I'm only going to show eleven slides today. I think they speak for themselves. This is a veil of dust that stretches out towards the horizon across the Atlantic Ocean, reaching from the Caribbean Sea, in the lower portion, all the way to the African coast. This is not a phenomenon that occurred in one year. This is a phenomenon that occurs every year – between eight and nine million square kilometers this year. (8-9,000,000 square miles)

This dust acts as condensation nuclei for water vapor causing precipitation in the south, over water, in Honduras, in Nicaragua, while the Midwest and Southeast are parched.

We are changing the way things work, and we haven't even begun to inspect the ramifications. It isn't just the "Greenhouse Effect"; it's a much more complex issue.

Only by stepping over the threshold into a more synergistic view, which is not just a kind of convenient term bandied about for the sake of the "New Age," but only by entering into a more synergistic view which acknowledges the inherent coherence of phenomena, can we begin to comprehend the fact that when you do something here it affects something over there. In quantum geometrodynamics, actually in a number of other studies, what we call action at a distance, in a coherent field, distance is not presumed.

I hope that this all has said something. Fuller's suggestion was that Project Earth should either determine whether there was a reason why we had to implement these technologies, or whether it was no big deal.

"Can we last longer? – I need to get my next grant from DuPont." To produce more chlorofluorocarbons? "Yes, it does seem that it might have that effect, but if I say that in the literature than I am defying my contract."

Scientific integrity, which used to be something that characterized science, is something that is sadly lacking in too much of the scientific community. Too many have become grant whores and parasitic on society, posturing themselves as authorities, condemned to the inertia of the past and past conceptualizations of reality.

Recently I was lecturing at John Hopkins, which is in itself sort of a miracle, about zero point physics and while we were considering zero point physics somebody said, "Well this is all well and good that Mister Tewari did this over in India, and that it's all well and good that you've done this in the United States. DePalma, it's all well and good to demonstrate it, but what about the United States Government?"

"I mean wouldn't the United States Government be doing something?" the child asked. A sixty-two year old child, a very nice man actually. And I said all you need to do is get a hold of the 1986 fiscal year "Request for Proposals" published by the Department of Defense.

Look on page 193 of that document, and you will see something very interesting. In AF section, which is Air Force section 86-77 subsection 6, you will see that a government which denies the reality of zero point technologies is requesting .... "further research into esoteric energies heretofore unknown including the zero point dynamic fluctuations of Space." ... for propulsion. But it doesn't exist you see...

But we want you to research it if you have a bona fide organization that happens to be a prime contractor with triple security clearance. This for propulsion for the Air Force when the entire human race is threatened. Now there is a certain kind of insanity somewhere implicit in that. It's in the literature; you can order a copy from Project Earth, or call the Pentagon. This is not a classified document. I won't get in trouble for saying anything. This is actually a program that is ongoing, right now, today, within the government enclave. Call Los Alamos and ask a question about it, and you might get a very long silence on the other end. Call Lawrence Livermore Laboratories and their Aberdeen Testing grounds. The same phenomenon will probably occur.

A significant amount of funding is going to make sure that this irrelevant, mythical phenomena is applied to weapons systems and weapons-carrying systems. Something is very wrong about that. I don't believe that anybody sitting in this room would say that it's in the best interest of our people, or any people of the world, for this kind of technology to be applied outside the realm of civilian application at such a time.

Six to seven percent further depletion in stratospheric ozone, and we are seeing depletion rate trends that indicate that this level of loss will occur very easily within the next two decades. Those of us who have really considered this, and as you consider it more and more I'm sure you'll realize that two decades pass very quickly, for all of us. It doesn't give us time, as I said before for subjectivity.

This field has survived, but not on the basis of being acceptable in the literature. Tewari has tried to publish. I know the IEEE (International Electrical and Electronic Engineers) is involved in this conference, but Tewari tried to publish in IEEE and was summarily rejected. Many of us have tried to publish and have been rejected. The reason Tewari even bothered to try to duplicate this "Acyclic Closed Magnetic Generator," after years of correspondence with DePalma, was because he was able to convince some mechanical engineers that it had some engineering method. You see they actually did material stress analysis.

We also analyzed. We used beryllium copper for a reason. It's just engineering. There are a lot of you in this room who are perfectly capable of doing it. There was nothing magical. We just operated on a different presumption. We said, "Maybe this experiment will work." And if it doesn't work, well then it's like 88% of the rest of them. If it does work, heh, then there is another level of confirmation.

Robert Kinchloe, Professor Emeritus of Stanford University, went to visit the, how can we call it, encumbered "Sunburst Machine". This machine was originally developed by DePalma, Richardson and Bernard at Sunburst Farms, Santa Barbara, California. Dr. Kinchloe just out of curiosity of his own mind, decided that he would just see if there was something about it that was unusual. He presented a paper on it, and I understand that it only got to Bruce through somebody else. But that's not unusual; my own attorney has directed my attention to an article I never knew existed. It's funny about that.

It's funny when representatives from our own Government look me straight in the eye and say, "Yes we know this is real, but we wonder why you would disclose it to foreign nations?"

I said, "I didn't disclose it to foreign nations. It was in an international publication in 1982, and I didn't even know about it."

I would suggest to you that it's time for us to not simply entertain a curiosity. I would suggest to you that it's time for us to enter a human process of inter-relationship, to try to attempt to reintegrate ourselves with one another and not in a floaty kind of "new age" sense necessarily at all. Just call ten people and ask them to each call ten people and tell them that we have an emergency on our hands. Demand that the people we are hiring represent us, supposedly, not the major corporations. We are hiring these people to represent US! Which one of you has the power to lobby in Washington?

We need to send a very clear message to Washington that states, "Gee, don't you think it's silly to be talking about Star Wars? We're only talking about Global Genocide." This without doing anything except for what we are doing right now. We don't have to drop a bomb or fight a war. Just continue exactly as we are now. All we have to do is remain in this collective state of inertia. And I don't personally believe we are going to do that. I don't believe that human beings are not going to rise to this occasion. I don't believe it for a second.

But, I do believe we need first to understand what we are confronted with. And then we need to understand that we can do something about it. We need to act, and we need to act like somebody who is being chased by a hot poker, or someone who cares.

Whichever your response is, Act!

Ten people calling ten people calling ten people, covers the country in a week. It's called "Exponential Networking." I didn't come up with the idea; Fuller did. Call ten people. Ask them to call ten people and find out what happens. It's the equivalence of an electron avalanche in human society. It works.

So, I wanted to try to give a wrap-up and I wanted to cite the fact that we wouldn't be here if it weren't for somebody's vision. Yes, their vision was applied. Yes, their vision, his vision, Nikola Tesla's vision was brought into life. Otherwise he would have been a mere mystic, wouldn't he?

Yes, we do have to sit down with our Macintoshes, or sit with our Hewlet Packard 41C calculators. We had a lot of money (for this field). A total between the two phases of the experiment of about $200,000. And now I'm finally happy to say it looks like it's going to be produced, or at least this one is going to be produced. It looks like DePalma is also moving into that modality.

We are certainly hoping that more people will come out of the woodworks and say, "Hey, well I've had this thing for the last thirty years. But I was told that if I brought it out into the public when I was working at Los Alamos twenty years ago, they would basically permit character assassination to ensue."

It's hard to believe in some ways, and I don't want to paint a black picture, but I think we have to see the end of times when the New York Times calls a National Center of Atmospheric Research scientist to ask, "How come everyone in the world says that the Reagen report on acid rain is a lie?" And the man answers, "You don't understand the kind of pressure we're under here. People's careers are in jeopardy." This when all our lives are at stake.

So I would like to open the floor to questions....

".....I raised a question in another seminar about the oxygen depletion, and the speaker told me that even if we were to kill all the forests at once it would take a very long time for the oxygen to dissipate out of the atmosphere....

We are talking about a change in the mixture of gases, okay? There are people who say that even if you combusted all the carbon on the Earth, biomass and post-biomass, the oil reserves, everything, there would still 75% of the oxygen in the atmosphere. Unfortunately, they fail to take certain things into account. For example:

Today we sit, and if you knew what we went through to get this acknowledged in the world press (And it would take me an hour to tell you), but we now have it publicly acknowledged by NASA that we have between a 2.3% and 6.6% depletion in world wide atmospheric ozone depending on latitude and time of year. This not taking into account the rather large depression over Antarctica.

When this level of ozone depletion occurs, the level of ultra-violet influx increases the probability of photosynthesis in the lower atmosphere. So, the O_2 is preferentially converted into H_2O_3 for example. This would normally only appear in great quantities after a lighting storm in the past.

We have a lot of H_2O_3 in the atmosphere. We have a lot of O_3 in the troposphere, which until very recently was being attributed to internal combustion. But O_3 was appearing in large quantities in rural areas where there was very little internal combustion, relatively speaking. It became an embarrassment when the Department of Agriculture had to admit that 2.6 billion dollars worth of crops were being destroyed per year by ozone alone.

So the photosynthetic reaction that is occurring as the result of increased ultra-violet influx must be taken into account if we are going to begin to understand what is going to be sustainable in terms of oxygen tensions. It is the mixture of gases that rise from the biosphere through the troposphere and into the stratosphere that determines the tension of ozone, O_3.

The Nimbus satellite, by the way which NASA has conveniently said is out of calibration even though it was in fine calibration last September, and in almost perfect agreement with the instrumentation on the ground in Antarctica. Which by the way at the center of the Antarctic hole, six miles up, we had 96% depletion levels last year (1987). The jumpsuits worn by some of my friends from the Center for Atmospheric Research, please understand there are a lot of good people there, people there I respect a lot, their nylon jumpsuits were actually degraded by ultra-violet exposure in just one flight. Several people had serious eye injuries.

Now anybody who is going to suggest that this type of influx is not going to effect the species of molecules that we have in the atmosphere, and the mixture of those gases, is denying an extremely important fact. So whereas I'm not suggesting we're all going to die of anoxia, what's going to happen when the phytoplankton in the oceans die? They are the basis of the entire oceanic food chain. If you are not familiar with them, they are the little critters that actually made all this possible. This conference would not be occurring today without their sponsorship.

I think we need to realize that we are sponsored by living things, and we need to support them so they can support us. Does that answer your question?

Yes, thanks.

It occurs to me that the resurrection of Nikola Tesla's vision and other people who have had the vision of the quantum ether, may yet be called on for a second offering. I think it's a good time to invest in this second offering of free energy. We did not invest the last time and now we are paying for it. I don't want to see anybody suffer. What will it be like in ten years, when already the American Cancer Society says that even with sunscreen protection ratings of 15 SPF, direct sun exposure should be limited to an hour?

I hope the Tesla Society will prosper, and move into a new age of manufacturing, implementation and further development. I want what has happened so far to be totally obsolete in ten years. One kilowatt in your pocket, why not?

There is absolutely no reason why not. You've got ten to the ninety-fourth power, grams per cubic centimeter energy equivalent field. It's not in a great big area, but it's a Lot of energy. If we can just scrape the surface, ever so slightly, we would never have to worry about it again.

That's what Nikola Tesla was scheduled to tell Franklin Delanor Roosevelt back in 1943. In 1943 he had proposed to FDR that perhaps we should look carefully at the fact that we can get all the energy we need from any space we happen to be in.

He didn't show up for his meeting with the president. He was found dead in his apartment, "Natural causes."

There is some suspicion that maybe his visionary paranoia of poisoning was not exactly paranoia, ... but premonition.

I have never mentioned this before, but when I spoke at the 1981 Conference at the University of Toronto, a detective, an older gentleman from New York, with a heavy New York accent, approached me afterwards and said that he was a detective at the time when Tesla had been found dead, and said he was involved with the investigation.

He said, for national security reasons, that nobody was to know that the coroner's report had indicated he had been poisoned.

I have never personally read the coroner's report, but the man was about the right age. He showed me a badge, and I had no reason to doubt this man who had come all the way up to Toronto from New York, just to tell somebody after all those years.

The coroner's report did say he had been poisoned. Now it turns out that the only medium to my knowledge it actually cites that Tesla had been poisoned is the Yugoslavian film on Nikola Tesla called, "The Secret of Nikola Tesla." So everybody can watch again the introduction, because they say it right at the beginning. And they also say perhaps that he was killed by the Nazis.

I did not really want to mention all this, but science cannot exist in an environment where science is not allowed to grow.

Any other questions? Well, you have all been a tremendously patient group. Thank you for your attention.

Thank you Adam.

Em-Tech Technologies: Advanced Solar Photo-Voltaic Crystal Lattice Cells

In 1989, during another flight of the Space Shuttle Atlantis, the U.S. military photographed a newly launched Soviet communications satellite in geo-synchronous orbit above Moscow. There were several things about the new Soviet satellite which were unusual. First, spectroscopic investigation of the signature of the satellite revealed the familiar tell-tale presence of nuclear material located in the aft section of the satellite. It was presumed (incorrectly, it later turned out) that this signature confirmed that the satellite was, indeed, powered by a small on-board thermo-nuclear reactor.

What did not make sense, though, was the fact that the power requirements, which American military analysts believed were needed to support the variety of functions being performed by the Soviet satellite, were believed to consume considerably more power than could possibly be produced by a nuclear reactor of the kind and size believed to be installed and operating on the satellite.

Further, the photographs revealed the presence of a peculiar kind of parabolic dish suspended from the nose of the satellite. It was shaped like the much larger satellite receiving dishes commonly used by television viewers in the West. The peculiar thing about this dish was that it was very small, less than three feet in diameter, and had a very flat parabolic surface. This meant that it did not focus the signals they presumed it received onto any boom-mounted collector or decoder device. No such device was mounted on or attached to the dish.

Finally, it appeared to be constructed of a material or combination of materials which was unknown at the time, but which appeared to be highly reflective, almost like a mirror. Interestingly enough, the dish was also apparently transparent to interstellar signals which originated behind it. For years it was believed that the strange parabolic device was a special kind of high-gain directional antenna. That assumption later proved to be totally false.

In fact, information recently supplied by the I.N. Frantsevich Institute for Problems of Materials Science (IPMS), Kiev, Ukraine, to support several of its patent applications confirms that the dish was constructed of the same crystalline lattice material which is used to construct the interior of exceptional energy storage devices, but built with some very special features. The purpose of the device was to convert sunlight and other ambient wavelengths of energy into ion flow or electrical current, in sufficient amounts to maintain the electronic and other operational functions of the satellite. In the West we refer to devices which act this way as photo-voltaic devices or solar cells. The device which looked like a high-gain antenna dish was certainly a solar cell, but it was much more than that.

The quantum physics and the new technologies which made it possible to produce the crystalline lattice structure of the energy storage devices also made it possible to produce a similar crystalline structure which was capable of simultaneously converting wavelengths of widely varying characteristics into ionic flow or electrical current. The strategy employed by this revolutionary new material worked across almost the entire spectrum of known wave lengths, from far out in the realm of extra-low frequency long wave lengths propagated by the original Big Bang all the way up through the visible light spectrum and beyond, into X-rays and ultra-high frequency, ultra-short wavelength wave forms associated with pulsars, quasars and quantum singularities.

The quantum mechanics which describe the characteristics of the crystalline lattice structure recognize two distinct features of wave/particle propagation which are nowhere integrated in the linear quantum mechanics or solar cell technologies of the West. First, the characteristic of crystals which differentiates them from all other known material substances is that they resonate (or oscillate, to be more precise) at both primary and harmonic frequencies.

A crystal-based tuning fork which resonates at “A” natural will also resonate in sympathy with any harmonic of “A” natural propagated across the entire wave spectrum if the wave form is detectable and of sufficient intensity to activate the crystalline structure of the tuning fork.

The crystalline lattice of the Soviet solar cell was deliberately designed and constructed to resonate at all the harmonic frequencies of the entire wave length spectrum, as defined by six discrete bands which embrace all known wavelengths. These bands are each a harmonic of the next, and all of them cause excitation (oscillation) of the crystalline lattice structure at the same time.

This phenomenon reflects a new feature of quantum mechanics, instantaneous simultaneity of crystalline oscillation regardless of the distance of separation. The potential of this phenomenon in future applications is truly awesome. Properly harnessed, for example, this property of crystal structures as defined by the IPMS version of quantum mechanics could make it possible to communicate over vast distances with no time lag. The oscillation characteristics demonstrated by these structures operate outside the normal context of space-time.

This writer, Gary Vesperman, happens to be the inventor of a major advance in torsion field communications, made possible by these special crystalline lattice structures. The maximum theoretical capacity of torsion field communications apparently is 40 billion channels of three-dimensional holographic television through the entire earth without attenuation at one billion times the speed of light.

It has long been recognized in the West that oscillating crystal structures can be engineered to create a usable flow of ions in the form of low-voltage direct electrical current. However, instead of relying exclusively on light in the visible spectrum alone to create ion flow, the Soviet system operates on all known ambient wave lengths simultaneously, in six harmonic resonant bands. It creates ion flow wherever and whenever such wave forms are present. It means that these devices operate on ambient heat remaining in a room or in the dead of night when there is no visible light present at all.

One more feature distinguishes the Soviet material from the Western photo-voltaic or solar cell. The Western cell operates by trapping photons of light in a cleverly designed network of glass, mirrors and other inter-connected reflective materials which are deposited on a substrate of a dielectric material. When the volume of "photon" traffic striking the dielectric material reaches a minimal threshold, electrical current is created.

That is, when enough photons have been captured to excite the surface of the substrate by either directly impacting molecules on the substrate surface or by creating heat energy sufficient to cause those molecules to oscillate, ion flow is induced. It is not a particularly efficient method, but it is the best that has been devised in the West.

In the Soviet material, because photons are known to behave in precisely the same manner as electrons, the photons (which are present in all wave forms, including visible light) are simply introduced to the energy wells between the tips of the molecular pyramids on the sheets of crystal lattice which overlay each other. The material is so efficiently designed that it actually absorbs (here is another place where imprecise common language gets us into technical difficulty) the individual photons in the same way it accommodates electrons.

During the discharge cycle, when a circuit is open and available, the photons simply follow the path of least resistance, which is out through the crystalline lattice and into an electrical circuit, energy storage device, or some other similar application.

The Soviet solar panel operates at a nominal efficiency of no less than 51% in the least consistent pieces which have been tested in the United States. The best pieces have produced test results demonstrating operating efficiencies in excess of 80%. These devices/materials produce electrical current at a higher rate per unit of exposed surface area in the dark of night than the best solar panel ever produced in the West will generate in the most ideal sunlight conditions.

The simple circular device attached to the Soviet satellite was a single solar cell which was used to power the entire ship and all its functions. The nuclear fuel signature detected by the Atlantis crew was nothing more than the emissions produced by a piece of spent nuclear fuel placed on board the satellite, intended to mislead the American surveillance team. It worked.

Advanced solar photo-voltaic cells produced by Em-Tech Technologies of Toronto, Canada, have demonstrated actual hands-on efficiencies in laboratory applications of more than 50%. These cells are based on designs developed by the IPMS. Theoretical models have yielded energy production efficiencies of more than 80%. These cells operate on such wide band-widths and at such high efficiency rates that their performance characteristics in the dark of night exceed those demonstrated in broad daylight by the best current, state-of-the-art solar cells produced anywhere else in the world. When applied to current global electric energy requirements for domestic, commercial, industrial and military use, the cost of electricity could be reduced to less than $.002 per kilowatt hour, with the added capability of operating not only in daylight but at reduced loads throughout the night, regardless of weather, on virtually any scale.

(When I, Gary Vesperman, was peripherally involved with the IPMS inventions during the 1992-1994 period by way of preparing Rodger Ward's electric car IPO, I heard a cute story. Ashurst Technology Corporation was based in Las Vegas, Nevada, where I was also working. Ashurst wanted to bring some of the IPMS scientists to Las Vegas and set up laboratories. The scientists, who were used to the much colder climate of Kiev, Ukraine, balked at moving into the hot desert. Toronto, Canada was chosen as a compromise location for Em-Tech Technologies.)

For comparison, the very best solar cells ever produced in the West have been produced by the Japanese. These cells operate at a maximum of 19% efficiency. That is, they convert as much as 19% of the ambient visible sunlight shining on a clear, cloudless day into ion flow, which then becomes low-voltage direct electrical current flowing through a circuit. The Japanese panels require months per section to manufacture and literally cost more than their weight in gold to manufacture. They are very heavy and are so sensitive to vibration and calibration that once installed, they cannot be moved at all.

Joint ventures of the IPMS with more than a dozen private sector companies to develop these useful inventions have been repeatedly sabotaged by the U.S. Government's Defense Intelligence Agency and others. (Source: David G. Yurth, *The Anthropos Files: Tales of Quantum Physics from Another World – 2nd Edition*, 2007)

David G. Yurth emailed to Gary Vesperman on August 5, 2007 his own suppression story:

When I was hired in the Spring of 1992 by Ashurst Technology Corp, whose offices were then located on Western Avenue in Las Vegas, I was assigned the task of understanding everything there was to know about the new sciences and technologies developed by the I.N. Frantsevic Institute For Problems of Materials Science between 1945 and 1991, when the Berlin Wall came down. The owners of Ashurst had accidentally hooked up with three top scientists from the Institute, as reported in the publisher's proposal I submitted to my agent in the Spring of 1994. (Yurth's proposal comprised the original edition of *The Anthropos Files: Tales of Quantum Physics from Another World*. "Anthropos" is a Greek word meaning 'of man' or 'things related to humans'. Yurth used it in the title to his book about IPMS technologies because it occurred to him that their epic scientific and technological achievements offer everything needed to save Planet Earth from what we humans have been doing to it.)

My publisher's proposal was released by my agent to former Secretary of Defense Frank Carlucci at a luncheon they both attended at the Washington Press Club two weeks after I gave her my manuscript. Two weeks later, two guys in dark suits and thin black ties came into my office and attempted to confiscate my computer and all my records. I called the police, had them arrested and then was forced by the Director of the Western Regional Office of the Defense Intelligence Agency to forego publishing the book for five years under threat of prosecution and personal injury. When you read the treatment, you will understand why it was important. That was a major league suppression exercise, the scope of which you will come to appreciate after you have read my manuscript. They are still successfully suppressing many of the technologies that are cited in that piece of work. (Some of them are described elsewhere in this compilation of energy invention suppression cases.)

However, the most important scientific technology suppression story, in my estimation, is the successful squelching of the report issued to Discover Magazine by the CDF Collaboration at Chicago's FermiLabs, citing the discovery and verification of sub-quarks as the constituents of quarks. I reported this information in my still unpublished book manuscript *Seeing Past The Edge* in considerable detail, including copies of the press releases and report abstracts issued by the more than 450 signatories to the report when it was issued. (This writer, Gary Vesperman, edited *Seeing Past the Edge*.)

If ever there was a significant suppression of essential, baseline scientific information, this was it. What it means to science, and what is suggests about the sufficiency of the Standard Physical Model is one thing. But what it says about the extent to which the gatekeepers for the scientific establishment are willing to go to suppress information that threatens their stranglehold on their own territorial imperatives is another matter entirely. If I were to choose between all the instances I know of scientific or technological suppression during the past century, this would have to be number one on my list, bar none.

Dave

Like energy inventors, physicists occasionally also encounter suppression. See http://rense.com/general77/21.htm.

Marshall Douglass Smith (Author): The Rise of Fascism in the American Energy Business

The ruthless geo-political strategy of corporate American energy oppression is clearly exposed by Marshall Douglass Smith in his book *Black Gold Hot Gold –The Rise of Fascism in the American Energy Business*. The book details the collusion of oil companies and the US military and federal government since the 1920s. A preview of Chapter 3 is available online at http://www.theforbiddenknowledge.com/hardtruth/black_gold_3.htm, and is recommended reading.

To be fair, an experienced oil and gas geologist, a friend of Gary Vesperman, thinks Smith's account is false of how the end of the Vietnam War was intentionally delayed until the very day that Standard Oil had completed its exploration of oil offshore of Vietnam.

And what do you suppose is really happening with Iraq and Iran? The *Los Angeles Times* article "It's Still About Oil in Iraq" (8 December 2006) -- see http://www.truthout.org/docs_2006/120906Y.shtml -- affords us some clues. The U.K. *Independent* article "How the West will make a killing on Iraqi oil riches" (http://news.independent.co.uk/world/middle_east/article2132569.ece, 7 January 2007), and Truthout's "New Oil Law Means Victory in Iraq for Bush" (http://www.truthout.org/docs_2006/010807A.shtml) confirm the suspicion of what many people think is the real reason why the United States invaded Iraq.

Perhaps the key to peace in Iraq would be to share Iraq's oil dividends among the Iraqi people, in the same manner that Alaska shares oil dividends (see http://www.iraqdividend.com). Instead, the American and British oil companies, in collusion with Bush administration, are planning to keep the lion's share. Realizing the real purpose of the U.S. invasion and reconstruction of Iraq, Iraq's oil workers unions are struggling to prevent the handover of ownership of Iraq's oil to foreign oil companies (see http://www.truthout.org/docs_2006/060907A.shtml).

To order a video about the US warning to the Taliban in August 2001 to allow an oil pipeline through Afghanistan --- or bombs would start dropping in October 2001 --- visit http://www.nutech2000.com/category1_1.htm.

It is logical to assume that the real reason for both Gulf Wars, and the interim between the two wars which featured US Navy patrols of Iraq, was to allow major American oil companies to use explosions from US Navy bombs – for well over a decade – to seismically explore for oil in the Persian Gulf off Iraq's shore, at nearly no expense to themselves, just like Standard Oil did during the Vietnam war.

Is it now time to explore for oil in the Persian Gulf off Iran's shore? But first the oil companies have to secretly stampede the United States and Iran into a very long war with each other…

CONCLUSION

It should now be evident that the oil/auto and power monopolies viciously defend their global energy markets by threatening, persecuting or even murdering targeted energy inventors, and even entire nations.

U.S. Patent Office Holds Secret 5000 Patents

The most straightforward way to suppress development of new sources of energy and still maintain an appearance of legitimacy might be by controlling the United States Patent Office.

Under the Invention Secrecy Act of 1951, the government may restrict the publication and dissemination of information about new inventions if their disclosure could be "detrimental to the national security." At the end of fiscal year 2006, there were 4942 invention secrecy orders in effect. These "secretized" patents are kept in the vault at the U.S. Patent Office (Park 5 Building). They never receive a patent number, and the inventor is rarely, if ever, compensated by the government for use of the invention. (Source: http://www.fas.org/blog/secrecy/2006/12/patent secrecy orders_lifted_o.html. Other patent secrecy links: http://www.fas.org/sgp/othergov/invention/admin.html, http://www.fas.org/sgp/othergov/invention/37cfr5.html, www.fas.org/sgp/othergov/invention/australia.pdf, http://www.fas.org/spp/starwars/, http://www.fas.org/blog/secrecy/2006/12/patent_secrecy_orders_lifted_o.html, http://www.fas.org/blog/secrecy/2006/12/navy_mind_control.html, and www.fas.org/sgp/othergov/invention/program.html.)

The U.S. Patent Office has a nine-member committee that screens patents in order to protect "national security".

An understandable reason for suppressing certain types of energy inventions is that the knowledge behind them is also capable of producing tremendously destructive advanced electromagnetic weapons such as the "death ray" apparently invented by Nikola Tesla and the Russian military's deployment of plasma beam weapons. Hence many such new energy technologies, particularly those using this kind of knowledge of advanced electromagnetic principles, are considered "dual use" technologies that are among the 5000 un-numbered patent applications confiscated in a vault at the U.S. Patent and Trademark Office because of their military potential and the need to keep that knowledge from America's enemies.

A hidden purpose of this committee is to also find and remove from public access energy-related patents which could threaten the fossil fuel and power monopolies.

Canada's patent office doesn't have a similar screening committee. It is recommended that energy patents possibly in danger of being classified should be first applied for in Canada. Once granted, up to one year is allowed to apply for the same patent in the U.S. Patent Office. Now the patent can not be classified because it is already out in the public domain, courtesy of Canada.

Text of Generic Patent Secrecy Order

SECRECY ORDER
(Title 35, United States Code (1952), sections 181-188)

NOTICE: To the applicant above named, his heirs, and any and all of his assignees, attorneys and agents, hereinafter designated principals:

You are hereby notified that your application as above identified has been found to contain subject matter, the unauthorized disclosure of which might be detrimental to the national security, and you are ordered in nowise to publish or disclose the invention or any material information with respect thereto, including hitherto unpublished details of the subject matter of said application, in any way to any person not cognizant of the invention prior to the date of the order, including any employee of the principals, but to keep the same secret except by written consent first obtained of the Commissioner of Patents, under the penalties of 35 U.S.C. (1952) 182, 186.

Any other application already filed or hereafter filed which contains any significant part of the subject matter of the above identified application falls within the scope of this order. If such other application does not stand under a security order, it and the common subject matter should be brought to the attention of the Security Group, Licensing and Review, Patent Office.

If, prior to the issuance of the secrecy order, any significant part of the subject matter has been revealed to any person, the principals shall promptly inform such person of the secrecy order and the penalties for improper disclosure. However, if such part of the subject matter was disclosed to any person in a foreign country or foreign national in the U.S., the principals shall not inform such person of the secrecy order, but instead shall promptly furnish to the Commissioner of Patents the following information to the extent not already furnished: date of disclosure; name and address of the disclosee; identification of such part; and any authorization by a U.S. government agency to export such part. If the subject matter is included in any foreign patent application, or patent, this should be identified. The principals shall comply with any related instructions of the Commissioner.

This order should not be construed in any way to mean that the Government has adopted or contemplates adoption of the alleged invention disclosed in this application; nor is it any indication of the value of such invention.

(The harsh punishment for a violation of this secrecy order, should an inventor exploits or even simply discusses his or her invention which is classified by a patent secrecy order, is 20 years in federal prison. In effect the U.S. Government brutally and suddenly orders unlucky energy inventors to keep absolutely quiet and not do any more work on their inventions – without compensation for their well-meaning efforts. Thus a shocked, intellectually shackled and frustrated inventor would end up losing everything he or she had invested in his or her invention. The public is also ruthlessly denied any benefits from the invention.)

US Congress: Energy Inventor Protection and Patent Declassification Act

The newly elected United States Congress should immediately write, introduce, and pass a bill titled, "Energy Inventor Protection and Energy Patent Declassification Act of 2007". Included should be 24/7 protection of energy inventors and their property by armed guards, and declassification of as many as 5000 energy patents unfairly held in secret by the U.S. Patent Office. (In spite of what one email correspondent suggests is the appearance of appointing a fox to guard the henhouse.)

Remy Chevalier suggests that the U.S. Congress needs to put back into question the entire review process of patent law, and its consequences on environmental health, by imposing strict fines to who ever is caught buying energy patents for the sole purpose of keeping its protocol out of commercial circulation.

In this fourth version of Gary Vesperman's compilation of specific energy invention suppression cases, the body count rose to a disgusting high of as many as 17 innocent people who were brutally murdered just to ensure the global market supremacy of giant energy monopolies. 31 energy inventors and associates are known to have been threatened with death, and 5 energy researchers and associates have been imprisoned or falsely charged.

The Congressional bill should also include a provision to hunt down and imprison for many years the secret government/corporate energy invention suppressors and their hired bullies and assassins.

The U.S. Congress in 2005 gave the oil companies $2.6 billion in tax breaks as a reward for $190 million in campaign contributions. (Source: League of Conservation Voters)

Wilhelm Reich: Orgone Energy Motor

In the mid 1930s Wilhelm Reich, MD, began noticing an energetic connection that is shared by all living beings and had the clarity of mind to not dismiss the observation as unimportant. Dr. Reich called this energy "orgone" and worked for decades demonstrating its laws and studying its various manifestations.

Dr. Reich in 1948 got a "synchro" type of electrical spinner motor to run from both an orgone energy accumulator and an orgone-charged high-vacuum tube. James DeMeo and Nicholas Reiter have each written an article on the orgone energy motor construction and use, with eyewitness quotes and many construction details. DeMeo has also published a third article on the subject of electrostatic motors, which are powered by sources bearing some resemblance to what Reich used in conjunction with the orgone accumulator.

An assistant, either suspected to be secretly working for the U.S. Government or was simply an incompetent and thief, had helped with its mathematics and construction. This assistant then took some of Reich's money and the motor with him that winter on the pretense of working on further refinements. Instead he disappeared. None of his claims about his past including previous employment were verifiable.

The U.S. Government then campaigned for many years to thoroughly ban and burn Reich's books and any other printed literature that included the word "orgone". U.S. Government violations at the time included the warrant-less invasions and searches of the homes of people peripherally associated with Reich. In one such case, a home was searched, and Reich's books were confiscated from private bookshelves. School teachers and doctors who worked with Reich were fired from their jobs.

Reich died at the age of 60 after serving eight months of a two-year federal prison sentence. Reich had been falsely labeled a quack and a racketeer by the U.S. Government and the corrupt American medical system. (Sources: Emails from James DeMeo, http://www.proliberty.com/observer/20030310.htm, http://www.orgonelab.org/cgi-bin/shop.pl/page=xpulse.htm, http://www.orgonelab.org/cart/xpulse.htm, and http://pw1.netcom.com/~rogermw/Reich/orgone_motors.html.)

Energy invention suppression much too frequently involves energy inventors unjustly being deprived of their constitutional rights. Years ago James DeMeo, Ph.D., wrote a scathing well-referenced article "Anti-Constitutional Activities and Abuse of Police Power by the U.S. Food and Drug Administration and other Federal Agencies" (see http://www.orgonelab.org/fda.htm). The flagrant abuses by the U.S. Government he cites are clearly reflected by U.S. Government-sanctioned energy invention suppression terror tactics. At its end, he lists the pertinent constitutional rights which for over two centuries hundreds of thousands of Americans have defended with their lives as sacred:

The Constitution of the United States Bill of Rights, 15 December 1791

Amendment I: Congress shall make no law ... abridging the freedom of speech, or of the press...

Amendment IV: The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated...

Amendment V: No person shall be ... deprived of life, liberty, or property, without due process of law...

Bruce DePalma (Interview): A Peaceful Revolution against Energy Oppression

A University of California at Santa Barbara 1983 interview by Daily Nexus Staff Writer Evette Justus quoted Bruce DePalma, local physicist and scientist:

"A peaceful revolution can occur providing we can free ourselves from the oppression which is dominating us and controlling our day-to-day existence. This oppression is the necessity to make payments to a system which gives us the energy to heat our homes, transport ourselves, brings our food and fertilizer to grow our food, and makes the plastic that goes into our clothes. When we can be released from that we will have a choice. And this can be the only revolution – a peaceful revolution, and free energy technology makes this peaceful revolution possible." (Quote submitted by David Crockett Williams.)

How to Stop Energy Invention Suppression

Compiling energy invention suppression cases is the most disgusting project this writer, Gary Vesperman, has ever done. All too many times while writing these stories, I have recoiled in dismay at the meanness of the energy invention suppression bullies who for DECADES have conducted their vicious operations paid for by giant lying greedy energy monopolies and their secret allies in the United States Government.

Even if HALF of these suppression cases can somehow be found to be false, the conclusion is still inescapable that we have a very, very serious problem of which very, very few people are even aware.

Hundreds of billions of dollars of energy business are at stake. I can not think of another issue that is more fundamental to American politics than energy invention suppression.

Energy invention suppression indirectly impacts on the largest scale economics, national security, foreign policy, Middle Eastern oil wars, the environment, food production, preservation of beloved parks and wilderness areas, protection of endangered species from extinction, trade balances, climate change, conservation of scarce natural resources, company and personal bank accounts, and the health and safety of ourselves and our loved ones.

The perpetrators of energy invention suppression constitute the world's single most powerful economic force. They are secretly committing acts of high treason for which their leaders should be hunted down and severely punished. The Internet can educate and empower a widespread grassroots revolt against energy invention suppression. To stop paying hundreds of dollars a month of tribute to the energy tyrants as soon as possible, each of us millions of energy consumers must again and again identify and carry out specific organized actions – the combination of which hopefully will culminate in a peaceful overthrow of those traitors, restoration of full constitutional rights to energy inventors, and gaining our rightful energy freedom.

- In each energy activist's immediate geographic area, establish or join an Adopt an Energy Inventor Group to financially support and even physically protect a local energy inventor against harm.
- Petition the U.S. Congress to pass specific legislation against energy invention suppression such as the above suggested “Energy Inventor Protection and Energy Patent Declassification Act of 2007”. One by one, each Congressperson must be closely questioned, monitored and held accountable for his or her actions concerning energy invention suppression. Government and corporate officials as well as Congresspersons who are found to be committing high treason by supporting often vicious energy invention suppression should be hunted down, quickly brought to trial and, if convicted, severely punished.
- Review and modify, where needed, existing federal and state laws and regulations which either intentionally or unintentionally suppress energy inventions. For example, in the suppression case described above of the Fish/Kendig Variable Venturi carburetors, the possibly corrupt California Air Resources Board forced a young college student to remove a Fish/Kendig carburetor from his Mercury “gas hog”, even though it doubled mileage and reduced pollution.
- Educate and persuade local groups, companies, labor union locals, and government agencies to pass resolutions advocating energy invention freedom.

- Monitor energy research web sites such as www.keelynet.com, www.rexresearch.com, www.zpenergy.com, www.nexusmagazine.org, www.pureenergysystems.com, www.orgonelab.org, www.bob-dratch.org, www.teslatech.info, www.byronwine.com, www.commutefaster.com, www.freeenergynews.com, www.padrak.com/ine, www.cheniere.org, http://peswiki.com/index.php/Congress:Member:Leslie_R._Pastor, http://www.atlantisrising.com, http://www.newenergycongress.org, http://peswiki.com/index.php/New_Energy_Congress, http://www.borderlands.com/freeenergy.htm, http://www.lenr-canr.org, www.green-salon.com, http://www.novainstituteoftechnology.com/, http://www.electrifyingtimes.com, and http://www.energysuppression.com.

- Sell or give away millions of "End Energy Invention Suppression Now!" T-shirts, bumper stickers, yard signs, banners, etc.

- Subscribe to and buy back issues of alternative energy research publications such as Fusion Facts, Cold Fusion Times, Nexus, New Energy Times, Infinite Energy, Extraordinary Technology, Journal of New Energy, Borderland Sciences Research Foundation, New Energy News, Electrifying Times, Space Energy Journal, New Energy Movement, German Association for Field Energy, Swiss Association for Free Energy, and Canada's Planetary Association of Clean Energy.

- The mission of http://www.energysuppression.com includes a repository of energy invention suppression cases. Energy freedom activists may post notices relating to putting a stop to energy invention suppression. Energy freedom activists who organize a local "Adopt an Energy Inventor Group" will find resource materials and a place to announce and coordinate their anti-suppression activities.

- http://www.energysuppression.com will enshrine an honor roll of "Warriors for Energy Freedom". These are companies, university student groups, labor union locals, individuals, environmental organizations, and other groups who advocate restoration of full constitutional rights and adequate financial support to inventors of new sources of energy. A description of their actions, which can be as simple as a publicly declared corporate resolution, would accompany their listings. New nominations will be voted in by majority vote of the New Energy Congress.

- http://www.energysuppression.com will display an "Energy Invention Suppression Hall of Shame" listing the names of those who have been clearly identified as perpetrators of energy slavery. New nominations will be voted in by majority vote of the New Energy Congress.

The U.S. Congress and the environmental organizations quibble about raising automobile mileage standards a paltry few miles per gallon. Let's get real! Let's instead now begin this ultimate environmental crusade with millions of bumper stickers, meetings, state legislative resolutions, demonstrations, emails, yard signs, labor union boycotts, T-shirts, energy inventor adoptions, movies, live concerts, crusades, letters and phone calls to the U.S. Congress, web sites, television documentaries, sit-ins, college lectures, protests, and banners in the streets and on vehicles blowing in the wind…

End Energy Invention Suppression Now!

DISCLAIMER: Inclusion of any invention or technology described in this compilation of energy invention suppression cases does not in any way imply its suitability for investment of any kind. All investors contemplating any investments in these devices and technologies should first consult with a licensed financial professional. Prospective investors should exhaustively perform their own investigation of pertinent facts and allegations of facts. Investors should also ensure thorough compliance with regulations of the federal Securities and Exchange Commission and appropriate state securities divisions. For more information, see http://www.zpenergy.com/modules.php?name=News&file=article&sid=1655.

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September 3, 2007

Thank you for your comment, Gary Vesperman.

The comment tracking number that has been assigned to your comment is SEDDsupp20011.

Comment Date: December 1, 2011 19:54:15PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20011

First Name: Gary
Middle Initial:
Last Name: Vesperman
Organization:
Address: 588 Lake Huron Lane
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Address 3:
City: Boulder City
State: NV
Zip: 890051018
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Energy Invention Suppression Cases September 3 2007.doc

Comment Submitted:

Attached is my compilation of 95 energy inventions that have been suppressed by the U.S. Government and others. Pages 12-13 have this:

Gerald Schaflander: Solar-Produced Hydrogen Turned into Liquid Hy-Fuel

During the 1970s Gerald Schaflander, with the Solar Electric Power Corporation of Culver City, California, and with financial help from some friends, built a pilot production facility in Menlo Park, California. Schaflander had developed gallium aluminum arsenide/gallium arsenide solar cells and was producing hydrogen with the cells' output, which was then chemically turned into a liquid fuel called Hy-Fuel. The fuel could be utilized in cars or trucks. It was not used as a liquid but as hydrogen gas, by cracking it and feeding the recovered hydrogen gas through a special carburetor.

Schaflander and his scientists had found from their own experiments that silicon will not work. It deteriorates in the desert heat and becomes only about 2 percent efficient. Having found silicon cells unsatisfactory, Schaflander's scientific team perfected gallium aluminum arsenide/gallium arsenide solar cells. They also found a way to produce such cells on a semi-automated basis, slashing costs. Some of the photovoltaic cells used to power NASA spacecraft cost as much as $5 a watt to produce; Schaflander's automated process reduces the cost to 27 cents a watt.

The prototype of a commercial Hy-Fuel production facility on 1000 acres of leased land near Yuma, Arizona comprised of two lines of slanted solar panels that gather the sun's rays. Behind them were rounded, cylindrical "parabolic concentrators" that intensify the energy collected by the panels and focus it on photovoltaic cells. The cells produce electrical energy, and electrolysis then splits the hydrogen atoms from water. The hydrogen gas so produced is turned into a stabilized liquid similar to ammonia. The liquid Hy-Fuel is fully substitutable for fuel oil or for gasoline in automobiles, tractors and other vehicles. These are connected by wires and tubing to a small pumping station and rounded storage tanks.

This Yuma solar energy farm was the creation of Consumers Solar Electric Power Corporation of Culver City, California. On July 1, 1980 the firm had its first commercial tank load of 250 gallons of Hy-Fuel ready for delivery at only 50 cents a gallon, and was producing more Hy-Fuel. With an option on leasing another 10,000 acres and given financial support, the facility could be cranked up to full production on the entire 11,000-acre tract in six months. According to Stephen Wright, president of Consumers Solar and its scientific expert, with eight hours of continuous Arizona sunlight a day, such an energy farm would produce 3.8 million gallons of Hy-Fuel a day.

Hy-Fuel production could be increased considerably by substituting Soviet-developed high-efficiency crystal lattice solar photo-voltaic cells (see below).

A unique co-generation system would turn the waste heat produced by the process into low-pressure steam that could be used to drive turbines producing electric power for the utilities. Schaflander estimates
that his company's energy farm could produce electricity at a capital cost of $690 per kilowatt. The capital-cost figures for fossil-fueled and nuclear-powered plants are $1,200 and $1,400 per kilowatt, respectively. Note that these are 1980 figures.

Conversion of present engines to hydrogen fuel can be accomplished in a few hours. The process involves removing the gasoline tank and installing a new tank capable of holding the slightly heavier hydrogen hydride mixture. A “cracker” would be positioned in the front of the car next to the motor to convert the ammonia-like Hy-Fuel into a gas mainly composed of hydrogen. This gas would flow into a new carburetor to which a fuel regulator is attached. Certain other solenoid valves and vacuum and pressure switches would be wired into the car. The hydrogen-powered vehicle would then be ready to roll.

There is no question that Hy-Fuel works. Schaflander had converted eighteen Chevrolet engines to his revolutionary fuel and had driven them across the continent, getting about twenty miles to the gallon. Tests show that Hy-Fuel’s emissions are far cleaner than gasoline, obviating the need for costly emission devices such as catalytic converters which poison roadsides with toxic platinum dust particles. Hy-Fuel is also more stable than gasoline – far less likely to explode in case of an accident.

All this was developed without a dime of federal tax money. In 1978 Schaflander challenged a U.S. House of Representatives Energy Committee to let him test his device on a selected fleet of U.S. Government cars. Although he asked for no up-front money and had promised, “If we can’t deliver, we don’t get paid,” the U.S. Government turned him down.

Schaflander was harassed by oil company-inspired opposition, including telephoned death threats to his 79-year-old mother and quite "official" opposition from the U.S. Postal Service. His company was essentially driven out of business. The whole story is described by a long article that was published in the October 4, 1980 issue of The Nation. There is much detail on the suppression, but little data on the actual process used. (Source: “The Hydrogen Alternative: Somebody Doesn’t Like Hy-Fuel” Fred J. Cook, The Nation, October 4, 1980, pp. 305-311)

(End of excerpt)

This Draft Solar PEIS should precisely and honestly compare the cost-effectiveness of solar-produced hydrogen into liquid "Hy-Fuel" as described above with conventional solar energy collection and transmission methods such as photovoltaic and solar thermal concentrating.

This Draft Solar PEIS should thoroughly and honestly examine the scenario where the U.S. Government reverses its policy of suppressing the above described solar energy utilization method and insteads vigorously develops and commercializes solar produced hydrogen into liquid "Hy-Fuel".

Energy Invention Suppression Cases

Compiled by Gary Vesperman with the help of numerous contributors

Introduction

In their efforts to improve the well-being of their fellow humans, inventors often suffer poverty, slander, and suppression. Inventors of energy devices in particular have been threatened by large energy corporations who are allied with the United States Government and seek to enslave people in subtle ways. The tactics used against energy inventors include "legal" imprisonment on false charges, harassment by the IRS, and outright criminal death threats, beatings, bribery, burglary, vandalism, and arson. At least a few inventors have been murdered if they were not dissuaded by other means.

Sometimes, however, alleged energy inventions actually have been scams, or were tested incorrectly, and their inventors then claimed to be victims of a conspiracy. Many inventors merely have been ignorant of the laws of nature – the history of "perpetual motion machines" provides ample proof of that fact. Many otherwise brilliant inventors have been poor businessmen who signed defective contracts or whose personalities prevented successful negotiations. Some have failed to persevere: it can take decades to bring an invention to the marketplace, and the vicissitudes of life interfered with their plans. Others unfortunately died of natural causes before they achieved success.

Adding to the practical difficulties of pulling out of thin air new energy inventions that have never before been thought of, testing prototypes of some of these energy inventions can be frustrating due to a weird quick of nature. Thomas E. Bearden, Ph.D., reports that certain types of energy inventions interact with their local vacuums. Thus their coefficient of performance can vary from place to place, due to the local vacuums themselves differing. A machine would produce over-unity energy in one location; then inexplicably quit after being moved to another location!

Dr. Bill Tiller, former head of the Materials Science Department of Stanford University, developed a unique detector which required that he "grow" its proper pattern in the local vacuum interaction environment. Experimental results from the detector helped Bearden understand changes in interaction between a local vacuum and a novel machine.

All too many times, however, the conspiracy to suppress new energy inventions has been very real. For energy invention suppression updates, see http://www.energysuppression.com.

<u>Energy Invention Suppression Case Statistics</u>

Number of Energy Invention Suppression Incidents – **95**
Number of Dead, Missing, or Injured Energy Inventors, Activists, and Associates – **20**
Number of Energy Inventors and Associates Threatened with Death – **32**
Number of Energy Researchers and Associates Imprisoned or Falsely Charged – **5**
Number of Incidents of Energy Invention Suppression by the United States Government, Patent Office, Central Intelligence Agency, Federal Bureau of Investigation, U.S. Marshals, Army, Air Force, Navy, Bureau of Alcohol, Tobacco, and Firearms, Defense Intelligence Agency, S.W.A.T. Teams, National Security Agency, U.S. Postal Service, Department of Energy, Department of State, Securities and Exchange Commission, Food and Drug Administration, Department of Defense, Department of Homeland Security, Internal Revenue Service, Rural Electrification Administration, White House, Consumer Product Safety Commission, Small Business Administration, and Canada's Royal Canadian Mounted Police – **59**
Number of Inventions Classified Secret by U.S. Patent Office – **5000**
Number of Incidents Involving Oil Companies – **9**
Names of Companies, Banks, State Agencies, Private Groups, and Universities Involved with Energy Invention Suppression – **Standard Oil, Zapata Petroleum, Atlantic Richfield, Exxon-Mobile, Shell Oil Company, General Electric Company, Yakuza, California Air Resources Board, Organization of Petroleum Exporting Countries, Wells Fargo Bank, Ford Motor Company, General Motors Corporation, Massachusetts Institute of Technology, Queen of England, Kollmorgan, World Bank, Rockefellers, Carlyle Group, and Bush Family**

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Nikola Tesla: Wireless Power and Free Energy from Ambient

Nikola Tesla invented the alternating current electrical system we use today, and dozens of other technologies. Many of his other inventions are fundamental to the modern electrical world. The US Patent Office has 1,200 patents from Tesla, and it is estimated that he could have patented an additional 1,000 or so inventions from memory! Nikola Tesla was undoubtedly one of the greatest scientists who ever lived.

Tesla's "Magnifying Transmitter", built in 1895 at Wardencliff on New York's Long Island, has been suppressed (largely by ignoring and disdaining it), but in recent years it has received new attention for its potential to power civilization with radio-broadcast electricity, possibly even without fuel. The project was financed by John Pierpont Morgan. But Tesla was not an astute business man, and he affected a disdain for money. It is popularly believed that when J.P. Morgan learned that Tesla's system would provide free energy, he stopped funding the work. As reported by Robert Nelson, (see his comprehensive energy inventions web site www.rexresearch.com) the fact of the matter is that, rather than arranging a comprehensive financial agreement for development of the system, Tesla simply dunned Morgan for relatively small sums of money at regular intervals. The personal nature of their financial relationship is evident to anyone who takes the time to read Tesla's correspondence with Morgan (not an easy task, as Tesla's handwriting is difficult to read). For more history, see Leslie R. Pastor's Introduction in http://peswiki.com/index.php/Site:LRP:Motionless_Electromagnetic_Generator. Tesla also built and drove a Pierce-Arrow car during the 1930's which ran on a free energy device without refueling.

Benjamin Fulford in a stunning early July 2007 interview by Jeff Rense (see interview transcript in http://bellaciao.org/en/article.php3?id_article=15376) claimed that his great-grandfather George Taylor Fulford was one of the richest men in the world. He also was the largest stockholder in General Electric. When he learned J.P. Morgan had abruptly backed out of supporting Tesla, Mr. Fulford pressured General Electric to step in. He was going to finance Nikola Tesla, but he was murdered by the Rockefellers in 1905. It was made to look like a car accident. And the family fortune was stolen by the Rockefellers. Benjamin Fulford's grandfather was only three years old at the time. His grandfather didn't know how to suspend his assets.

After Morgan died, his heirs and managers, who did not have a working relationship with Tesla, stopped supporting construction of the transmitter. The tower was demolished during World War II, allegedly because it could serve as a landmark for German submarines. Some modern conspiracy theorists have claimed that it was destroyed in order to suppress the technology. Perhaps so, but in any case, now we suffer with a monstrous grid system that is controlled at many levels, rather than enjoying the energy freedom Tesla had envisioned.

In a speech presented in 1988 on the subject of "Climate Change Factors, Ozone Layer Crisis, and Zero Point Energy Technologies" (see below for complete text) Adam Trombly reported information from a contact that Tesla was poisoned and died in 1943 the night before he was scheduled to go to Washington, DC to meet with President Franklin Delano Roosevelt. Tesla had intended to propose to Roosevelt that perhaps we should look carefully at the fact that we can get all the energy we need from any space we happen to be in. The U.S. Government's Federal Bureau of Investigation confiscated two truckloads of Tesla's written work after his death, much of which remains classified.

Robert Golka: High-Powered Tesla-Type Energy Tower

In 1981 in Wendover, UT, Robert Golka, a well-known Tesla researcher, was victimized by an attack on his workshop which has, for years, been in a deactivated Air Force hanger. His high-powered energy tower outside the hanger was partially destroyed. A witness said insulators and sections of the tower were laying around the base. In the meantime the rent on the Air Force hanger has been raised 1000 percent! These new difficulties now threaten to bring an end to his research with Tesla devices. (Source: http://peswiki.com/energy/Directory:Suppression)

Bruce DePalma: N-1 Homopolar Generator

Harvard-educated Bruce DePalma, who taught physics at the Massachusetts Institute of Technology for 15 years, invented the homopolar electricity generator, also called the "N-Machine", that could provide cheap, inexhaustible, self-sustaining and non-polluting energy. The N-Machine uses principles that flout conventional physics and are still not fully understood. A 100-kilowatt N-1 homopolar generator prototype sat in his garage. It could power his whole house. But DePalma was afraid to turn it on for fear the U.S. Government may confiscate it.

In early November 1980, the night before Bruce DePalma was scheduled to leave for Germany to be the featured presenter at Hans Nieper's Gravity Field Energy Conference in Hanover Germany, DePalma got a phone call from US astronaut Edgar Mitchell claiming "The CIA has information to the effect that if you go to Germany you will not be coming back. And you better watch out what you do there in Santa Barbara, or you might get your head blown off." Mitchell was "best friends with George H.W. Bush" – at that time directing the US Central Intelligence Agency (CIA). DePalma eventually left the USA to live in New Zealand.

BRUCE DePALMA: Free Energy Update 11/14/90. Audio cassette #A1009-90 $9.00.
Live on Something's Happening. Bruce DePalma, inventor of the "N Machine" (so-called "free energy") presents an update on its development including U.S. Navy development, a letter by U.S. astronaut Edgar Mitchell on the validity of the invention, and the forced imprisonment of DePalma's chief backer.

For more information about George H. W. Bush's involvement with the CIA, read the Truthout article "Bush Senior Early CIA Ties Revealed" in http://www.truthout.org/docs_2006/010907P.shtml (9 January 2007). Newly released internal CIA documents assert that the former US President's original oil company, Zapata Petroleum, was established in 1953 by joint efforts with Thomas J. Devine, a CIA staffer.

Devine and Bush visited Saigon early January 1968 shortly before the North Vietnamese launched their Tet offensive. Marshall Douglass Smith in his book *Black Gold Hot Gold –The Rise of Fascism in the American Energy Business* (see below) exposes how the war in Vietnam was not allowed to end until the very day that Standard Oil had completed using the US Navy to explore Vietnam's off-shore oil fields for ten bloody years at nearly no expense to the company. The war was needlessly prolonged by months of silly wrangling over the shape of the Paris peace negotiation table, and by Henry Kissinger's obfuscations.

??????: Mixed Chemical Stone

A mixed chemical stone was found in England and secretized by the Queen. It generated its own electrical sparks. This material appears to be a version of rocks which self-generate voltages such as those researched by John Hutchison, Thomas Henry Moray (see below), and Thomas Townsend Brown. The Queen's holdings are so extensive that it may be that she was not personally involved or even aware of the stone. The Queen may not have very much scientific understanding anyway.

April 7, 2006 Wells Fargo Bank announced they finally invested $5 million of the $1 billion intended for renewable energy. Where did they invest? In a mutual fund: Carlyle/Riverstone Renewable Energy Infrastructure Fund I, Limited Partnership. Funny thing, who are the 3 largest stockholders of Carlyle Group? The answer in order of largest percentage owned: (Source: Al Martin)

1. The Queen of England
2. Bush Family
3. Bin Laden Family

President George W. Bush's brothers Neil and Marvin Bush might be among the secret leaders of ongoing viciously thorough energy invention suppression. See http://www.nogw.com/shadow.html.

Andrija Puharich: Method and Apparatus for Splitting Water Molecules

One of the more interesting research projects in which energy researcher Leslie R. Pastor personally got involved with has been research involving 'water as fuel' dynamics. From the time of Jules Verne to the present 'water as fuel' has been man's quest, if not speculative goal, to discern, decipher and to design. It is well-known that water can be disassociated, and separated into its two components of hydrogen and oxygen. With the use of electrolysis, water is easily disassociated, giving off its properties, in the form of useful gases, but, in very limited quantities, depending upon the amount of current directly used to accomplish its disassociation. From Brown's (Rhodes) gas to 4-space, water is indeed mysterious, ultimately remaining the focus of countless experimenters and practitioners. And still it remains elusive just out of the reach of useful usage. Or has it?

Several recent experiments involving a variety of 'water as fuel' derivatives have ultimately surfaced, strongly indicating that 'hydrogen' based 'energy' structuring is fundamentally possible and will ultimately provide a means at accomplishing a very serious alternative to so-called 'fossil fuel' technologies. What remains to be seen, is whether the existing superstructure involving the monopolistic cartels of "global big oil" and "international nuclear-based companies" will allow any advancement towards 'market' restructuring, without their approval and cooperation.

Oil is just as easily 'cracked' and 'restructured' into 'hydrogen' formats. In fact, it is the goal of both of these factions to ultimately build a network of 'novel' nuclear reactors capable of providing 'electricity' and 'hydrogen' production derived from this combination, precluding any attempt to escape from their monopolistic designs of enforcing their 'control' paradigm.

The suppression of 'water as fuel' technologies invented by small independent inventors, therefore, takes on significance, since this would prevent further monopolistic dominance by the existing cartels, already dominating the existing 'energy' field.

Andrija Puharich (see http://www.andrijapuharich.org/) was granted U.S. Patent No. 4,394,230 for a "Method and Apparatus for Splitting Water Molecules." This method would reportedly split water molecules into hydrogen and oxygen with a net energy gain, and is essentially a perpetual energy device that many believe violates the first law of thermodynamics. Puharich was a very interesting gentleman, with friends in very high places, and led a very dynamic life, incorporating both, style and access, to some of the most powerful components of the political spectrum internationally. Puharich, being a friend of R. J. Reynolds (3rd), found support and protective acceptance, until he fell into disfavor with David Rockefeller, ultimately necessitating him to seek protection from another friend, the [then] Mexican President. Puharich capitulated, acquiescing to Mr. Rockefeller's demands, promising not to engage in further 'water as fuel' research, thereby, stopping all attempts at his sanctioned assassination by the U. S. Government's CIA.

http://www.rexresearch.com/puharich/1puhar.htm
http://waterpoweredcar.com/puharich.html
http://www.zpenergy.com/modules.php?name=News&file=article&sid=1191
http://www.angelfire.com/ak5/energy21/puharich.htm
http://www.keelynet.com/keely/puha1.txt
http://www.wasserauto.de/html/more_cars_.html
http://www.freie-energie.net/index/freie_energie/wasserautos/wasserautos.htm

Pastor mentions Puharich, in his initial introductory statement, because of Puharich's direct relationship within the most significant references of power politics. Puharich was well connected, and respected within the most elite of global society. He was known academically, and internationally among the power elite. He therefore was a significant threat to those special interests involving a direct influence regarding energy sources as fuel derivitives. And his use of 'water as fuel' was a direct threat to one of the most powerful families on planet Earth. Puharich had to personally assure the Rockefeller family that he would no longer engage in further research or usage of 'water as fuel' to power combustion engines. (Source: http://peswiki.com/index.php/Site:LRP:Actual_Case_Histories_of_Suppression_Occurrences)

Neil Schmidt: Hydraulic Wind Turbine

Neil Schmidt stopped in Gary Vesperman's office 12 May 1995 to discuss his invention of a hydraulic wind turbine. Schmidt had lived in Las Vegas for seven years. Nine years previous when he was living in the Seattle area, he went into a federal Small Business Administration office to apply for financial aid. The following day, he received a telephone call and was told it wouldn't work and not to bother with it. He had provided the SBA office hardly more than a sketch so a hot argument erupted which lasted a half hour. The man ended up hinting death to Schmidt if he didn't stop working on his invention. A couple of days later, Schmidt went back to the SBA office and walked around unsuccessfully trying to identify the voice he had heard on the telephone.

Neil Schmidt also has heard that another energy inventor living near his Washington residence had been shot in the head and blinded.

United Nuclear: Hydrogen Fuel System Kit

The United Nuclear Hydrogen Fuel System Kit converts late-model fuel-injected gasoline-powered vehicles to run on hydrogen. In addition to specific complete kits that are planned to soon be available for specific late-model cars and trucks, individual system components will be available for those who choose to assemble their own kits.

Included in the kits (and also available separately) is the company's either solar or wind turbine-powered hydrogen generator that remains in the vehicle owner's garage. The hydrogen generator manufactures the hydrogen fuel for the vehicle at virtually zero cost. Simply put, the vehicle's owner never would have to buy gasoline again. Since there are no major changes made to the engine, a converted vehicle can still run on gasoline at any time.

Powering a vehicle by hydrogen is by no means a new idea, and in fact, almost all automobile manufacturers are currently developing a new generation of vehicles that run on hydrogen as opposed to gasoline. This new generation of vehicles essentially comprises of electric cars that use fuel cell instead of batteries to run the electric motor. Using a chemical process, fuel cells in these new vehicles convert the stored hydrogen on board, and the oxygen in the air, directly into electricity to power their electric motors. These new hydrogen powered electric vehicles are very efficient, and in fact are more efficient than any internal combustion engine. The problem is that these new vehicles are years away from production, are very expensive, and converting to using hydrogen fuel in this manner requires the purchase of a new (and expensive) vehicle. All hydrogen/fuel cell systems currently under development by large manufacturers require the purchase of hydrogen as would be for gasoline.

The United Nuclear Hydrogen Fuel System Kit is an intermediate approach that simply converts existing vehicles to burn hydrogen or gasoline. The stock gasoline fuel injection system remains intact and is not modified in any way. It is shut down while the hydrogen fuel system is activated. The company reportedly operates two test vehicles for which gasoline haven't been bought for two years.

The hydrogen gas is precisely metered into the air intake of the engine while the exhaust gasses are continuously analyzed for correct burn ratio. This allows the driver to switch between running on gasoline or hydrogen at any time. The engine itself is only slightly modified. The conversion makes substantial changes to the computer & electrical system, ignition and cooling systems. Since they never have to be removed, hydrogen fuel storage (hydride tanks) can be installed in virtually any available space within the vehicle.

Due to the fact that hydrogen gas burns so much faster than gasoline, engines with compression ratios greater than 9.5 to 1 are very susceptible to damaging pre-detonation (engine knock). For this reason, hydrogen conversions are not recommended for vehicles with turbochargers, superchargers, or compression ratios greater than 9.5 to 1. Also, because of the higher compression, different ignition system, and host of other factors, the Hydrogen Fuel System will not work on diesel engines.

The company's hydrogen generator produces hydrogen from electricity. The electricity can be common "household current". If the electricity is produced directly from solar power or wind power, the energy cost is zero. Electricity can be produced by Neil Schmidt's hydraulic wind turbine (see above), or by a number of other wind generators such as Number 47 of http://iiic.de/4643.html which is a combined solar/wind electricity generator.

The most productive solar photo-voltaic cell seems to be the Soviet-developed high-efficiency crystal lattice solar photo-voltaic cells described below.

Las Vegas inventor Jeff Prescott invented a method of generating hydrogen by concentrating solar rays to heat pure iron in the presence of water. The iron oxide byproduct can be sold for paint and other uses. Questions remain as to the overall energy efficiency of his process, particularly in regard to refining and transporting the pure iron.

It does, however, take a substantial amount of time to produce sufficient hydrogen to fill even a small tank. As an example, it takes over 2 days of the company's hydrogen generator running at full power, 24 hours a day, to fill its smallest "short range" tank.

The tanks are filled with granulated hydrides which absorb hydrogen like a sponge absorbs water. Hydrogen is pressurized into the material. Hydrides have many advantages over ultra-cold liquid or pressurized gaseous hydrogen. One is that the density of the hydrogen stored in the hydride can be GREATER than that of ultra-cold liquid hydrogen. This translates directly into smaller and fewer storage tanks.

Once the hydride is "charged" with hydrogen, the hydrogen becomes chemically bonded to the chemical. Even opening the tank, or cutting it in half will not release the hydrogen gas. In addition, if incendiary bullets are fired through the tank, the hydride would only smolder like a cigarette. It is in fact, a safer storage system than a gasoline tank.

Then how do you get the hydrogen back out? To release the hydrogen gas from the hydride, it simply needs to be heated. This is either done electrically, using the waste exhaust heat, or using the waste radiator coolant heat.

The company's Hydrogen Fuel System kits heat the hydride tanks electrically. As soon at the hydride is sufficiently warm, hydrogen is released from the tanks, and the on-board computer detects the presence of hydrogen pressure. The fuel system remains in "Hydrogen" mode until the tank pressure begins to drop. If the tanks run out of hydrogen, the engine will seamlessly switch over to gasoline, which enables the car to run conventionally until the hydrogen tanks are refilled at zero cost.

Using hydrogen, the only exhaust products produced are water vapor and a tiny amount of nitrogen oxides. It's about as clean burning as you can get.

United Nuclear's first prototype was a 1994 Chevrolet Corvette that was converted to run on hydrogen. Using the Extended Range kit (2 sets of tanks), the driving range is over 650 miles per fill. As the hydrogen gas is produced using the company-furnished solar-powered hydrogen generator, the resulting fuel cost is near zero.

United Nuclear now has accumulated over 50,000 trouble-free miles on their prototype vehicles. They are currently fleet-testing their systems and are in final preparation for sales to the general public. They will fully guarantee and stand behind all their products and workmanship. Their conversion kits will initially sell for $7,000 to $10,000 each.

United Nuclear has developed every aspect of its Hydrogen Fuel System on their own, using their own funds and not a dime of federal tax money. They do not sell stock, and do not need investors.

Not unexpectedly, the corrupt U.S. Government has swooped in by utilizing its Consumer Product Safety Commission (CPSC) as a means of suppressing the pending commercial sale of United Nuclear's Hydrogen Fuel System Kit by confiscating the necessary chemicals used in this system from public use – possibly basing its action on false premises.

Currently, the CPSC is focusing on common chemical oxidizers such as perchlorate compounds, nitrate compounds, permanganate compounds, chlorate compounds, etc., along with a wide variety of other common chemicals and metals such as sulfur, aluminum, magnesium, titanium, zirconium, zinc, magnailim, benzoate compounds, salicylate compounds, antimony and antimony compounds, etc.

The CPSC now claims that this action is to stop the manufacture by United Nuclear of illegal explosive fireworks. If their true intention is to attempt to curtail the construction of these devices, there are only two chemicals which should be of concern: potassium perchlorate and German aluminum.

For those unfamiliar with exploding fireworks, they are all made from one material: flash powder. Flash powder is a mixture of potassium perchlorate, and a special ultra-fine aluminum powder known as German aluminum. These have been the only 2 chemicals used in the manufacture of every single exploding firework from firecrackers to M-80s from the 1960s to present times.

United Nuclear's Hydrogen Fuel System Kit is not yet available for sale. There are legal problems with several components of the unit which is preventing its sale. Until the legal proceedings are complete, the company won't be moving forward with the system. (Sources: http://www.switch2hydrogen.com/, http://www.switch2hydrogen.com/, http://www.unitednuclear.com/legalactionletters.htm, http://www.wired.com/wired/archive/14.06/chemistry.html, http://nextconservatism.com/2006/11/14/, http://roguestatesmen.blogspot.com/2006/05/who-wants-free-energy-anyway.html, and http://peswiki.com/index.php/Directory:Suppression.)

Daniel Dingel: Converts More than 100 Cars to Run on Water

Inventor Daniel Dingel, who lives in the Philippines, since 1969 has converted more than 100 gasoline cars to be powered by hydrogen derived ON DEMAND from plain water. Aluminum is used in the tank to suppress a possible explosion. The Philippines President is not interested because of an agreement with the World Bank. For a link to a movie abut his water-powered cars, see Section 12-G of http://www.byronwine.com/. For more on the Philippines experience with the international bankers, see http://www.indybay.org/newsitems/2006/04/10/18144521.php.

Maker of water-powered car still fighting after 30 years

By Joey G. Alarilla (see http://www.wasserauto.de/html/inquirer_article.html.)

1969 was a landmark year for a number of reasons, including the conquest of space and cyberspace. Even as that year saw Neil Armstrong and Buzz Aldrin walking on the moon, so was the Internet born when its earliest incarnation, the United States Defense Department's Arpanet (Advanced Research Project Agency network), went online.

In the Philippines, 1969 was also the year that a Filipino inventor claims to have started tinkering with a revolutionary concept for the automotive industry. His idea: To power cars using hydrogen derived from ordinary water.

Today, 30 years later, inventor Daniel Dingel is driving around in the only water-powered car in the world, still complaining that Filipino government officials and scientists refuse to support his invention.

"They keep saying that the government is pro-poor, but what they do is sell off the resources and wealth of the Philippines. The government should really support the development of technology that would help the country pay its huge foreign debt," he said.

At the Inquirer parking lot last Tuesday, Dingel showed off his "concept car"- a red 16-valve Toyota Corolla with the small hydrogen reactor that he invented hooked up to its internal combustion engine (ICE). Dingel's hydrogen car has actually received media coverage since the late '80s or so, but to date his invention has not yet been patented and commercialized. Dingel attributed this to the influence of multinational companies, such as the oil companies. A conspiracy theory worthy of the X-Files, perhaps, but if Dingel's idea is real, then the truth is way out there.

How it works:

According to him, his reactor uses electricity from a 12-volt car battery to transform saltwater or ordinary tap water with salt into deuterium oxide or heavy water, which is chiefly used as a coolant for nuclear reactors. Deuterium is actually a hydrogen isotope with twice the mass of ordinary hydrogen, and heavy water is produced when the hydrogen atoms in H_2O are replaced with deuterium.

"The electricity from the battery splits the water into its hydrogen and oxygen components, and this hydrogen can then be used to power the car engine. Normally it takes temperatures of about 5,400 degrees Fahrenheit to generate hydrogen from water, but here I am just using an ordinary 12-volt battery," he claimed.

Just how this kind of chemical reaction is possible using an ordinary car battery is, of course, the secret behind Dingel's invention – and the kind of claim that leads people to dismiss him as a crackpot and charlatan. In fact, while hydrogen is being touted as a viable alternative fuel in the US and other countries, these prototypes do not make use of internal combustion engines but fuel cell engines, nor do they run on ordinary water but on liquid hydrogen.

For example, DaimlerChrysler unveiled in the US in March the hydrogen-powered NECAR 4 (New Electric Car), which is based on a Mercedes-Benz A-class compact car.

In these fuel cell cars, water is just a by-product of the reaction between hydrogen and oxygen ions, which produces the electricity to run the car's engine. In this sense, the fuel cell process is the reverse of Dingel's discovery. Also, Dingel claims that his reactor can work with any existing ICE-based car.

Dingel said some investors from Taiwan now plan to commercialize his car and help him get an international patent.

(End of excerpt)

Update (*Electrifying Times* (www.electrifyingtimes.com), Vol. 10, No. 2, 2007, page 22):

Dingel did get some of his international patents and was given a sizeable sum of money from yet unknown sources to keep his invention quiet. The secret formula for Dingel's technology as well as the late Stanley Meyer's water cell car is a certain resonant frequency and voltage that allows much lower energy to produce hydrogen and oxygen from water than the standard electrolysis method requires. Stay tuned.

This writer, Gary Vesperman, included a possibly similar invention in his somewhat obsolete compilation of "Advanced Technologies for Foreign Resort Project" which is in http://www.icestuff.com/~energy21/advantech.htm. It is copied as follows:

Water Engine. Hydrogen is formed by creating an underwater electrical discharge between two aluminum electrodes. Aluminum wire is fed against a rotating aluminum drum. A hydrogen-fueled 900-kilogram car runs 600 kilometers on 20 liters of water and one kilogram of aluminum.

The required high voltage can be obtained from the battery, a generator off the drive shaft, or two coils in parallel and fed from a conventional distributor.

The hydrogen gas fills a small buffer tank which in turn supplies hydrogen to the engine on demand. When the tank's pressure exceeds a predetermined level, the electrodes are separated so that hydrogen generation is interrupted. As the pressure drops to a certain level, the aluminum wire is again fed against the aluminum drum.

Ken Rasmussen: Water-to-Energy Electrolysis Process

Ken Rasmussen and his team have been working on a water-to-energy electrolysis process that turns out to have similarities to that of Professor Kanarev. Both use a pulsed signal, and both were seeing similar performance rates. Kanarev holds multiple patents, and is widely published.

Their work ceased after a member of the research team was threatened at gunpoint on 16 May 2006. Unknown to Rasmussen, his associate had faced a violent confrontation with 4 young to middle-aged white males in black suits driving a late model black Lincoln Town Car.

Shoving Glocks and Mac-10s in his face at a rural intersection, they told him extensive details about his family and threatened lives of him, family and all associates if he didn't stop work on the process immediately and NEVER go to the authorities. His associate, now scared for his own life and that of his family, complied. But similarly to Bill Williams' case (see below), when happy people start acting silent and paranoid, friends get suspicious.

In the good old days, big business bullies offered lots of money to buy somebody out and eliminate the competition. Stanley Meyer claimed before his suspicious death that he refused an offer of a billion dollars from Arab oil interests if he would stop work on his electrolysis process. (Meyer received at least eight patents in addition to US Patent 4,389,981 relating to hydrogen and oxygen gasses extracted from water for fuel.)

But to date, NOBODY has offered Ken's company a dime for their "yet bench top" technology. BUT somebody HAS threatened to KILL THEM. Would any skeptic out there care to explain that to Ken? Ken had been in discussion with several pre-screened, suitable investors, who were waiting on Ken's company to fix a final detail before showing them a live demonstration.

Enormous amounts of personal information thrown in their face behind the guns proved to Ken NONE of the prospective investors had anything to do with the violence we experienced. These thugs knew things Ken DIDN'T EVEN KNOW. Their boss has digital cell phone tapping technology at the very least. Other details were probably obtained by wire tapping neighbors and friend's phones too.

For any of Ken's previous business contacts reading this, please excuse the delay. The lives of Ken and his associates have been directly threatened if they were to complete the item they were intending to demonstrate. All progress is stopped.

Given the nature of oil or banking history, who do you think paid these hired gunmen to do the dirty work? Ken would appreciate some solid leads. Ken has to admit, oil has become intertwined with both banking and government over the years; so unofficial policies may have changed.

For more energy invention suppression details, see Ken's web site http://www.commutefaster.com/klooz.html.

Bob Boyce: Brown's Gas Carburetor

Bob Boyce built a carburetor using hydrogen and oxygen previously split using proper frequencies. See http://www.greaterthings.com/News/Tilley/testimonials/related/Bob_Boyce.htm.

From: "Bob Boyce" <theghost@realmcity.com>
To: <sterlingda@greaterthings.com>
Sent: Monday, October 07, 2002 8:38 PM
Subject: GTcontact

Hello there

I just read your response to the message from someone asking why you're promoting a fraud (Tilley), and I must commend you on your response. There are a lot of closed-minded and narrow-minded people out there, most of whom were highly educated in traditional schooling methodology taught at most of the universities and colleges throughout the world. They get this doctrine shoved down their throats that if it's not documented in books and/or upheld by popular theory, then it's just not possible. Any attempt to demonstrate such technology usually falls on deaf ears and blind eyes because they refuse to adjust their thinking to accept that maybe something may be possible after all.

I learned the hard way about how society treats those that dare to do something different. I'm not seeking publicity or recognition for any research I did, just wanted to privately relate my experiences with you and ask that you please not publish or share this with anyone. (See link above. Sterling Allan must have subsequently obtained Boyce's permission to publish his story. Gary Vesperman)

I had an electronics business down in south Florida where I owned and sponsored a small boat race team through my business starting in 1988. We had a machine shop out back of my business for doing engine work, and I worked on engines for other racers and a local mini-sub research outfit that was building surface running drone type boats for the U.S. Government's Drug Enforcement Administration (DEA).

I delved into hydrogen research where I was building small electrolyzer type units that used distilled water mixed with an electrolyte. I would then resonate the plates for optimal conversion efficiency.

I discovered that with the right frequencies, I was able to generate monatomic hydrogen and oxygen, which when recombined, produces about 4 times the energy output of normal diatomic hydrogen and oxygen molecules since the process of combustion does not have to break apart the molecules first before recombining into water vapor. Diatomic hydrogen requires about 4% to air to produce the same power as gasoline, while monatomic requires slightly less than 1% to air for the same power.

The only drawback was storage at pressure causes the mono-atoms to start joining into diatomic pairs, and the mixture weakens, so it must be produced on-demand and consumed right away. I used modified LP carburetors on the boat engines to deal with using vapor fuel. I even converted an old Chrysler with a slant six engine to run on the hydrogen setup and we tested it in the shop.

I never published anything of what I was working on, and we always stated that our boats were running on hydrogen fuel, which was allowed, to avoid any controversy at the races. It wasn't until many years later that I found out what I had stumbled upon was already discovered and known as "Brown's Gas", and there were companies out there selling the equipment and plans to make it.

I had never tried to market anything, but I was plagued with trouble ever since I did the conversion to the old Chrysler and did a few test runs on it in the shop. My shop, which had never had any major crime problems before, suddenly was getting broken into, and pieces of equipment related to the hydrogen project were getting vandalized or stolen. I thought it might be that one of the guys that worked for me might have leaked something to someone and they were trying to either steal the technology or stop me from working on it. I ended up shutting down the research, getting out of it all, converting the boat engines back to racing fuel and selling off the race boats. The break-ins stopped, and I had no further trouble up until I totally closed the business and retired in 1991.

I was struck by lightning in 1995 and in 1997 I moved out of Florida, the lightning capital. I am now crippled with arthritis (which is common amongst lightning strike survivors), and recently I developed congestive heart failure/pulmonary edema. I may be weak in body, but I am determined to try to stay as active as I can. I am currently stripping down an old 1984 Dodge Aries with only 29K original miles so I can convert it over to electric operation.

I have been seeking all information I can find to be able to apply this unique charging arrangement that Tilley is using and to find out what type of electric motor would be best to use with it. I'm in the eastern TN area in the mountains so it must have enough power to climb the uphill grades and hopefully be able to regenerate on the downhill grades. So far I have found very little information on this. Any help you could provide to steer me in the right direction would be appreciated.

Thank you,
Bob Boyce

Stanley A. Meyer: Water Fuel Cell-Powered Car

Stanley A. Meyer invented a water fuel cell, which is not to be confused with the well-known fuel cells using membranes, etc. Meyer's device is supposed to break water into hydrogen and oxygen gases using less energy than that present in the bond itself. Furthermore, ordinary tap water requires the addition of an electrolyte such as sulphuric acid to aid current conduction; Meyer's cell functions at greatest efficiency with pure water.

More precisely, Meyer claimed his super-efficient electrolysis process produces 700% more energy than it consumes (for instance, by connecting it to an engine that would burn the hydrogen back into water) without raising the temperature of the water. Meyer assembled a car prototype powered by a water fuel cell.

Meyer's water fuel cell consists of stainless steel plates arranged as a capacitor – with pure water acting as the dielectric. A rising staircase of direct current pulses is sent through the plates at roughly 42 kilohertz, which is claimed to play a role in the water molecules breaking apart with less directly applied energy than is required by standard electrolysis. The mechanism of this reaction is undocumented.

Using his super-efficient hydrogen separator, Stanley Meyer claimed he could drive a water fuel cell- powered car from California to New York averaging 100 miles per gallon of water.

Meyer has demonstrated his fuel cell device before Professor Michael Laughton, Dean of Engineering at Mary College, London, Admiral Sir Anthony Griffin, a former controller of the British Navy, and Dr Keith Hindley, a UK research chemist. According to these witnesses, the most startling aspect of the Meyer cell was that it remained cold, even after hours of gas production as his system appeared to operate on mere milli-amperes, rather than the amperes that conventional electrolysis would require. The witnesses also stated:

"After hours of discussion between ourselves, we concluded that Stan Meyer did appear to have discovered an entirely new method for splitting water which showed few of the characteristics of classical electrolysis. Confirmation that his devices actually do work come from his collection of granted US patents on various parts of the WFC system. Since they were granted under Section 101 by the US Patent Office, the hardware involved in the patents has been examined experimentally by US Patent Office experts and their seconded experts and all the claims have been established."

Meyer received at least eight patents in addition to US Patent 4,389,981 relating to hydrogen and oxygen gasses extracted from water for fuel. The granting of a US patent under Section 101 is dependent on a successful demonstration of the invention to a Patent Review Board.

U.S. Patent 5,149,407: Process and apparatus for the production of fuel gas and the enhanced release of thermal energy from such gas
U.S. Patent 4,936,961: Method for the production of a fuel gas
U.S. Patent 4,826,581: Controlled process for the production of thermal energy from gases and apparatus useful therefore
U.S. Patent 4,798,661: Gas generator voltage control circuit
U.S. Patent 4,613,779: Electrical pulse generator
U.S. Patent 4,613,304: Gas electrical hydrogen generator
U.S. Patent 4,465,455: Start-up/shut-down for a hydrogen gas burner
U.S. Patent 4,421,474: Hydrogen gas burner
U.S. Patent 4,389,981: Hydrogen gas injector system for internal combustion engine

"It Runs on Water" is a video with Stanley Meyer demonstrating the water fuel cell in a car. Meyer claimed that he could run a 1.6-liter Volkswagen Dune Buggy on water instead of gasoline.

The basic problem with Meyer's invention, as reliably reported by Eugene Mallove in an Infinity Magazine article (see http://www.rexresearch.com/meyerhy/meyerhy.htm), is that he had never consented to conclusive tests. Skeptics point out that electrolysis of water, as explained by chemistry textbooks, requires more energy to break the hydrogen-oxygen bond than is regained by burning the two gases. Nonetheless Meyer's supporters suggest it is worthwhile to try to successfully replicate his process.

Stanley Meyer died after eating at a restaurant on March 21, 1998. Coroner William R. Adrion's autopsy report states that "Decedent supposedly at lunch with N.A.T.O. officials at a Cracker Barrel diner. The group made an opening toast with cranberry juice, immediately after which, decedent ran outside followed by his brother, then vomited violently and told his brother that he had been poisoned."

At the time of Meyer's death this writer, Gary Vesperman, sent out an email explaining that there is a type of stroke in the base of the brain that matches his brother's description of how Meyer died. The victim immediately becomes highly aggravated for a fraction of a minute or so. After the brain soaks up too much blood, its oxygen flow is shut down and the victim then dies.

Meyer's unusual death and its suspicious timing and circumstances understandably cause offerings of conspiracy theories regarding the possible poisoning of his cranberry juice by the oil companies and the U.S. Government. It apparently has not been verified who were with Meyer in the restaurant and exactly what they were celebrating.

The discussion below of Stanley's legal hassles is from http://www.waterfuelcell.org/moreinfo.html. If true, it cites more than one instance of intentional tampering with judicial due process – doubtless to discredit his water-fueled car invention. Either Stanley Meyer's water fuel cell did not in fact achieve his performance claims, or the United States federal government and Ohio state government should instead have been supporting Stanley's research.

Fraud charges:

It failed to work during a required demonstration of the water-fueled car in a 1990 court case. An Ohio court found Stanley Meyer guilty of "gross and egregious fraud" in a case brought against him by disgruntled investors. The court decided that the centerpiece of the car, his water fuel cell, was a conventional electrolysis device, and he was ordered to repay the investors $25,000.

However, in their 1 December 1996 issue, the London Sunday Times published an article entitled "End of Road for Car that Ran on Water" by Tony Edwards. It upheld the court case, stating that three "Expert Witnesses" were not impressed and decided that the WFC was simply using conventional electrolysis. It stated Stan Meyer was found guilty of "gross and egregious fraud" and was ordered to repay the investors their $25,000. It implied that Michael Laughton, professor of electrical engineering at Queen Mary and Westfield University, London was due to examine the car, but was not allowed to see it.

However, not mentioned was that this occurred in 1990 and that the WFC Water Fuel injector tech-base was still under U.S. National Security Review as in accordance to U.S. Patent Law and not available for public viewing. Also not mentioned were the many WFC patents, verified laboratory and university testing that supports the basis of WFC technology nor was the WFC appeal filing to dismiss Judge Corzine's ruling due to judicial default and other relevant information.

On 18 October 1995, a pretrial deposition hearing to inspect the WFC Dealership demonstration units (Variable-plate Electrical Polarization Process (VIC) Fuel Cell and Rotary Pulse Voltage Frequecy Generator Tubular-Array Fuel Cell) was held in the office of the plaintiff's attorney, Robert Judkins. Present were the plaintiff's, their attorneys, plaintiffs expert witness, Michael Leverich (Electronics Engineer), Stan Meyer, Dr. Russel Fowler, WFC witness and defense attorneys Judge Roger Hurley and James Detling, as well as a deposition recorder.

During the deposition, Attorney Judkins attempted to have the WFC dismantled prior to implementing proper test procedures, which Stan Meyer refused. Michael Leverich confirmed that his initial measurements of the WFC Fuel Cells showed that it operated exactly as the WFC documentation stated it should, as so recorded on WFC Deposition Video Tape.

However, he then added an unknown white substance (powder) for additional testing. Stan objected to this, since the WFC Fuel Cell uses plain tap water and does not require a chemical additive. The plaintiffs also admitted that, during their observances at WFC Dealership Seminars, tap water was always used without any chemicals added to the water. Despite Stan's objection, plaintiff measurements were taken of this chemicalized water-bath and recorded. This illegal act of tampering with WFC Evidence of Records was witnessed by WFC Cameraman, Dr. Russ Fowler, and all others who attended Plaintiffs Deposition To-Test.

In 1996, Stan Meyer gave oral testimony before the court demonstrating the WFC Fuel Cell "Mode of Operability" by using the Voltage Intensifier Circuit (VIC) to produce voltage of opposite polarity to separate and disassociate the water molecule into its component gases, hydrogen and oxygen. However, the court audio sound recording equipment seemed to malfunction and was switched off. Judge Corzine said proceedings should continue without it. This was a violation of judicial protocol, since the recording system is used to verify testimony given during the trial and as such becomes "Evidence of Records."

After his oral testimony, Stan expected Attorney/Judge Hurley to start bringing forth WFC witnesses and counter arguments. Instead, Attorney/Judge Hurley spoke up, stated he had to leave for a pre-planned vacation and said that there was no more testimony to be given and waived the right of the defendant to give a case summary of the WFC facts brought before the court. Stan Meyer immediately stated he would protest, and Judge Corzine ended the hearing.

Stan wrote a "Request to Retract" fax-letter to the Sunday Times on 2 December 1996. He attached WFC documentation on the filing with the Disciplinary Counsel. He further stated that Judge Corzine had no right to turn off the court audio sound recording equipment, nor to rule against U.S. Patents, or overrule Government and University lab reports in the public domain concerning the mode of operability of the WFC Technology. Furthermore, Stan pointed out that no US Federal "Cease and Desist" order has ever been issued against WFC since the WFC Technology has been fully legalized under US Patent Security Law 35 USC 101 and other US Federal regulatory Acts. His final statement was that "WFC is here to stay" in contradiction to the Sunday Times statement.

Stanley Meyer's twin brother Stephen Meyer has warned per his email below that the above is not wholly true. Attempts by Gary Vesperman to obtain Stephen's corrections have been unsuccessful. Stephen's web site www.hydrotechgroup.com still does not include any information which could clarify Stanley's apparent suppression troubles and suspicious death.

From: Stephen Meyer [mailto:appli-tech@msn.com]
Sent: Wednesday, March 14, 2007 12:18 AM
To: altenergy2007@gmail.com
Subject: RE: Fwd: Terry Sisson on Stanley Meyer; Xogen

HI Guys, go to my web site www.hydrotechgroup.com

Oh! Gary Vesperman's write up is really bad and does not reflect true events about Stan and is completely out of context in many areas. It is my hope that this is article is corrected before publishing. Stephen Meyer his twin…

Stephen Meyer
Appli-Tech@msn.com
Office Phone: 1.612.374.1609

Frank Roberts: Water Car

Frank Roberts is active on the Yahoo water car chat board. He was gone for a while. Then he showed up with this story that was emailed to the Yahoo water car chat board on October 4, 2005. His location is unknown. He is trying to rebuild what he had from memory, but is having a difficult time at it.

Subject: I'm Back

Hello to everyone in the water car group from Frank Roberts

To the older members of the group I say hello; to the newer ones I'm a member who had a working water car and was preparing to go cross country and see some of the members, etc. My last message was about a year and a half to two years ago, I'm not sure. At that time I reported to the group that my office was invaded by authorities and all my paper work was photographed and some taken. My van that I was working on for a carbureted vehicle was burned in the middle of the night, and my fuel injected Taurus was taken. I suffered a chemically induced stroke and am now in a nursing home. I have lost part of my long term and short term memory. My paralysis is pretty much gone, and I now have internet access in my room. I have a lot of catching up to do on the progress of the group. I no longer have my lab and all its resources but will try to contribute from experience and expertise. I look forward to hearing from the group. It's good to be back on line.

Best Wishes,
Frank Roberts

Andrew Leech (Reporter): Suspicious Deaths of Inventors in Australia

From: Andrew Leech
To: sterlingda@pureener gysystems. com
Sent: November 02, 2006
Subject: BJ Proton Cell

Hello, I'm Andrew Leech from Floppy Sponge Automation in Melbourne, Australia. I've been a keen experimenter in a number of energy areas for some time now, both privately and through FSA. I'm especially interested in the Joe Cell and could help in a setting up a reliable demonstration model of the Proton Cell variant as well as helping to spread and promote the technology… [Deleted]…

I personally believe if we can have development undertaken relatively quietly through supportive channels such as PES Network, and produce a number of engines running this way privately, then distribute them quietly aver a large area (Colin at FSA has numerous contacts right across Australia, Malaysia and Taiwan), when it is announced publicly it will already be out there too widely to be hushed up. I've heard reliable confirmations of suspicious deaths on inventors in Australia, so don't want to take the threat lightly. If we can have a large group of replications all announced simultaneously we have a chance of getting around that threat… [Deleted]…

Regards,
Andrew Leech
Floppy Sponge Automation
12 Birch Ave Dandenong Nth,
Vic, Australia 3148
http://www.floppyspongeonline.com

Gerald Schaflander: Solar-Produced Hydrogen Turned into Liquid Hy-Fuel

During the 1970s Gerald Schaflander, with the Solar Electric Power Corporation of Culver City, California, and with financial help from some friends, built a pilot production facility in Menlo Park, California. Schaflander had developed gallium aluminum arsenide/gallium arsenide solar cells and was producing hydrogen with the cells' output, which was then chemically turned into a liquid fuel called Hy-Fuel. The fuel could be utilized in cars or trucks. It was not used as a liquid but as hydrogen gas, by cracking it and feeding the recovered hydrogen gas through a special carburetor.

Schaflander and his scientists had found from their own experiments that silicon will not work. It deteriorates in the desert heat and becomes only about 2 percent efficient. Having found silicon cells unsatisfactory, Schaflander's scientific team perfected gallium aluminum arsenide/gallium arsenide solar cells. They also found a way to produce such cells on a semi-automated basis, slashing costs. Some of the photovoltaic cells used to power NASA spacecraft cost as much as $5 a watt to produce; Schaflander's automated process reduces the cost to 27 cents a watt.

The prototype of a commercial Hy-Fuel production facility on 1000 acres of leased land near Yuma, Arizona comprised of two lines of slanted solar panels that gather the sun's rays. Behind them were rounded, cylindrical "parabolic concentrators" that intensify the energy collected by the panels and focus it on photovoltaic cells. The cells produce electrical energy, and electrolysis then splits the hydrogen atoms from water. The hydrogen gas so produced is turned into a stabilized liquid similar to ammonia. The liquid Hy-Fuel is fully substitutable for fuel oil or for gasoline in automobiles, tractors and other vehicles. These are connected by wires and tubing to a small pumping station and rounded storage tanks.

This Yuma solar energy farm was the creation of Consumers Solar Electric Power Corporation of Culver City, California. On July 1, 1980 the firm had its first commercial tank load of 250 gallons of Hy-Fuel ready for delivery at only 50 cents a gallon, and was producing more Hy-Fuel. With an option on leasing another 10,000 acres and given financial support, the facility could be cranked up to full production on the entire 11,000-acre tract in six months. According to Stephen Wright, president of Consumers Solar and its scientific expert, with eight hours of continuous Arizona sunlight a day, such an energy farm would produce 3.8 million gallons of Hy-Fuel a day.

Hy-Fuel production could be increased considerably by substituting Soviet-developed high-efficiency crystal lattice solar photo-voltaic cells (see below).

A unique co-generation system would turn the waste heat produced by the process into low-pressure steam that could be used to drive turbines producing electric power for the utilities. Schaflander estimates that his company's energy farm could produce electricity at a capital cost of $690 per kilowatt. The capital-cost figures for fossil-fueled and nuclear-powered plants are $1,200 and $1,400 per kilowatt, respectively. Note that these are 1980 figures.

Conversion of present engines to hydrogen fuel can be accomplished in a few hours. The process involves removing the gasoline tank and installing a new tank capable of holding the slightly heavier hydrogen hydride mixture. A "cracker" would be positioned in the front of the car next to the motor to convert the ammonia-like Hy-Fuel into a gas mainly composed of hydrogen. This gas would flow into a new carburetor to which a fuel regulator is attached. Certain other solenoid valves and vacuum and pressure switches would be wired into the car. The hydrogen-powered vehicle would then be ready to roll.

There is no question that Hy-Fuel works. Schaflander had converted eighteen Chevrolet engines to his revolutionary fuel and had driven them across the continent, getting about twenty miles to the gallon. Tests show that Hy-Fuel's emissions are far cleaner than gasoline, obviating the need for costly emission devices such as catalytic converters which poison roadsides with toxic platinum dust particles. Hy-Fuel is also more stable than gasoline – far less likely to explode in case of an accident.

All this was developed without a dime of federal tax money. In 1978 Schaflander challenged a U.S. House of Representatives Energy Committee to let him test his device on a selected fleet of U.S. Government cars. Although he asked for no up-front money and had promised, "If we can't deliver, we don't get paid," the U.S. Government turned him down.

Schaflander was harassed by oil company-inspired opposition, including telephoned death threats to his 79-year-old mother and quite "official" opposition from the U.S. Postal Service. His company was essentially driven out of business. The whole story is described by a long article that was published in the October 4, 1980 issue of *The Nation*. There is much detail on the suppression, but little data on the actual process used. (Source: "The Hydrogen Alternative: Somebody Doesn't Like Hy-Fuel" Fred J. Cook, *The Nation*, October 4, 1980, pp. 305-311)

John Andrews: Water-to-Gasoline Additive

In May 1974 John Andrews, a Portuguese chemist, demonstrated a water-to-gas additive before Navy officials which allowed ordinary water to be added to gasoline without decreasing the combustibility of the gas and would drive the cost of gasoline down to 2 cents per gallon. When Navy officials finally went to his lab to negotiate for the formula, they found Andrews missing and his lab ransacked.

Phil Stone: Engine Runs on Water

During the 1950's, Phil Stone, a retired Florida college physics professor, had a patent for a device to run an engine on water. The U.S. Government then unfairly classified his patent, and this prevented him from developing his device. The United States Patent Office has classified 5000 patents, an unknown number of which relate to energy. Their helplessly shackled inventors will be jailed for 20 years if they work on, develop, make, sell, write about, or even simply talk about their inventions.

Bill Williams: Joe Cell-Powered Truck

(Excerpted from http://pesn.com/2006/04/13/9600257_Bill_Williams_threatened/, written by Sterling Allen, Pure Energy System News)

Joe Cell Truck Builder Threatened, Destroys Plans --- After announcing that he had successfully built a truck that runs on Joe cell technology, drawing energy from water and orgone energy, Bill Williams said he was approached by two men who demanded that he stop his research, threatening him with dire consequences if he didn't. Others are keeping it alive.

USA -- A couple of weeks ago, Bill Williams told a discussion list that he successfully ran his truck on a device known as the Joe cell. The power was far greater than the regular combustion engine -- and the energy was free.

The Joe cell is said to draw on orgone energy. The fairly simple device uses electrically charged water as the "gate" or medium through which the aetheric energy is drawn from the surroundings and transferred to the automobile engine.

Bill had posted images and rough descriptions, and was in the process of disclosing in greater detail how he had accomplished this, when he was confronted last week by two unidentified individuals who told him to cease all of his alternative energy work or there would be dire consequences.

On April 11, 2006, Bill gave the following account of what happened just a few days after announcing his success.

"I was on my way home Thursday last week [April 6, 2006] and was about 3 miles from the ferry project. I stopped to check the post connection point on the Cell. I was standing in front of my truck, and this late model 2005 or 2006 Ford Explorer pulled up and parked diagonally in front of my truck.

"The driver got out of the rig and walked around in front of their rig and approached me. At about the same time, the passenger opened his door.

"The driver stated that they wanted me to stop working on all forms of alternative energy. He also stated that we know everything about me, my family, and all my projects past and present.

"At about that time the passenger reached and held up a file that was about 2 or so inches thick. He opened it up and showed me telephone transcripts, emails, messages from the groups that I had belonged to.

"They knew where my kids worked, the times they are at work; also my wife's working hours, my grandkids' school, etc. They knew everything.

"The driver said that if I did not stop working on this (he then opened up the left side of his jacket and showed his weapon that was holstered) that there would be other consequences.

"He also stated that he wanted me to post that I was no longer working in this field and to destroy all my work, i.e. cells, drawings, lab journals, everything!

"At that point he walked around and got into the rig. I shut the hood and got the hell out of there. They followed me for about 2 miles and then must have turned off somewhere."

After a few days of contemplation, Bill decided to abide by the demands of those who threatened him. He destroyed the cell and all data and documentation and disabled the website on which he had posted plans. Four days after that incident, Bill wrote the following message to the group:

"I thought I was strong but when illness to the family comes into play, I have failed. I am truly sorry. I will not be working in any form of alternative energy field anymore. [...]

"I destroyed my device tonight along with my written data and lab notes as per specked out."

Thomas E. Bearden, Ph.D.: Motionless Electromagnetic Generator

In March 2002, Stephen L. Patrick, Thomas E. Bearden, James C. Hayes, Kenneth D. Moore, and James L. Kenny received U.S. Patent No. 6,362,718 for the Motionless Electromagnetic Generator (MEG), a scalar energy device that produces over-unity (AKA "Free Energy"). In conventional terms, the device has a Coefficient of Performance (COP) of 5.0.

Tom Bearden offers this brief description of how the Motionless Electromagnetic Generator works:

First the MEG uses a proven technique (the Aharonov-Bohm effect) which the nanocrystalline core furnishes freely. Recall again that memory characteristics of materials is one thing (from Prigogine) that allows direct and intentional violation of the second law of thermodynamics.

This free initiation of the Aharonov-Bohm effect in turn engineers the surrounding vacuum outside the core, by adding extra energy density to it in the form of a curl-free A-potential. Sharp perturbation (the rise time and decay time) of the input pulses that perturb the core-confined B-field, also perturb that section of the A-potential still in the core, so that a disturbance of dA/dt passes outside the core and on outward into the external altered vacuum with its extra energy.

There the equation $dA/dt = - E$ applies, and so in the external activated space real E-field energy pulses are formed which radiate back into the MEG core area due to the minus sign. This means they travel in opposite direction to the outward-traveling perturbation dA/dt.

Hence this shows the receipt by the MEG of excess electromagnetic energy freely transmitted back into it from the external altered space, which means that the MEG gets considerable excess E-field energy input from the surrounding vacuum. By adjusting perturbation rise times, etc., one can adjust the magnitude of the E-field energy pulses returned to the MEG from the external vacuum environment. Thus the MEG is an asymmetric Maxwellian system of the kind arbitrarily discarded by Lorentz in 1892, and still arbitrarily discarded by present EE departments, professors, and textbooks.

Comprised of strong magnets, coils, nanocrystalline cores, and a controller unit with the electronics, the MEG would be able to power an electric vehicle without battery recharging by the power grid.

For a detailed explanation (including clear drawings) of how the MEG works, see Dr. Bearden's paper "Engineering the Active Vacuum: On the Asymmetrical Aharonov-Bohm Effect and Magnetic Vector Potential A vs. Magnetic Field B,". This paper is available at the link http://www.cheniere.org/techpapers/On%20the%20Aharonov-Bohm%20Effect1.doc.

In that paper, Dr. Bearden points out that electrical engineers – and even the usual physicist – are unaware of how an electrical circuit is actually "powered". For an explanation and a diagram showing (1) where the energy pouring from the generator terminals actually comes from and how, and (2) why the normal electromagnetic systems self-enforce COP<1.0 by killing their own source of this free energy flow faster than they power their loads, see Figure 2, Operation of a Symmetrical Electrical Power System, in the foregoing paper.

Note that there are more than 20,000 papers in the hard literature on the Aharonov-Bohm effect used by the MEG, and that Aharonov-Bohm effect is quite well proven in physics, both theoretically and experimentally. But the effect does not even exist in the electrical engineering model! Since the MEG is deliberately designed to use that effect, the operation of the MEG can only be understood by one who understands the Aharonov-Bohm effect, its generalization to the Berry phase, and the further generalization to the geometric phase. Specifically, any electrical engineer – using only mainstream electrical engineering theory – can not and will not be able to understand the MEG's operation.

There are several sources of the special nanocrystalline cores which contain the "B" field needed to effectively operate the MEG. Dr. Bearden reports in http://www.cheniere.org/correspondence/020504.htm that the nanocrystalline cores originally were purchased as Metglas amorphous alloys from the former Division of Honeywell that made them. He believes that Honeywell actually got them from India. That Division of Honeywell was just about demolished by General Electric (GE) in its sudden attempted buyout of Honeywell (vetoed by the European community). GE suddenly moved it across country, wiping out half its staff and scientists, etc. Then GE withdrew. With the Division in shambles, Honeywell then sold it off to Hitachi. He doesn't know what's happened since then

(Sources: http://jnaudin.free.fr/meg/megv21.htm, http://peswiki.com/index.php/Site:LRP:Motionless_Electromagnetic_Generator, and http://peswiki.com/index.php/Site:LRP:The_Suppression_of_the_M.E.G._by_General_Electric. For additional information, order Dr. Bearden's books and videos from www.cheneire.org.)

Thomas E. Bearden, Ph.D. (Reporter): J.P. Morgan Emasculated Electrical Engineering Theory

Thomas E. Bearden, Ph.D., in an August 5, 2007 email to Gary Vesperman and three other energy researchers, offers an insight into what really happened more than a century ago when the foundations were laid for eventually providing electricity to billions of people. In the 1880s and 1890s Nikola Tesla (backed by Westinghouse, a decent man) destroyed the great dreams and preparations of John Pierpont Morgan and Thomas Edison for moving the world into DC electrical power, requiring a DC power plant about every two miles, for example. Instead, with the support of Westinghouse, Tesla gave the world the much more practical AC power systems, where the electric power is much more easily transmitted over transmission lines to distant destinations, without the serious losses as DC transmission entails.

This and Tesla's clearly enunciated intention to give the world clean free electromagnetic energy from the "active medium" itself, brought J. P. Morgan to regard Tesla as his mortal enemy, to be destroyed or curtailed at any cost. Then with the near-bankruptcy of Westinghouse, the only person Tesla could turn to for financing was J. P. Morgan himself. The university attended by Morgan in Germany was the heart of the Hegelian method, which uses the technique of funding and backing one's own enemies as well as one's supporters, to gain influence over – and eventually control of – both. So when Tesla approached Morgan for financing, Morgan readily agreed – but only after Tesla signed over a 51% controlling interest in his (Tesla's) patents.

Tesla did so, and that put control of Tesla, his patents, and his great new project directly under Morgan's control. Morgan then simply advanced Tesla only part of the money needed for his tower project, and when Tesla predictably ran out of funds, Morgan simply refused to give him any more. Very shortly this completely crushed Tesla, reducing him to effective bankruptcy, living in a hotel room, and existing on the patience and literally the charity of others. Tesla never recovered from this blow, but eventually died in that hotel room. Many of Tesla's inventions – such as radio – were stolen from him. After Tesla expired in 1943, Marconi's inventions – e.g. – were officially declared as take-offs of Tesla's inventions by the U.S. Supreme Court.

Isn't it significant that essentially none of our scientific history books credit Tesla for being the actual inventor of the radio, but instead give credit to the theft of Tesla's radio discoveries by Marconi? What does that say about the "official" ethics of the scientific community?

But Morgan was not only ruthless, but thorough. In the latter 1880's, etc., when Tesla was gung ho to give us free energy from the active medium, Morgan also anticipated the future of this "energy freely extracted from the active medium" problem that had suddenly risen in Tesla's work. At the time, there were less than three dozen "electrodynamicists" in the entire world. Maxwell had died in 1879, and those who despised quaternions (Heaviside, Hertz, Gibbs, etc.) immediately chopped Maxwell's 20 quaternion-like equations in 20 unknowns into a very much smaller vector subset containing only four equations. Maxwell's theory was never accepted during his own lifetime, but only begrudgingly and very slowly after (eight or nine years after Maxwell's death) Hertz performed speed-of-light measurements showing Maxwell was correct.

The real Maxwell theory has never been routinely taught in electrical engineering, which contains only a pale shadow of it. For the full Maxwellian theory, see James Clerk Maxwell, "A Dynamical Theory of the Electromagnetic Field," Royal Society Transactions, Vol. CLV, 1865, p 459. Read Dec. 8, 1864. Also in The Scientific Papers of James Clerk Maxwell, 2 vols. bound as one, edited by W. D. Niven, Dover, New York , 1952, Vol. 1, p. 526-597. Two errata are given on the unnumbered page prior to page 1 of Vol. 1. In this paper Maxwell presents his seminal theory of electromagnetism, containing 20 equations in 20 unknowns. His general equations of the electromagnetic field are given in Part III, General Equations of the Electromagnetic Field, p. 554-564. On p. 561, he lists his 20 variables. On p. 562, he summarizes the different subjects of the 20 equations, being three equations each for magnetic force, electric currents, electromotive force, electric elasticity, electric resistance, total currents; and one equation each for free electricity and continuity. Most electrical engineers have never even read Maxwell's theory, even though they were falsely informed that they had studied (and mastered) "Maxwell's theory."

Free download of that original Maxwell theory can be made directly from the ZPE website, at links

http://www.zpenergy.com/downloads/Maxwell_1864_1.pdf
http://www.zpenergy.com/downloads/Maxwell_1864_2.pdf
http://www.zpenergy.com/downloads/Maxwell_1864_3.pdf
http://www.zpenergy.com/downloads/Maxwell_1864_4.pdf
http://www.zpenergy.com/downloads/Maxwell_1864_5.pdf
http://www.zpenergy.com/downloads/Maxwell_1864_6.pdf
http://www.zpenergy.com/downloads/Diagram.pdf

Barrett (one of the co-founders of ultrawideband radar) comments on the curtailing of Maxwell's theory as follows:

"[T]he A field [for the potentials] was banished from playing the central role in Maxwell's theory and relegated to being a mathematical (but not physical) auxiliary. This banishment took place during the interpretation of Maxwell's theory... by Heaviside... and Hertz. The 'Maxwell theory' and 'Maxwell's equations' we know today are really the interpretation of Heaviside... Heaviside took the 20 equations of Maxwell and reduced them to the four now known as "Maxwell's equations". [Terence W. Barrett, "Electromagnetic Phenomena Not Explained by Maxwell's Equations," A. Lakhtakia, ed., Essays on the Formal Aspects of Electromagnetics Theory, World Scientific Publishing, River Edge, NJ, 1993, p. 11.]

Actually it was worse than that! Heaviside hated potentials (which today we know are primary), thought they were mathematical conveniences only, and that they should be "murdered from the theory". Quoting from B. J. Hunt:

"In a letter to Oliver Lodge in 1893, Heaviside referred to his own work and stated that it represented '….the real and true 'Maxwell' as Maxwell would have done it had he not been humbugged by his vector and scalar potentials.' [B. J. Hunt, The Maxwellians, Ph.D. dissertation, The Johns Hopkins University, Baltimore, MD, 1984, p 317].

Heaviside also thought (as did all others at the time) that a thin material fluid ether filled all space, so that nowhere in all the universe was there a point where mass was absent. For that reason, the electrodynamicists – including Heaviside – thought there were force fields E and H in space, when today we know such electromagnetic force fields exist only in charged matter (matter is a component of force, by the equation F = d/dt(mv). Quoting Feynman:

"…in dealing with force the tacit assumption is always made that the force is equal to zero unless some physical body is present… One of the most important characteristics of force is that it has a material origin…" [Richard P. Feynman, Robert B. Leighton, and Matthew Sands, The Feynman Lectures on Physics, Addison-Wesley, Reading, MA, Vol. 1, 1964, p. 12-2].

For a commentary on even the unsatisfactory condition of the original Maxwell's theory, Cornille states it this way:

"Even today, Maxwell's equations are given as granted, their validity being justified by experiments. In fact, there is no demonstration of Maxwell's equations from first principles since the mechanical approach used by Maxwell has been abandoned in favor of a new non-mechanical entity: the electromagnetic field. Of course, Maxwell's equation[s] can be obtained from a variational principle but they are derived from an action appropriately chosen in order to recover them. …Maxwell's equations raise a certain number of fundamental questions which have not been answered in a satisfactory manner to date." [Patrick Cornille, "Inhomogeneous waves and Maxwell's equations," Chapter 4 in Essays on the formal Aspects of Electromagnetic Theory, Ed. A. Lakhtakia, World Scientific, 1993, p. 138-139.].

But it made no big splash, and the Heaviside severely truncated equations were "chosen" as the basis equations for the new "electrical engineering" that was beginning to be set up in a few universities here and there. Morgan apparently had the "new" equations (for the new electrical engineering being born) checked via group symmetry (adopted in 1870, so therefore well known by the very few leading electromagnetic scientists of the world at the time) to see if the "new" science/equations contained any of those "systems taking excess free energy from the active medium" – in short, containing any of Maxwell's asymmetrical systems present in the full Maxwellian theory. In short, Morgan was determined not only to suppress Tesla, but also to suppress any future "young Tesla" who might be stimulated to see and develop "free energy from the active medium" Tesla systems. The review of Morgan's scientific advisors was not good; the "new" and truncated Heaviside equations were still not totally symmetrical, which meant some of those dirty old asymmetric Maxwellian systems were still there.

Morgan, of course, just directed that it be "fixed". And Lorentz was the fellow chosen or arranged to do the job; in 1892, Lorentz arbitrarily symmetrized the Heaviside equations – just to "make them easier to solve algebraically", so the story went. He thereby firmly excluded all asymmetrical Maxwellian systems from the standard electrical engineering model, from its very birthing.

Lorentz was a great scientist in his own right, but also was fond of appropriating and using other people's work and taking credit for it himself. For example, the whistle was finally blown on this aspect of Lorentz, by the great electrodynamicist J. D. Jackson. See J. D. Jackson and L. B. Okun, "Historical roots of gauge invariance," Reviews of Modern Physics, Vol. 73, July 2001, p. 663-680. Even the symmetrical regauging used by Lorentz (and credited to him generally) was first done by Lorenz (without the "t"), as Jackson and Okun show.

To see the original Lorentz "suppression" paper applying symmetrical regauging, see H. A. Lorentz, "La Théorie électromagnétique de Maxwell et son application aux corps mouvants," [The Electromagnetic Theory of Maxwell and its application to moving bodies], Arch. Néerl. Sci., Vol. 25, 1892, p. 363-552. [Also in H. A. Lorentz, Collected Papers, The Hague : Martinus Nijhoff, vol. 2, pp. 168-238, esp. p. 168.] This is the work that Lorentz cites later (in 1895) for his proof of the symmetrical regauging theorems (the two equations of symmetrical regauging).

This is what arbitrarily eliminated (from standard electrical engineering) the use of "Tesla" asymmetrical Maxwellian systems that do receive excess electromagnetic energy freely from the active medium – and thus can function at a coefficient of performance (COP)>1.0 precisely similar to a windmill-driven electrical power system or a solar panel powered electrical power system. A real system with real losses will always have efficiency (total useful energy or work output divided by the total energy input from all sources) of less than 100%. But if it asymmetrically receives (freely or nearly freely) excess energy from its active environment, then its coefficient of performance (total useful energy or work output divided by the total energy input by the operator only) can permissibly exceed 1.0. No laws of nonequilibrum thermodynamics are violated, as are no laws of physics.

Two persons – Oliver Heaviside and John Poynting – independently and simultaneously discovered the flow of electromagnetic energy through space in the 1880s and early 1890s; before then, the concept does not appear in physics. Poynting only considered a very tiny part of the "total electromagnetic energy flow pouring from the generator terminals and flowing through space outside and along the external conductors (of the external circuit)". That tiny part is the small fraction of the energy flow – the linear part – that gets diverged into the conductors to "potentialize and power up the electrons" and the external circuit. Heaviside also discovered a giant curled electromagnetic energy flow component in addition to the diverged little component. The nondiverged curled electromagnetic energy flow component is more than a trillion times greater in energy magnitude than the feeble Poynting component.

Well, again it would simply not do (in Morgan's relentless view) for our young future electrical engineers to know and be taught that the generator actually outputs more than a trillion times as much electromagnetic energy output as the mechanical energy input one furnishes to crank the shaft of the generator. That would mean it would just be a matter of time before some young budding genius would discover how to trick some of that giant curled Heaviside component into diverging into the conductors after all, thus producing Tesla "energy from the external active medium" systems after all.

So again, Morgan would have issued orders to "fix it!"

And so Lorentz was arranged once again to do the dirty work. In 1900 he stated that this giant curled Heaviside component "does nothing", since it does not interact, and so it "has no physical significance". And he arbitrarily just integrated the entire energy flow vector (containing both the diverged Poynting energy flow component and the usually nondiverged Heaviside giant curled energy flow component) around a closed surface assumed around any volume element of interest. Thereby Lorentz misinformed us that this nondiverged giant energy flow had "no physical significance" and taught us to just deliberately cancel it as a matter of course.

In his August 16, 2007 email to Gary Vesperman and Leslie Pastor, Thomas Bearden adds:

For additional rigorous mathematical demonstrations, see the following:

M. W. Evans et al., "Explanation of the Motionless Electromagnetic Generator with O(3) Electrodynamics," Foundations of Physics Letters, 14(1), Feb. 2001, p. 87-94. Quoting: "…the fundamental operational principle of the MEG is explained using a version of higher symmetry electrodynamics known as O(3) electrodynamics, which … has been developed extensively in the literature. The theoretical explanation of the MEG with O(3) electrodynamics is straightforward: Magnetic energy is taken directly ex vacua and used to replenish the permanent magnets of the MEG device, which therefore produces a source of energy that, in theory, can be replenished indefinitely from the vacuum. Such a result is incomprehensible in U(1) Maxwell-Heaviside electrodynamics."

M. W. Evans et al., "Explanation of the Motionless Electromagnetic Generator by Sachs's Theory of Electrodynamics," Foundations of Physics Letters, 14(4), 2001, p. 387-393.

M. W. Evans et al., "The Aharonov-Bohm Effect as the Basis of Electromagnetic Energy Inherent in the Vacuum," Foundations of Physics Letters, 15(6), Dec. 2002, p. 561-568.

T. E. Bearden, "Extracting and Using Electromagnetic Energy from the Active Vacuum," in M. W. Evans (ed.), Modern Nonlinear Optics, Second Edition, 3 vols., Wiley, 2001; Vol. 2, p. 639-698.

A quote of interest is: “This has led to one of the greatest ironies in history: All the hydrocarbons ever burned, all the steam turbines that ever turned the shaft of a generator, all the rivers ever dammed, all the nuclear fuel rods ever consumed, all the windmills and waterwheels, all the solar cells, and all the chemistry in all the batteries ever produced, have not directly delivered a single watt into the external circuit’s load. All that incredible fuel consumption and energy extracted from the environment has only been used to continually restore the source dipole that our own closed current loop circuits are deliberately designed to destroy faster than the load is powered.”

T. E. Bearden, "Energy from the Active Vacuum: The Motionless Electromagnetic Generator," in M. W. Evans (Ed.), Modern Nonlinear Optics, Second Edition, 3-vols., Wiley, 2001; Vol. 2, p. 699-776.

M. W. Evans, T. E. Bearden, and A. Labounsky, "The Most General Form of the Vector Potential in Electrodynamics," Foundations of Physics Letters, 15(3), June 2002, p. 245-261.

For a rigorous proof that removing Lorentz's 1892 arbitrary symmetrization of the Heaviside-Maxwell equations does indeed provide usable energy currents from the vacuum, see M. W. Evans et al., “Classical Electrodynamics without the Lorentz Condition: Extracting Energy from the Vacuum,” Physica Scripta, Vol. 61, 2000, p. 513-517.

To see the horrible falsities (as pointed out by eminent scientists such as Nobelist Feynman) being taught in electrical engineering in all our universities, see my paper “Errors and Omissions in the CEM/EE Model,” available at http://www.cheniere.org/techpapers/CEM%20Errors%20-%20final%20paper%20complete%20w%20longer%20abstract4.doc . This paper was favorably reviewed by the National Science Foundation; for the NSF letter see http://www.cheniere.org/references/NSF%20letter%20Bearden.jpg .

Here is a little exercise that is revealing to think about:

Take a common permanent magnet and sit it on the bench. Lay an electret across it so the E-field of the electret is at right angles to the H-field of the magnet. Then by the ordinary Poynting theory already accepted and contained in every basic electrical engineering textbook, that silly thing sits there and continuously pours out a steady Poynting stream of real electromagnetic energy flow S, given by $S = E \times H$.

The CEM/EE folks just shrug and walk away from that embarrassing problem. A typical comment is one by Buchwald:

"[Poynting's result] implies that a charged capacitor in a constant magnetic field which is not parallel to the electric field is the seat of energy flows even though all macroscopic phenomena are static." [Jed Z. Buchwald, From Maxwell to Microphysics, University of Chicago Press, Chicago and London, 1985, p. 44].

He states it, but does not pursue its implications at all.

Scientists such as Van Flandern do point out that a so-called “static” electromagnetic field is actually a nonequilibrum steady state system, comprised of internal parts in continuous and steady motion. Quoting Van Flandern:

“To retain causality, we must distinguish two distinct meanings of the term ‘static’. One meaning is unchanging in the sense of no moving parts. The other meaning is sameness from moment to moment by continual replacement of all moving parts. We can visualize this difference by thinking of a waterfall. A frozen waterfall is static in the first sense, and a flowing waterfall is static in the second sense. Both are essentially the same at every moment, yet the latter has moving parts capable of transferring momentum, and is made of entities that propagate. …So are … fields for a rigid, stationary source frozen, or are they continually regenerated? Causality seems to require the latter.” [Tom Van Flandern, “The speed of gravity – What the experiments say,” Physics Letters A, Vol. 250, Dec. 21, 1998, p. 8-9].

So there is no problem at all in establishing as large a continual free electromagnetic energy flow as one wishes. Anywhere, anytime. Simply make a dipole, or crossed E and H dipoles, then leave it alone. As Nobelist Lee pointed out, when you have a broken symmetry then something virtual has become observable. In other words, any electromagnetic broken symmetry can and does absorb virtual energy from the vacuum, integrate it coherently into quantum sized particles (photons), and emit those real, observable photons at light speed in all directions. This process – the solution to the long-neglected "source charge problem" – is what produces the steady-state or "static" electromagnetic fields. Such fields are actually continuous, free flows of real, usable electromagnetic energy.

The entire "free energy from the vacuum" problem is simply this: Given incredible "free electromagnetic energy wind" available and automatically provided from every electromagnetic broken symmetry (dipolarity) in the universe, how does one build a proper asymmetric "windmill" to intercept and collect some of that real, free, continuous "electromagnetic energy wind energy" and then separately dissipate it in its loads to power them? All our electrical engineers think, design, and build only symmetrical windmills, which use half their freely collected electromagnetic energy to do nothing but destroy their own source dipolarity furnishing the free wind! The other half is used (in the forward emf region) to power the losses and loads of the external circuit.

So half the "freely collected" energy is normally used (in the EE's symmetrical circuits and systems) to destroy the wind source itself, and the other half is used to power the external loads and losses. Well, to keep the wind flowing, we have to keep "restoring" the internal dipolarity (broken symmetry) of the generator as fast as it is being destroyed. That is what "cranking the shaft of the generator" actually accomplishes; it doesn't send a single joule of energy directly out onto the external circuit or power line! Note that the rigorous definition of work is the change of form of energy. When we crank the generator shaft, we input mechanical energy, which once the generator rotates is changed (courtesy of Nikola Tesla!) into rotating magnetic field energy inside the generator itself. In turn, this rotating magnetic field energy is dissipated totally inside the generator, to force opposite charges apart and thus to produce that magic source dipolarity with its broken symmetry. The broken symmetry of this internal dipolarity then absorbs virtual state energy from the seething virtual state vacuum, and transforms it to real, observable photons (real, usable electromagnetic energy) which it continually pours out. It is this stream of real electromagnetic energy flow that pours from the terminals of the generator and along through space outside the external conductors.

A tiny portion of this giant energy flow (the Poynting component) is diverged into the conductors to "power up the electrons" and thus power the circuit. A huge curled giant Heaviside component remains, but (in any special relativistic situation) is not diverged, does not interact, and does nothing.

But the generator actually outputs more than a trillion times as much total electromagnetic energy flow (in both the feeble Poynting electromagnetic energy flow component and the accompanying giant Heaviside curled electromagnetic energy flow component) as the mechanical energy that we physically input to the shaft of the generator.

The knowledge of Heaviside's giant usually-nondiverged energy flow component is what Morgan also had "scourged" from the theory by Lorentz in 1900, so that all the future electrical engineers would think that they only produce the diverged Poynting component of energy flow and nothing else.

Very good modern classical electrodynamicists continue to ignore any and all curled energy flow components accompanying the Poynting linear flow component. Quoting Jackson :

"...the Poynting vector is arbitrary to the extent that the curl of any vector field can be added to it. Such an added term can, however, have no physical consequences. Hence it is customary to make the specific choice …" [J. D. Jackson, Classical Electrodynamics, Second Edition, Wiley, 1975, p. 237].

Let us comment: Jackson is quite correct so long as the situation remains special relativistic. In that case, vector analysis holds and the divergence of the curl is zero. The curled giant energy flow component thus does not diverge or interact with anything.

But if the situation is deliberately made general relativistic or deliberately involves a properly synchronized general relativistic operation, then Jackson's statement is false. In that case, a bit of that giant curled energy flow component does diverge after all, and comes into the circuit to help power it. In optical physics, the negative resonance absorption of the medium (NRAM) phenomenon (released by the Russians in 1967) is just such a process, though that is completely unknown to our optical physicists. But in the optimized narrow frequency experiments using laser input energy, the COP is actually COP = 18 as experimentally measured every year in all leading optical physics groups worldwide.

But none of them are allowed to say "excess emission", but are force to use the deliberately mind-numbing phrase "negative absorption". Anyway, we proposed using that NRAM process to build heat amplifiers in steam boilers, so that with closed positive feedback the steam boiler can be made self-powering. This would immediately and dramatically lower the consumption of coal, nuclear fuel rods, natural gas, etc. in most of our electrical power plants already built and deployed. For a crude little paper on it, see Thomas E. Bearden and Kenneth D. Moore, "Increasing the Coefficient of Performance of Electromagnetic Power Systems by Extracting and Using Excess EM Energy from the Heaviside Energy Flow Component". PPA, filed and obtained in Oct. 2005. Now released into public domain and freely given away to the public domain. It is available at http://www.cheniere.org/techpapers/PPA%20Increasing%20COP%20by%20addnl%20extractn%20from%20flow1a.DOC .

As you can see, our electrical engineers are deliberately (and unknowingly) trained to only build symmetrical systems that destroy their free energy wind input faster than they use some of it to power the loads, and that do not do anything "general relativistic" so that a part of that now-unaccounted giant curled Heaviside electromagnetic energy component also gets diverged (and thereby converted into an extra Poynting energy component). In short, our own electrical engineers, professors, and departments self-enforce COP<1.0 performance and are thereby directly responsible for the world energy crisis, giant pollution of the biosphere, and the deaths of hundreds of millions of impoverished peoples world wide!

The thing is this: Our scientific community should fund and permit the bright young theoreticians and bright young professors to tangle with the technical problem of how to go about building asymmetrical interception and powering systems, once they easily assemble a free electromagnetic energy wind source for furnishing the input energy freely from the vacuum. Let them first remove the diabolical Lorentz symmetrization from their present Heaviside equations, and then ponder how to then build a nice "asymmetric windmill" that will intercept and collect some of that freely flowing electromagnetic energy, and will separately use (dissipate) it to power the external loads without disturbing the "crossed dipoles and their broken symmetry".

Comment by Gary Vesperman: Was John Pierpont Morgan really that sharp a bean-counter?!! In spite of his demonstrated ruthlessness and his exploitation of the genius Nikola Tesla, we would have to give him credit for his conjunction of acute business acumen with his not inconsequential understanding of physics. Morgan left a legacy of energy invention suppression that endures to this day.

Frank Richardson: Magnetic Electrical Generator and Bladeless Steam Turbine

As told to Gary Vesperman by Frank Richardson, during the 1970's four Nevada Test Site (NTS) technicians helped Frank Richardson, an NTS electrician, invent a magnet-based electrical generator that required no input power and also a bladeless Tesla-type steam turbine.

Richardson's "Electromagnetic Convertor with Stationary Variable-Reluctance Members" (US Patent No. 4,077,001) uses two pairs of electromagnets to warp a permanent magnet's magnetic fields back and forth across output field coils to induce a DC output voltage. Dr. Thomas Bearden's motionless electromagnetic generator (see above) is based on the same principle.

The bladeless steam turbine has a closed-loop cycle that Richardson claimed is far more efficient than the electric motor in terms of converting electrical energy into rotational energy for application to a vehicle's drive wheels. The water is heated with radio frequencies like a microwave oven into steam that is then forced through two disks in sequence. The electricity for the water heater came from the generator.

The two disks are perforated in such a manner as to prevent cavitation (bubbles) even at high rotational velocity. Since steam offers a 1,000-to-1 expansion ratio compared with gasoline's expansion ratio of approximately 300 to 1, the turbine is extremely powerful. An 18-inch diameter prototype's output power was measured at approximately 1,000 horsepower.

A Volkswagen Beetle was outfitted with these inventions and driven around without energy input.

Some people tried to steal these two inventions. Two of the technicians died under suspicious circumstances, and Richardson had to go into hiding until his recent death. It is Gary Vesperman's understanding that the black helicopter people might have had nothing to do with this situation; just greed.

Gary Vesperman (Reporter): Energy Inventors are Buzzed by Black Helicopters

A few years ago one summer, an energy inventor's house was buzzed twice by a black helicopter. He said they appeared to be an older Hughes model painted black and with no markings. He asked a friend who is an air traffic controller at the local airport. His friend reported no radar sightings. One of the buzzings was witnessed by dozens of people although the inventor himself wasn't home. (Gary Vesperman has since then come across an article in his zero point energy literature which claims that the radar-absorbing coating on black helicopters and also black Stealth fighters and B-2 Stealth bombers is depleted uranium.)

Also about that time the energy inventor and some other people narrowly escaped a flip and crash in a private plane which had a cut on a tire. The cut was then hidden by rolling the plane.

Las Vegas UFO buff Tym Schofield was driving around the desert one year when some black helicopters swooped low over his car and gave him a really good scare. He was on his way home after appearing on a radio talk show.

A female Las Vegas resident met a former black helicopter pilot at a 1995 Christmas party. The pilot had become so disgusted he quit. Subsequently, the driver of a car attempted to run over the ex-pilot and killed his wife instead. Gary Vesperman tried to locate the pilot so he could interview him but was unsuccessful.

Bob Dratch, inventor of the thorium powerpack (see below), reports back in the late 90's during one of the winters he had picked up his son from the bus-stop. He went past his old machine shop which he had in an old farm house and continued up the hill to his house. As Dratch crested the hill top he noticed hovering below the ridgeline out of sight of "radar" from the flatlands a black helicopter with something that looked like a high-powered "shotgun-like" antenna on the nose. The copter was totally silent, black, numberless and pointing this "thing" at his shop. After having dropped off his child at home he went back down to his shop and found all his computers were OFF line, and not booting any more. Had his equipment just gotten zapped with an electromagnetic pulse? Was he being snooped on long range? Who knows?

The town was about 10 miles due west of Golden Colorado, and the mountain they were nearest is called Mount Tom. They were between Mount Tom and Dratch's shop, very close to the hilltop closest to him (within about 500 feet), but about 8 miles SE of the large mountain (Mount Tom), just clearing the hill's ridge and below tree line. He would not have seen them at his shop as at that altitude they were below tree line, but hovering silently. When he crested the hill that was when he was above tree line for a moment, and saw them there. He no longer has his shop at the old location as a few years after that all the water dried up in the wells. He supposes that is just a coincidence.

The black choppers now and then make a point of buzzing him, and/or hovering. But Dratch hasn't had any ground attacks – just this aerial stuff. Generally they tend to appear when he runs tests...

(The two black helicopter stories below were excerpted with permission from Erik Masen's article SUPPRESSION FROM HIGHER UP Inventors Beware! The Deadly Campaign Against Free-energy Devices, *Electrifying Times*, Vol. 8 No. 3 and also in http://www.electrifyingtimes.com/erik_masen_suppression.html.)

At the International Tesla Society conference in 1993, a videotape of an advanced generator utilizing tachyon waves was presented without the inventor's permission. This generator not only produces excess energy, but also exhibits time-warping characteristics. The tape was shown on a Friday afternoon, 3,000 miles from the inventor's home.

The very next day, U.S. Government's Federal Bureau of Investigation (FBI) and Bureau of Alcohol, Tobacco and Firearms (ATE) agents knocked on the inventor's door wanting to see the device. He politely told them no.

The following day, a black helicopter hovered above his house taking pictures of the inside. (These black helicopters and even some satellites apparently now have the capability of photographing every item inside a building.)

On a recent morning talk show featuring the U-2 spy plane, it was revealed that the plane's audio receivers are so sensitive they can pick up ground-level conversations from an altitude of 70,000 feet.

(The black helicopter stories below were told to Gary Vesperman at the 1997 International Tesla Society Symposium in Colorado Springs, Colorado by health physicist John W. Moreland, Ph.D.,1251 Smith Thompson Road, Bethpage, TN 37022 (near Nashville); voice 615-888-3428. Moreland publishes and sells 34 engineering and physics textbooks – mostly old books that he thought ought to be republished and made available. He has accumulated several yards of files on unconventional energy devices.)

It is reportedly possible to approach within a half-mile of a base east of Nashville, Tennessee which houses at least 100 black unmarked helicopters, some black unmarked C-130 transport airplanes, and black unmarked jeeps.

A county commissioner, whose jurisdiction includes Nashville and who owns a farm, became upset with black helicopters flying over his farm at night scaring and scattering his animals. He complained to Congress, the Department of Transportation, Federal Aviation Agency, etc. without satisfaction.

Some years ago, an inventor in another city had his house buzzed a few times by black helicopters. One night during a particularly aggravating buzzing, the inventor shot down the black helicopter which killed both pilots and demolished his house. He was arrested and charged with murder. At a hearing, his lawyer held up a Washington Post newspaper headline "Federal Government Claims Black Helicopters Don't Exist". The charges were dropped because black helicopters don't exist.

So afterwards when another inventor in early June one year at 2 a.m. had his one-story house buzzed by a black helicopter 3 feet above his roof, he went outside with a flashlight and a pistol. He aimed the light at the pilot, ran the light along the fuselage and after finding no identifying numbers, told the pilot he doesn't exist. He then disabled the tail rotor with his pistol. (He didn't want to injure the two pilots.) The helicopter took off fishtailing from side to side. Since then he hasn't been visited by black helicopters.

Black humor? It could be supposed that these two shooting incidents prove that it must conveniently now be legal open season on black unmarked helicopters. Keep in mind though that their pilots are only employees of the U.S. Government (see http://www.nogw.com/shadow.html) who are being paid to spy on, harass and buzz targeted American citizens, particularly energy inventors who potentially are able to put large energy industries out of business. Some of these black helicopter pilots may even be wondering about why they are participating in suppression of new energy inventions.

Erik Masen, in his article "Suppression of Quantum Leap Inventors", *Electrifying Times*, 2007, Vol. 10, No. 2, wrote that some say that black helicopters are part of the Bureau of Alcohol, Firearms, and Tobacco which operates under the U.S. Treasury Department, which in turn operates with the U.S. Federal Reserve, which is a private corporation, which operates with the World Bank, over which the U.S. Government apparently has no jurisdiction. Thus, the black helicopters can do as they please.

Gary Vesperman (Reporter): Shielding Over-Unity Power Converters

A typical radio wave that is radiated out of an antenna comprises of transverse waves of electromagnetic energy. These transverse radio waves oscillate perpendicularly to the axis along which they are traveling.

The zero point energy field is an immensely energetic medium, omnipresent throughout the universe, of random electromagnetic waves with frequencies ranging from near zero to frequencies so extremely high as to be undetectable.

An over-unity power converter generates more output power than the input power it needs to operate. Hence its ratio of output power to input power is greater than one. That is, it is operating at "over-unity". Its leftover output power is thus available to do useful work for "free"; hence the popular term "free energy" machine.

Some types of over-unity power converters are designed to extract energy from the zero point energy field. What's interesting is that longitudinal waves of electromagnetic energy are emitted during the energy extraction process. That is, these longitudinal electromagnetic waves oscillate along the axis of their travel, not perpendicular to the axis like transverse radio waves.

Detecting these longitudinal electromagnetic waves requires special sophisticated instruments. The U.S. Government maintains a network of such instruments in orbiting satellites to monitor the entire earth for these signals. (This same network is also employed to usefully detect, locate by triangulation, and report lightning bolts in real-time which helps to justify the network's enormous expense.)

If a longitudinal electromagnetic signal is picked up, it is assumed that an inventor is experimenting with a working over-unity power converter or generator. The location of the device is triangulated, and the inventor is then "visited", liquidated or whatever by energy invention suppression hit squads in order to safeguard markets for gasoline and metered centrally generated electricity.

Copper-lined Faraday cages, normally used for shielding radio waves, are not adequate for blocking these signals from over-unity converters of zero point energy. One experimenter has suggested using bismuth.

The all-seeing Big Brother effectiveness of the U.S. Government's zero point energy extraction detecting and tracking network has been demonstrated by one zero point energy experimenter's complaint:

"I have not been able to locate any type of material that will shield this type of energy. The best advice is to work underground and operate only for brief periods of time 10 to 15 minutes at random times. Also heavy cloud cover, wind, rain and other thunderstorms are good for masking your experiments.

I had black choppers and power company trucks crawling all over me within 15 minutes when I discovered an over-unity effect in my shop. I think they would have been at my door if I had not shut the unit off when I did. They changed every ground and insulator on all the power poles for miles around my location looking for the source of the energy they had detected."

This writer, Gary Vesperman, pieced together the above from various sources. David G. Yurth questions its accuracy per his July 7, 2006 email below.

Gary: You may want to consider the following with respect to your descriptions of both radio waves and the ZPE field phenomena.

Radio waves are indeed waves of electromagnetic energy. In some cases they are transverse, and in some cases they oscillate perpendicular to the axis along which they are propagated. But in the case of the CTHA antenna, for example, which is really a magnetic resonance oscillating antenna device, the wave form can be either spherical or hemispherical. In some cases, as in the case of the devices we demonstrated several years ago, the wave form can be narrowed to as little as .1 degree second in a semi-hemispherical form.

In most cases, RF waves radiate in a straight line from the propagation point – that is why, for example, RF devices used during the day have a range that is limited to less than 22 miles [on flat topology], unless repeater towers are provided at key points along the horizon. However, with the CTHA device, particularly when it is used on the surface of large bodies of water, and more particularly when used on the surface of salt water, the hemispherical wave form coheres to the surface of the water and is attenuated at only about 10% the normal rate of RF signals propagated through the air. In addition, because of the nature of water itself, extra low frequency radio waves are the only RF waves that can be relied on to propagate a signal through any appreciable distance of water. However, with the CTHA, this is not true. These devices have been shown to send RF signals through the water at much higher [VHF and UHF] frequencies than any other known devices, with minimal attenuation and virtually no distortion. Why they operate in this way is not known to science in general and to the US Navy in particular.

My notion about this is that the CTHA configuration propagates non-local field effects as well as linear ones. Because the non-local effects are neither understood nor optimized in the current technologies, what we observe is the effect of a non-linear wave propagation device used in applications which are typically linear. The Y-Bias manuscript explains how this works and why it is important.

Finally, the zero point is probably not *an immensely energetic medium, omnipresent throughout the universe, of random electromagnetic waves with frequencies ranging from near zero to frequencies so extremely high as to be undetectable.*

Rather, as the Y-Bias research suggests, the zero point is the interface between the physical vacuum and the 4-D physical universe we live in. It is not something extrinsic to the physical world we observe but is utterly intrinsic at the finest scales of organization. This insight is the reason the Y-Bias information is so important. What it means, for example, is that neither Tom Bearden's MEG nor Correa's orgone generator is really operating at the zero point or anywhere near it. Rather, what they are doing is tapping the quantum pump that operates within the organizational structure of all matter and energy at the fourth scale of development to liberate an infinite supply of electrons via one biased voltage schema or another.

What the Heavyside equations and Whittaker's formulation make clear [quaternions] is that every variety of physical material exhibits a quantum oscillating frequency. Modern science has only just begun to understand the importance of this concept so the literature is not yet replete with references to the quantum frequencies of all the elements and their isotopes. Nevertheless, when the quantum frequency of any material can be excited by an outside force which causes it to operate in a narrowly defined local in terms of a harmonic resonance, the dynamic properties of self-organizing criticality kick in to produce exponentially more powerful internal oscillations than would normally occur within the sub-atomic structure of the material.

We know this because when carefully prepared isotopes of certain rare earth materials are intercalated within the crystalline lattice structure of conductive thin films, and then exposed to permanent magnetic fields, the atoms of the isotope produce prodigious amounts of electrical voltage and current continuously, without consuming either the atoms themselves nor the materials within which the atoms are held in stasis in the lattice itself.

We have a prototype engine which is in its third generation now that has been operating continuously for 76 days. The data recorder shows that the power output has remained steady day and night throughout the test period. The mass of the material has not changed one iota in that time and neither has the composition of the substrate, the crystalline material or the original atomic isotopes themselves.

Bearden solved the source charge problem partially when he demonstrated that mass is organized and deconstructed at the zero point with a quantum frequency that absorbs a virtual photon from the physical vacuum and then liberates a real photon when two virtual charge ensembles combine to form the organized datum which is characterized at the second scale of organization. This operation goes on continuously within the heart of every iota of material found everywhere in the universe – it is this fact, born out by the Y-Bias analysis, that gives the lie to the Big Bang Theory. All primary particles were not created at the instant of the Big Bang – instead, everything about the cosmos is being recreated at a quantum rate all the time, at every address in the cosmos, continuously, as part of the autopoietic nature of this physical dimension.

So when any inventor tells you he is generating transverse waves of non-local propagation when tapping the zero point, you can write that research off as fundamentally flawed because the phenomena you are referring to has nothing at all to do with the zero point. --- Dave

(This writer, Gary Vesperman, recently edited David G. Yurth's ground-breaking 153-page physics monograph "Y-Bias and Angularity©: The Dynamics of Self-Organizing Criticality from the Zero Point to Infinity". I also edited Yurth's 380-page "Seeing Past the Edge" which explores and ties together such advanced scientific topics as nuclear physics, mind-matter connection, holographic universe, and the torsion field.)

Ph.D. Electrical Engineer: Advanced Form of Plasma-Discharge Energy

An inventor and a Ph.D. electrical engineer from one of our prestigious universities had made a breakthrough on an advanced form of plasma-discharge energy. They hired a hall in a mid-sized town in the U.S. to show off their new discovery. It was an impressive demonstration.

One day, his neighbors told one of them they had seen a black helicopter hovering over his house for several hours while he was away at work. Evidently, it was photographing his technology in the basement. A black van, with windows that you couldn't see into, also staked out their lab.

After three weeks of surveillance, a S.W.A.T. team of six kicked down the lab door, and with axes, destroyed half a million dollar's worth of equipment in one-half hour. The thugs forced the inventors' faces down onto the concrete floor, and, demanding to see the nuclear source, beat the inventors' heads against the concrete until they nearly choked on their own blood. They had no search warrants, just "S.W.A.T. TEAM" printed on the backs of their brownish uniforms.

The inventors were told to cease all further development, and the apartments owned by one of the inventors were condemned. The tenants were ordered to leave, and the Ph.D. electrical engineer is still being harassed by the IRS to this day.

Gary Vesperman (Reporter): Six CIA Agents at 1996 Tesla Society Symposium

When this writer attended an International Tesla Society Symposium in Colorado Springs, Colorado in 1996, I was told that the inventor of a new type of carburetor that can triple the mileage of a car has had his social security number taken away. Also attending the convention were at least one U.S. Government's Central Intelligence Agency (CIA) agent, identified by someone standing in the registration line behind him who happened to see his identification card, and another five CIA agents.

One of the CIA agents threatened a co-inventor of an electrical generator utilizing two types of radioactive waste as he was walking up to the podium to give his speech. However, this story needs further verification.

Gary Vesperman (Reporter): US versus Japanese Support of Cold Fusion

The leading cold fusion community website is http://www.lenr-canr.org/. The site features a library of papers on Low-Energy Nuclear Reactions (LENR) – also known as cold fusion. Chemically Assisted Nuclear Reactions (CANR) is another term for this phenomenon. The site features a library of more than 500 original scientific papers in Acrobat format, reprinted with permission from the authors and publishers. The papers are linked to a bibliography of over 3,000 journal papers, news articles and books about LENR.

In Japan, inventors are treated as national heroes and are lavishly supported. The Japanese government's annual R & D budget in cold fusion had been $100 million per year (since greatly reduced). Japan has issued over 100 low-energy nuclear reaction patents. In contrast the U.S. Patent Office has so far approved only one cold fusion patent application out of 300. (This statistic is possibly out-of-date.)

Stanley Pons and Martin Fleischman: Cold Fusion

Much misrepresentation and falsification of evidence happened after Stanley Pons and Martin Fleischman announced in March 1989 that they had achieved fusion by electrochemical means. Several influential US laboratories (California Institute of Technology, Massachusetts Institute of Technology (MIT), Yale/Brookhaven) reported negative results on cold fusion that were based on shoddy experimental work and a misunderstanding of the Pons-Fleischmann claims. They gave a hostile hot fusion establishment the excuse it needed to conclude that the claims made by Pons and Fleischmann were bogus. In November 1989, a U.S. Department of Energy panel concluded the same after a shallow mock investigation of only seven months. Eugene F. Mallove, Sc.D., was the Chief Science Writer at the MIT News Office at the time. He played a part in exposing the MIT report as mistaken, possibly fraudulent, and resigned in protest over it in 1991. … It is ironic that each of these negative results were themselves the product of the kind of low-quality work of which Fleischmann and Pons were accused. The difference was that the reports said what the hot fusion community wanted to hear. This was the legacy of the 1989 ERAB report, but that legacy must now be reversed – and it will be, however long that takes.

Dr. Mallove later founded and edited/published Infinite Energy magazine until in May 16, 2005 he was robbed and bludgeoned to death by a pair of pathetic drug addicts. The 1999 Issue 24 of Infinite Energy, in its 57-page special report titled "MIT and Cold Fusion: A Special Report", extensively documented that MIT violated the trust of its donors, employees and the public in the integrity of its scientific research into cold fusion.

In addition to suppressing cold fusion, MIT has also suppressed its solid-state lithium-ion roll-to-roll battery patents which would increase the efficiency and performance and lower the cost of electric and hybrid vehicles. See Remy Chevalier's report below on NiMH and solid-state lithium-ion batteries.

Chevalier does ask "Is it because MIT is cashing checks from the Rockefeller Bros. and the Ford Foundation?" So he may be hinting that, possibly based on inside information, MIT's suppression of cold fusion and its battery patents is due to its secret protection of the oil/auto monopoly.

Most people, including physicists, continue to be unaware that low-energy nuclear reactions are real, and have been verified in hundreds of experiments throughout the 1990s. In February 2002, the Space and Naval Warfare Systems Center of the United State Navy in San Diego released a 310-page report titled "Thermal and Nuclear Aspects of the Pd/D_2O System" that discusses the overwhelming experimental evidence that the cold fusion effect indeed exists. Dr. Frank E. Gordon, the head of the center's Navigation and Applied Sciences Department, writes in the foreword:

That "cold fusion" continues to be ignored by the scientific establishment, and, to add insult to injury, is being used synonymously with "bad science", usually in such expressions as "the cold fusion debacle", constitutes one of the greatest scientific scandals in human history, and a human tragedy. While wars over oil are being fought, a potential source of energy that could solve humanity's energy problems for all eternity is being ignored by all but a small community of researchers. At the same time, the dead-end "hot fusion" program continues to receive billions of dollars in public funds. If there is a scandal associated with cold fusion, this is it. (Source: "The Suppression of Inconvenient Facts in Physics – The Cold Fusion Scandal - Rochus Börner, Ph.D., *Cold Fusion Times*, Vol 12 No 2, August 2005. See also http://www.std.com/~mica/cft.html. Excerpted from "The Suppression of Inconvenient Facts in Physics" http://www.suppressedscience.net/physics.html. This paper compiles instances of suppression of honest examination of flaws in some of the major theories held inviolable by Western science bureaucracies. In addition to the supposed impossibility of cold fusion and low-energy transmutation, mainstream Western physicists hotly defend, in spite of "inconvenient facts in physics", relativity theory, the constancy of the speed of light, absence of signals traveling faster than the speed of light, quantum theory, big bang cosmology, impossibility of anti-gravity, commercial hot fusion, and the second law of thermodynamics.)

Mitchell Swartz: U.S. Patent Office Blocks Cold Fusion Patents

Mitchell R. Swartz, MD, Sc.D, has four electrical engineering degrees from Massachusetts Institute of Technology. He is an engineer and physician who has been inventing for decades, and has received many patents. Two of his previous patent applications went to the Board of Patent Appeals and were subsequently issued.

Yet, even with that extensive experience, never before had Swartz seen such misbehavior, systematic prejudice, conspiracy and disingenuous statements as has been demonstrated by the U.S. Patent Office regarding several of his patent applications involving lattice-assisted nuclear reactions, and devices which measure conditions leading to such reactions (often referred to as "cold fusion").

Regarding cold fusion, it is a real science, and Swartz and his fellow researchers have conducted solid, meticulous research for almost two decades. He recently gave lectures to the Defense Threat Reduction Agency and the Naval Research Laboratory, both of which recognized the utility of his work in cold fusion. No one from either erudite group (more than a hundred scientists and engineers) gave even one iota of the disparagement which, in stark contrast, has been doled out from the Patent Office without foundation on a weekly or monthly basis continually for more than two decades. Along with the disparagement, the Patent Office has been disingenuous to the federal courts and the Board of Patent Appeals, and has demonstrated not only a conflict of interest but also salient improper behavior.

The egregious behavior of the Patent Office with respect to cold fusion patent applications has ignored the U.S. Constitution and Congress' directive to "encourage progress and to encourage ingenuity with patentable statutory subject matter to include anything under the sun that is made by man". Supporting said Congressional directive, attention is directed to the fact that issuing a patent would normally be mandated because these processes involve the loading of heavy hydrogen into palladium and its generation to form helium and heat. Such transformation has been declared patentable by the federal courts.

The Patent Office's use of a two-tiered system to chronically discriminate against cold fusion violates many federal laws. Out of more than 300 cold fusion patent applications, the Patent Office has issued only ONE patent – and that single patent is believed to be the Patent Office's accident/mistake.

To illustrate exactly how the Patent Office methodically destroys cold fusion patent applications (and probably many other energy patent applications), Swartz describes two patent applications of his which had nothing to do with the cold fusion process directly, but were in fact methods of improving technologies of measuring loading of hydrogen into metals and of measuring heat production (calorimetry). They both just happen to be useful to cold fusion. The mere hint of application to cold fusion at the Patent Office was enough to warrant (as they see it) harassment, discrimination, and obvious deviation from normal procedure.

The Patent Office concocted several false reasons to scuttle his applications. For example, the Patent Office falsely claimed that Swartz had purported that there was "excess heat" in the invention of a method for improving the measurement of loading of hydrogen into metal. However, those two words were never even mentioned in the patent application. Swartz pointed out to the Patent Office their error, who then studiously ignored his Affidavit – timely filed and supported with many other Declarations supporting him.

The Patent Office's Decision to deny the calorimetry patent application refers to "cold fusion" eighty-six (86) times by inaccurately substituting the words "cold fusion" for the words and phrases "heat production", "activity", "electric power drive", "thermally monitoring", "thermal output", "optimum drive condition", and even for "multiring calorimeter".

Showing systematically hostile, abusive behavior to Swartz and his patent applications, the Patent Office would frequently ignore and not even officially log exhibits and declarations. For example, the Patent Office denied the validity and workability of his two inventions in spite of substantial peer-reviewed documentation of careful measured, professionally witnessed experimental results of actually working prototypes. The Patent Office was able to back up such denials simply by not bothering to log pertinent documents.

To avoid responding to what was filed which is actually required by law and custom, the Patent Office brazenly relied upon reference to art irrelevant to the actual specifications and claims. Responding to the initial denial of his patent application for a vibrating electrode for measuring the loading of hydrogen into metals, Swartz appealed to the Board of Patent Appeal. In their decision to again deny his patent application, the Board's Decision incredibly included only two (2) sentences pertaining to the actual invention. The remainder of the Decision's 28 pages comprised of a stale, totally irrelevant carbon copy attack on cold fusion and Drs. Pons and Fleischmann. This has been one of the Patent Office's typical distraction processes.

The Patent Office has routinely made many false statements in federal documents. For example, they falsely stated once "there is no disclosure..." involving temperature, and again for voltage. Yet the applications do discuss temperature or voltage, and Swartz in his July 30, 2007 letter to Gary Vesperman cited the actual pages where these parameters were discussed more than once.

These two inventions are only two of more than a dozen patent applications Swartz submitted to the Patent Office where the response has been disingenuousness, obstruction, and failure by the Patent Office to abide by a uniform standard consistent with their own rules.

In summary, it is important to remember that this is not an issue of a difference of opinion; it is about a two-tiered system to enable chronic discrimination (suppression) against cold fusion and probably many other energy inventions. It is about an agency of the U.S. Government thumbing their noses at the U.S. Constitution, at the U.S. Congress, at American security, and at American citizens. It is about an agency "losing" checks, "losing" pleadings, "losing" Exhibits, and failing to answer Declarations and pleadings over seventeen years.

The Patent Office remains quite comfortable and shameless as it viciously ignores Article I, Section 8 of the U.S. Constitution, the explicit directives of the U.S. Congress which funds it, and even its own rules. It is egregious and odious that some in the Patent Office use systematic disingenuity to rob inventors, and more importantly America itself of these American-crafted energy-related inventions. The cover-up of cold fusion is complete, as the applications are now transferred overseas to hurt the United States of America.

(Source: In his July 30, 2007 letter to Gary Vesperman, Mitchell Swartz backs up his allegations with specific citations of law, reference to ~140 pounds of over 300 indisputable papers submitted as evidence, legal briefs, etc. Swartz also mailed to Vesperman the August 2005 issue of *Cold Fusion Times* and a copy of a 39-page Petition to the U.S. Supreme Court for a Writ of Certiorari appealing a negative decision by the Board of Patent Appeals and Interferences. Having never before seen a U.S. Supreme Court legal document, I found the Petition fascinating to skim through. For instance, I counted 62 references to previous cases. I used to work as a technical writer preparing computer manuals for 18 Silicon Valley companies. The materials Swartz mailed to me confirm the suspicion I have had for a long time that patents demand the ultimate in technical writing.)

Robert Bass: Low-Energy Nuclear Transmutation

From: Don Quixote II <donquixote@radix.net>
To: Sir Arthur C. Clarke <blenheim@sri.lanka.net>
Date: Saturday, November 25, 2000 8:07 AM
Subject: A WARNING? My micropellet proposal to Japanese government

Have 3 people been assassinated because of the Cincinnati Group's discovery of a low-energy nuclear transmutation process that can be used, e.g., for radioactive waste remediation?

The original 14 addressees are all editors or investigative reporters

From: Bass, Robert W (IDS)
To: Adil Shamoo ; Barbara DelloRusso ; Eugene F. Mallove ; George Miley ; Hal Fox ; Jean-Francois Cazorla ; Jed Rothwell ; Jim Wilson ; Mitchell Swartz ; Pat Bailey ; Patrick Bailey ; Charles B. Stevens ; Elijah C. Boyd ; Marjorie Hecht
Cc: 'Xing-Zhong Li'
Sent: Friday, November 24, 2000 6:50 PM
Subject: My micropellet proposal to Japanese government

PREFACE: It is readily documented that the CIA and the KGB and the Mossad, etc. all have "sprays" which can be sprayed upon someone and cause him to die of apparently natural causes. One famous case occurred (not long after Chris Tinsley's death) in which Mossad agents were caught red-handed spraying a Hamas activist in Jordan, and King Hussein told the Israeli Prime Minister that if they didn't send the antidote quick there would be hell to pay; but it wasn't the Mossad which sent the antidote to Jordan, it was the CIA! (They sent a doctor from the Mayo clinic [who had been previously accused of being a collaborator with the CIA] to revive the victim.) (The "Hamas activist" was apparently Hamas' Syria-based political chief, Khaled Mashaal. As Mashaal lay dying in a Jordanian hospital, King Hussein pressured Israel to provide the antidote in return for releasing the Mossad agents. Gary Vesperman)

So much for people who say that political assassinations by democratic governments are paranoid fantasies.

Hal Fox,

Dr. Li approached me semi-publicly after the American Nuclear Society (ANS) meeting, where he heard me talk about the CG's LENT process. He said that he hadn't wanted to spoil my presentation by saying anything negative, but he wanted ME to know that he himself did NOT believe the CG claims and that he could NOT confirm the claims based on his own experience and that yet he liked me and wanted me to know "the truth." (By the way, did you know that Dr. Li has 35 Ph.D.'s working for him full-time on cold fusion in China with Chinese government support?!!)

Dr. Li said that he had gone to your lab in Utah and watched you and Dr. Jin run the experiment with a "good" gamma ray detector. However, he claims that when the thorium begins to precipitate out, the solid angle of the detector remains unchanged, but the thorium is moving out of that fixed solid angle, so that the radioactivity SEEMS to be decreasing but it is a false alarm.

He said that he took the "before & after" fluids that you gave him back to China and had them tested but with negative results. (But Li did admit that the straight-line graph I showed could not be explained by his negative assumptions and was "affirmative evidence on the side of the CG.")

Don Holloman of CG says that the 7-man team of Francesco Celani et al in Italy tested the CG LENT-1 device so thoroughly that "data reduction" took 37 volunteer undergraduates "months" to complete. In their publication they claim that they achieved both complete "radiometric balance" AND complete "chemical balance" of the before-process and after-process results.

However, Celani's boss died in midlife of alleged "natural causes". And you know that Stan Gleeson of the Cincinnati Group seemed to be perfectly well when he suddenly died at age 48 of "a stroke." George Miley told me that when at ICCF-8 he asked Celani why he didn't follow through on this type of LENT work (which Chris Tinsley was starting in England [having emailed me about Stan's open-beaker LENT test] just before he dropped dead at age ~50 of "natural causes"), the reply of Celani was: "THREE PEOPLE have died, and I don't want to be the fourth!" George Miley thought that Celani was talking about radiation-sickness danger, but that is not what Celani has in mind! The proof that Celani is open to conspiracy theories is that he is on the masthead of the LaRouche magazine and *they* don't merely *suspect* conspiracy, they have been *jailed* by a U.S. Government conspiracy!

Lawrence Hecht shook my hand at the American Nuclear Society meeting after having just got out on parole after 5 years of a multi-decades sentence for "selling securities without a license" which was not [even] a crime in VA when he sold "political loans" to LaRouche supporters but [despite that] the Secretary of State of VA (who 2 days later was made a Judge as payoff for her cooperation) after studying the matter for 2 weeks decided that Political Loans are indeed 'securities.' (One of Hecht's colleagues is still in jail [illegally] with a 77-year sentence.)

The barbaric nature of a 77-year sentence for a technical infraction is self-evidently PROOF of evil at work: Pres. George Bush's stockbroker brother [Neil Bush of Silverado Bank in Colorado] was REALLY guilty of the same infraction, but he was merely *fined* $1,000 and told to "be more careful" and "don't do it again"!

I feel that my own life has been threatened in writing, indirectly by the British government. Here's why: Nobel Laureate Brian Josephson agreed to show at the historic Cavendish Lab the Mallove cold fusion video which I had hand-carried to him. Dr. Josephson even published in Gene's Infinite Energy magazine a *letter* saying he was going to show the video publicly!

But when there was a conference there and many important scientists present, suddenly Josephson reneged! He told me in writing that he had first showed the video privately to a Very Important Person (I suspect Sir Brian Pippard, J's own teacher, after whom TWO buildings at Cambridge are named!); then he, Josephson, was "convinced" by said VIP that it is "for the best" that the public be "allowed to continue to believe" that the whole CF/LENR thing was a delusion!! I tried to get J to say why *he* had agreed. He replied (with copies of his email to me both to Gene and to Yeong Kim at Purdue) that it was for reasons of military security; "they" are afraid that terrorists or rogue nations will learn how to make vest-pocket H-bombs (This is why physicist Fred Zimmerman of the US State Dept. is helping Park with his campaign to outlaw cold fusion meetings.).

When I replied to J that my own theory of deuterium crystals could be used to make "fusion micro-pellets" or "micro-bombs" and that I had sent a copy of my proposal to the Japanese government before they terminated their NHE program, J replied to me that I had better "keep your bright ideas to yourself".

In case I pass away prematurely of "natural causes" I am going to copy the preceding paragraph and send a copy to Gene Mallove and include below a copy of my "microbomb" proposal to the Japanese government. My MSD "bright idea" which J says I should keep to myself has been spread all over the world by Internet since late 1997. So it's too late to suppress the idea by suppressing me.

Best personal regards,
Bob

Dr. Bass is an unusually innovative physicist. Hot fusion requires millions of volts or the equivalent. Hal Fox's cold fusion apparatus requires almost 5,000 volts. Bass's process only takes 17.5 volts to ignite!

Bob Dratch: Thorium Powerpack

Bob Dratch's thorium powerpack would generate electricity at approximately one-tenth of the cost of current methods of producing electricity. Thorium is sufficiently abundant that the entire planet can be powered for millennia. After ten years of continuous operation, a trace amount of U-233 is produced. U-233 recovery to re-purify the thorium is easily accomplished. Thorium thus lasts a long time when recycled and consequently is a very efficient energy source. After extraction from ore, thorium does not require energy-intensive enrichment as is the case with uranium.

A thorium-powered reactor is inherently safe. It doesn't run the risk of "meltdown" or explosion nor can even a dirty bomb be created. Its nuclear reaction simply stops when its neutron exciter is turned off.

The simplest and smallest "table top-sized " neutron exciter design is something close to the size of a 4-D cell flashlight, and starts at about 500-kilovolt neutron output. In fact this smallest most cost-effective system can run off 4 D cells for its power.

A thorium powerpack's neutron excitor does not use radioactive flux components as conventionally done for portable systems. Instead it relies on Dratch's invention of a novel method of resonant phonon pair cleavage using specifically designed nuclear lattice holo-forms (holographic waveforms) to induce neutron imbalance in a host atom where the host atom then attempts to establish "balance" through the liberation of neutrons. Dratch demonstrated the first model of this novel design back in 1966.

Commercial thorium powerpacks can be developed with 50 or 100 kilowatts of output for home use, and up to 1 megawatt for industrial use. They actually are "power amplifiers" with power outputs of 60 times over input power. Maintenance would be minimal.

Predictably, Dratch complains of harassment and even death threats for nearly three decades. He and his family do not enjoy any peace or security, and the police and district attorneys are allowing the threats to continue. That is what really stinks. It seems like there is more than meets the eye behind the scenes going on.

The same death threats and suppression are applying to every piece of technology Dratch has been working on, not just the thorium system. The thorium system has the most impact he believes to the cartels. Dratch had one small section on cold-fusion, which he had published before Pons et al did theirs, and again it used properly shaped sonic fields to do the separation. The scanning system was the basis again for obtaining the proper waveform patterns.

Dratch supposes his problems appeared after he demonstrated his inventions at the Global Sciences Conference and during his workshops since the late 1980's. He has some ideas about who the perpetrators are on the international scene, but nothing really firm. It does tie into Russia and the Middle East. At one point during an early workshop there was a Chinese scientist attending, who worked for the Chinese government and identified himself as such.

To develop his driving patterns for the neutron generation function Dratch uses his scanning system which seemed to have been the initial crux of where the recent bout of suppression started (that was pioneered in 1985, developed by 1988, and in full use by 1990).

Dratch unfortunately has a few more stories about being harassed and death threatened to him and his family by stalkers trying to get proprietary technologies. One stalker has been arrested and taken off his property. The stalkers got away without being brought to justice. The courts instead wanted to cite Dratch in contempt for dare showing that the stalkers were harassing and threatening him. Since that time back in 1992 the same stalking has gone on; there has been email and phone harassment; and the DA's office and police don't do a thing.

Dratch writes about his technologies on his website http://www.bob-dratch.org. Among the topics Dratch covers are energy stuff, anti-gravity stuff and consciousness altering stuff.

The earliest suppression was when Dratch’s patent application was stolen out of the patent examiners’ room and handed off to cronies to develop and exploit. Dratch was the one who designed the equations and concept of the Global Positioning System (GPS) – that was back in the very early 1970's. As best as Dratch can determine the Department of Defense was who the information he submitted at the Patent Office was directed to. That loss and damages is insurmountable to him. He has proof that his equations which were submitted at that time during filing are the same equations used to this day for the GPS equation. Tracing the evolution of GPS will reveal all the parties involved if one can get past the suppression and cover-ups. It then went to a private professional working for the U.S. Government for their own version of the "patent" and assigned it back to the government. In the early 1970's Dratch was offered $150K by them to sell out to them. He refused saying this is worth billions. Little did he know it was worth trillions.

In the mid-1980's Dratch designed a bio-sensory system that seemed quite capable of sampling fields and generating data signatures making up that object scanned. He continued to evolve the technology. It took on many forms. In about early 2001, he was contacted by the U.S. Air Force to modify that system to locate underground unexploded ordinance. The USAF got at his expense about $180K worth of consulting and demonstrations doing a bench test showing that his technology would work. They promised a series of further steps leading to contracts. They then disappeared after they apparently felt they had enough "proof" that the concept works. Dratch subsequently was told that they had handed over the research he did to a professor in Denver who to this day still hasn't solved the missing pieces that they weren't able to figure out.

After having given a demonstration of the sensory technology in the early 1990's Dratch was stalked, harassed, and death threats were made to him and his family to the tune of "Give them the technology or else". At one point two of the stalkers came on his property armed with knives and were trying to either kill him or his family, to carry out their threat. The sheriff came and hauled them off. When the trial came up, the judge let them WALK out free with no penalty; just a slap saying don't bother Mr. Dratch again. The judge threatened Dratch with contempt of court for having even brought this to his attention. That was in 1992. Since then Dratch has been regularly harassed and continually threatened. The police still refuse to go after the stalker and threatener. They are using extortion now as the current level of threat. Dratch has been to the DA's office of two states, and been in contact with numbers of police officers to no avail. The threats and harassment continues to this day including making complaints to the phone company who do nothing to stop such when they use the telephones.

Over the last two years Dratch has been working to develop a very unique and powerful handheld and truck-mounted sensor capable of discovering "Saddam's weapons of mass destruction" as well as many other chemical and biological weapons systems. Providing assistance, a former military officer has tried to retrieve documents which were available to any contractor. But Dratch and the officer were prohibited as they aren't part of their crony system of preferred contractors. They needed specific signatures which the U.S. Government has on hand to calibrate their system to what it had to look for (the chemical agents). Having the signature isn't the formula, it is a roadmap that says contamination or a toxic situation is present. So troops and civilians are prevented from having Dratch's technology in a low-cost form.

After having spoken enough about the innovation, one of the crony groups has published that they have a working sensor based on the technology that Dratch had divulged to the former military officer, and that they are going to charge big bucks for that innovation. So that is suppression again of getting technologies out in a way where Dratch can carry out more work.

IPMS: Thorium-227 Electricity Generator

The I.N. Frantsevich Institute for Problems of Materials Science (IPMS), Kiev, Ukraine, from 1951 through 1991 secretly employed 6600 of the most brilliant theoretical physicists in the entire Soviet Union to work for nearly 50 years with complete freedom. They were able to develop whole new sciences, technologies and materials unknown in the West.

Their models of non-linear quantum mechanics, plasma physics, atomic engineering, nuclear physics and related mathematical and theoretical constructs, which made their development possible, are so unique that they challenge the validity of the most fundamental assumptions embodied in the Copenhagen Interpretation model currently held in general acceptance in the West.

For example, Western-developed particle/wave quantum mechanics is described by Einstein's $E = MC^2$. The Soviet nonlinear model of quantum mechanics is described by the formula $E = M_KV$ [Energy = Mass @ rest as a function of a mathematical constant].

Einstein's theory of relativity assumes that the speed of light is constant. However, measurements have shown that the speed of light has slowed down 7 per cent over the past two centuries. (See http://worldnetdaily.com/news/article.asp?ARTICLE_ID=39733.) Einstein's famous equation is therefore not based on the real world of peer-reviewed experimental results. Consequently the more correct Soviet model has enabled numerous technical advances not even dreamed of by Western science.

Among several energy inventions developed by the IPMS are free-standing thorium-227 isotope electric power generating plants. They can be small enough to power a single home and large enough to power whole communities. They also can operate for up to 18 years without ever requiring refueling or maintenance.

Arrangements to commercialize these useful energy inventions by joint ventures of the IPMS and more than a dozen private sector companies were repeatedly sabotaged by the U.S. Government's Defense Intelligence Agency and others. (Source: David G. Yurth, *The Anthropos Files: Tales of Quantum Physics from Another World – 2nd Edition*, 2007)

Howard Rory Johnson: Magnatron – Light-Activated Cold Fusion Magnetic Motor

During the late 1970's Howard Rory Johnson, a brilliant inventor in Elgin, Illinois, combined light-activated cold fusion with a new type of magnetic motor into a "Magnatron". His prototype Magnatron produced 525 horsepower but only weighed 475 pounds. It could propel a large truck or bus 100,000 miles on about 17 ounces of deuterium and 1.5 ounces of gallium before being recharged. This was years before either Pons and Fleischman or Dr. James Patterson entered the scene with their cold-fusion technology.

Johnson discovered the light-activated cold fusion portion of the Magnatron by accident when as he was developing a new type of electronic circuit using deuterium oxide and gallium, he noticed the two materials were producing energy on their own. He could not figure out what was triggering the energy production for some time until he finally discovered it was light.

The Magnatron's flow of deuterium (an isotope of hydrogen) is controlled by magnetic tunnels. At the point where the deuterium strikes the gallium (a heavy metal electron donor), a beam of light from a diffraction prism forces their fusion. That controlled reaction results in the fusion of two atoms forming a new atom. In the process, electricity is released, and that is what powers the magnetic motor. The Magnatron is sealed, however, so 'light' is provided from photon energy produced from coils tied directly to the motor. It is more or less a pulse-generated system.

A photon is a football-shaped particle of electromagnetic wave energy. Its energy content is a product of its frequency f and Planck's constant h. When an electron in orbit around the nucleus of an atom drops to a lower, less energetic orbit, a photon containing the energy equivalent to the electron's energy drop is emitted. This explains why light and other forms of electromagnetic energy such as gamma rays and radar are sometimes observed as particles and other times as waves. The heated filament of a light bulb is an example of photon production.

There is no way to explain, using contemporary electrical theory, how his relatively small motor could produce such tremendous horsepower. Utilizing his own new electrical-magnetic energy theory, involving a process he called "attract-attract", Johnson exploited the magnetic field. He used the top and bottom rotors in his motor. First, the top rotor attracted, released; then the bottom rotor attracted, released. The action of attraction, alternating between upper and lower magnets, used the windings to complete the attract field.

Robert Nelson's compilation of articles about the Magnatron provides much more technical detail on the Magnatron than the foregoing. (See http://www.rexresearch.com/magntron/magntron.htm.)

Johnson constructed his prototype Magnatron's 525-horsepower magnetic motor without any of the hardware that is presently used in present state-of-the-art electric motors. Conventional motors use the accepted principle of attract-repel, an energy form that doesn't utilize the magnetic field to its greatest advantage. For comparison, a typical 500-horsepower electric motor has wires exiting it that are the size of a garden hose.

The sealed self-contained Magnatron has no wires. Thus, other than the Magnatron's infrequent refueling with small amounts of deuterium and gallium, the stand-alone Magnatron uses no input power. The Magnatron's entire output power is conveyed by its magnetic motor's rotating shaft.

Fuel for the Magnatron is plentiful: deuterium is derived from water, and gallium is extracted from abundant aluminum bauxite. Commercially available pure gallium is still scarce and expensive. It may well be possible, however, to cheaply transmute another less expensive element into gallium. See Gary Vesperman's list of over two dozen methods of neutralizing radioactive waste in http://iiic.de/docs/GVComparison.htm which includes possible transmutation methods.

The Magnatron uses no fossil fuel in its operation, and it emits no pollution. The magnetic motor's RPM is 8,000 with a gear ratio of 2:1. Lubrication for the sealed motor is synthetic motor oil which does not need changing and does not need a filter, because foreign materials such as carbon and varnish are not introduced into the system, as they are in the internal combustion piston engine.

This writer, Gary Vesperman, attended the 3rd International Symposium on New Energy in Denver, CO (April 25-28, 1996). I remember being impressed by Gerald Orlowski"s lecture "Magnatron, Fusion Magnetic Motor", during which he provided substantial technical information on the Magnatron.

Orlowski reported that, "Some inside information revealed that OPEC had been keeping track of all competitive technology", and Johnson was #1 on their hit list! Johnson was about to manufacture the motors through a nationwide dealership. Some motors still exist, but the owner wants several million dollars for them."

This writer Gary Vesperman knows of very few inventions of new energy sources which are reasonably large stand-alone energy producers. Besides the Magnatron, they include Oleg Gritskevitch's hydromagnetic dynamo, and Electron Power Systems' micro-fusion reactor, which employs stable high-density plasma electron spiral toroids. Almost all inventions of new energy sources are, or claimed to be, relatively small over-unity power converters that convert input power to greater amounts of output power. Bob Dratch's thorium powerpack is an exception (see above).

At the September 14, 2005 public meeting in Green Valley Ranch casino regarding the proposed Regional Fixed Guideway traversing Las Vegas, Nevada, this writer Gary Vesperman submitted comments suggesting possible power sources for the train, including descriptions of the hydromagnetic dynamo and the micro-fusion reactor (http://www.rtcsouthernnevada.com/rfg/documents/September2005PublicMeetingMinutes.pdf, pp. 19-77).

No wonder the Magnatron's inventor, Rory Johnson, was rumored to have been "Number One" on Organization of Petroleum Exporting Countries (OPEC)'s hit list.

The following is an excerpt, slightly edited, from Orlowski's lecture transcript where he tells about his unwitting personal involvement with the U.S. Government's suppression of the Magnatron:

"After I saw the Magnatron motor, my life changed. I was no longer a happy camper working by myself in a wonderful, fully equipped research machine shop for the Greyhound/Armour Corporation in Arizona. While on a business trip, I saw this motor running in the Magnetron, Inc.'s showroom located in Eglin, Illinois.

"During my 15 years of electric motor repair, among the hundreds of motors I repaired, I rewound a 500 HP electric motor. That motor had wires exiting it that were the size of a garden hose. The Johnson motor being shown had NO wires. Surely this motor was unreal, a con-job to get money for dealerships. Yes, there he was, Rory Johnson standing next to his sealed self-contained electric motor.

"Upon returning to the Greyhound Towers and telling them what I had seen, they instructed me to call Mr. Johnson. Greyhound wanted Johnson to put forth a plan to install a motor in one of their buses for testing purposes.

"I called Johnson. He was delighted that a Greyhound employee had seen the motor running, and replied that the testing idea was acceptable. He would set a time frame for just when a bus should be delivered to him.

"Two years went by, with no business proposal from Johnson. Then, his former business partner, Mike Marzicola, called to say Johnson had passed away. He wanted me to work with him to get one of the motors running. I flew to Orange County, CA, saw the motor, took pictures, and put forth a plan to Greyhound. Subject to a contract with Marzicola, one of the old worn motors would be brought to the research shop. I would then very carefully reconnect the generator wires that Johnson had cut off prior to moving from Elgin, IL to California.

"Discussions with Marzicola brought out that the U.S. Government (given the authority by the Congress of 1952) had issued a GRAB order to take Johnson's motors. Rumor has it, the DOE is run by US oil companies and OPEC, and they want no competition, period. Because of this grab order, Johnson had cut the generator wires. He had then put his `total shop', with motors and all, on several U-Haul trucks and left Illinois in the middle of the night. He went to California to re-establish his business. But before he could get a motor running, he passed away.

"Surely, Greyhound would agree to let me re-start one of Johnson's motors. The wonderful proposal put forth to Greyhound was rejected by mail. Very agitated, I went to the top office at Greyhound demanding an explanation. I was met at the door with the comment, "We know why you are here." Knowing the potential savings to the bus company, surely they could have only one reason for rejecting the proposal. They must have believed I was not qualified to start up the motor.

"Greyhound's top legal advisor stated he was present when the Greyhound board met and discussed my written proposal. He stated the following, "At NO time was the thought put forth that you would not succeed. In fact, we discussed all of the hardware designed and constructed by you, and started the conversation from what happens when Greyhound has a running motor. We contacted a State representative who felt this motor should not be allowed to be used in 4,000+ buses. The loss in tax dollars for fuel alone would be a very huge sum." He then asked me to leave, stating he was sorry that he had to tell me the reason the plan was rejected.

"Telling Marzicola of the rejection, I offered to personally put in a few thousand dollars toward the parts to get one motor running. In return, I would be assigned the dealership for the Phoenix metropolitan area. We signed legal papers in exchange for the money agreed on, and went to work. (I still have the signed dealership.)

"The first thing I noticed was that someone had been working on repairing the motors. Three motors already had new commutator assemblies installed. Each assembly consisted of 3 commutator assemblies on one insulated tube with a metal case to secure it to the shaft.

"One motor still had the old worn commutator assembly, as it had not yet been repaired."

Orlowski goes on to describe his reconstruction efforts and includes interesting technical details about the Magnatron's structure and theory.

Johnson did not know that OPEC tracks all potential competition to its oil business and that he was reportedly number one on OPEC's hit list. His first mistake was publicizing, in many magazines, his plans to manufacture and distribute his revolutionary motor.

Erik Masen has spoken with a few people who even signed up for distributorships. Erik Masen had included Johnson and his Magnatron in his energy invention suppression anthology (see http://www.electrifyingtimes.com/erik_masen_suppression.html).

In 1979, Johnson placed his engine in a Buick Electra and was preparing to drive it around the country to sign up more distributorships when the US Department of Energy and the State of Illinois teamed up to prohibit his company Magnatron, Inc., from producing and selling Magnatrons. They first placed a gag order on all the people in the company by using the Secrecy Act of 1952. Secondly, the State of Illinois immediately requested the company to provide information about all of their employees, distributors, stockholders, investors, suppliers, etc. They asked questions that blatantly deny anyone's constitutional rights to privacy. The pressure from the State of Illinois became so overwhelming that Johnson decided to move his entire business to California in the middle of the night.

After a year of hearing nothing but silence from Johnson, Greyhound agents tried to contact him – only to be notified that he had passed away unexpectedly. This is a particularly troubling part of the story, since he had been in his early fifties and in robust health. Later, Greyhound learned that shortly before he died, Johnson had inexplicably moved out of his laboratory in the middle of the night and taken all of his motors and technology to California.

Bob Bass, in his report copied above on low-energy nuclear transmutation, claims that the CIA, the KGB and the Mossad, etc. all have "sprays" which can be sprayed upon someone and cause him or her to die of apparently natural causes. One speculation is that Johnson's death – apparently due to heart failure – had been artificially induced by such a spray.

In a January 20, 2007 email to Gary Vesperman, Terry Sisson reports:

"Hi Gary,

"I visited Magnatron, Inc., in July 1979. I wish I would have taken a photo. Placards were placed over every inch of the large windows in the front of the building listing all of the questions the State of Illinois requested his company to provide. He wrote, "When has the government ever had the right to ask this of any company." I peeked in the front window and saw one of his motors mounted on an engine stand. Nobody appeared to be there so I walked around to the rear of the building. I found the rear garage door open and could see the Buick Electra inside. I was about to approach nearer when a man emerged. We talked, but he quickly informed me that due to a US gag order he was unable to talk about anything. I managed to get his phone number and called him from time to time for years following. He was an assistant of Rory's and he kept the information very close to the vest. He did tell me that it was real and it worked, yet not how it worked.

"About 1984, I began to call all the Johnsons in the phone book in Elgin. I finally got a hold of Rory's son. He too said that it was real, but I got nowhere. Around 1992, I met Jerry Orlowski, and he told me his experience as the employee of Greyhound who was sent to investigate the technology, since he wound electric motors for several years. Jerry was very upset about the whole incident, particularly Greyhound's Board of Directors refusal to utilize the technology after he found the technology to be authentic. Jerry even witnessed the government's seizure of the motors in California. --- Terry Sisson."

Energy invention suppression-pertinent quotable comments from Johnson:

"There have been very few startling things that have come from a large organization. You don't get anything practical out of a government-sponsored laboratory such as Fermi and Argonne."

Johnson believes watching a budget as required by government-funded programs stifles creativity and the ability to take a chance.

The US Department of Energy (DOE) is termed a rip-off by Johnson. “Right now our government is not looking for energy in any form. A tremendous amount of money is spent (on DOE) every year and so far I haven’t seen anything out on the road or helping heat your home or helping reduce the cost of your utilities or anything else.” (For example, the DOE’s glamorous multi-billion-dollar hot fusion research program seems to be fundamentally a public relations ploy which allows the DOE’s numerous highly paid bureaucrats to have lots of fun making themselves look useful without posing any serious competition to the oil and power industries for at least decades, and may always be for decades. Gary Vesperman)

Howard R. Johnson: Permanent Magnet Motor

Howard R. Johnson has developed a device resembling an electric motor which produces work without electrical input, using only permanent magnets for motive force. The basic principle of his magnetic motor is that its magnets are arranged in such a manner that its magnetic flux is always unbalanced, thus producing a continuous rotational drive. For patent descriptions, detailed theories and diagrams, see http://rexresearch.com/johnson/1johnson.htm. Two links to additional information can be found in http://www.web-space.tv/free-energy/. More information apparently is available from the "Permanent Magnet Research Institute", P.O. Box 199, Blacksburg, Virginia 24063.

Johnson spent six years fighting the patent office to accept the reality of his magnetic motor. In April 24, 1979 Johnson finally got a US patent – 4,151,431 – for a Permanent Magnet Motor that starts itself and would deliver 5 kilowatts from permanent magnets. Jet Propulsion Labs built a prototype 5-kilowatt generator.

In his January 20, 2007 email to the New Energy Congress, Ken Rauen reported:

Howard Johnson got his patent because he DEMONSTRATED one in the courtroom. The judge ordered the USPTO to give him a patent. I saw a copy of the court document while in Gene Mallove's employment. Unfortunately, the whereabouts of that document is unknown, as Gene was not a good file keeper, and he is not around any more.

What was demonstrated was a roller skate on a linear track, fitted with magnets, and a line of magnets over the tracks. The track was slightly sloped up, so gravity could not be attributed for the motion. Since it flew off the track end and was not jerked back, it had to have net energy imparted to it.

Ken Rauen

That demonstration looks similar to the prototype of Stewart Harris’ theory of magnetic instability (see below).

Johnson’s other two patents are No. 4,877,983 for Magnetic Force Generating Method and Apparatus, and No. 5,402,021 for a Magnetic Propulsion System. In all Johnson is connected with more than 30 patents in the fields of chemistry and physics.

The following suppression account is an edited consolidation of information from an exchange of emails between Gary Vesperman and Al Witherspoon, a long-time associate of Howard Johnson. June 2006 Al had read on the Internet Vesperman’s third version of this compilation (now in its fourth version) of energy invention suppression cases and had then emailed Vesperman. Al is a businessman and the inventor, in one week, of a crucial part of the Hubble Space Telescope that had stymied other engineers for months.

To refresh memories for Al’s story, Al and Howard had some pleasant visits August through October 2006. Howard is now 92 years old but still healthy with a keen memory.

Al’s involvement with Howard’s project was not from a technical standpoint but rather from the standpoint of technology suppression. Al had never taken the time to write this up. He thinks that it's about time. Al has been holding back his suppression story for nearly thirty years.

Howard Johnson actually began his work on this motor in the 1930's. When he first started the project and conceived the idea on paper, the materials needed for the construction of the motor had not yet come into existence. However, he told Al that he knew that someday they would become available, and then he would be able to construct it.

The suppression of the motor is occurring by the general methods in addition to Howard's own suppression due to his warranted mistrust of fellow scientists. Things have come up missing and promises not kept.

When Howard first introduced the development of his permanent magnet motor there was a nearly immediate world symposium organized and held at Virginia Polytechnic Institute and State University. A number of scientists came from all over the world to attend this event. There was quite a buzz in the air about this new technology prior and existing through some finite time during the event. Al met and conversed with a number of them. A couple of them were actually quite friendly. The rest were seething with egomania and the disinterest of speaking to whom they assumed was a local hillbilly.

It was not a conference. It was merely a one-sided presentation of the technology and there was no entertainment of questions. The rules of the event were such that questions were to be saved for the end of the presentation. At the end of this presentation, the speakers quickly vanished at the moment of the last word. A couple of questions were addressed, but the respective replies were only "I don't know" or "I cannot say at the present time".

The primary focus seemed to be entirely that of debunking the notion of such a device. There was absolutely no positive attitude in the air with the exception of a few attendees who expressed the hope for the further investigation and development of the technology. Most attendees were nearly laughing with skepticism. One who Al spoke with was emphatic with his opinion that the device was viable.

Al recorded the event on audio, but there seems to be no record of it now. Al does not know what Howard did with it. When Al visited him summer of 2006 he could not remember the specifics of the tape or where it might be located at the present time.

Also at the symposium there were a couple of people making an apparently 'approved' video tape of the presentation. There were no other apparent attempts to videotape the event.

Al was the last of the attendees to exit the event. He watched what was done with the video tape.

A man took the video tape downstairs and then discretely gave it to another man. This 'other' man then went to his car and drove away. Al followed him until he arrived at Inland Motors Division of Kollmorgan Corporation in Radford, VA where precision drive motors and systems are manufactured. He got out of his car and went into the building.

Al asked the guard if he knew this man and he said that he was not an employee but was a U.S. Government inspector from Washington, DC. From this point on there is no more information about the identity or the purpose of his actions.

Some months later Al confronted the directors of the symposium. Their words to him were such that they had apparently reconsidered their position of belief concerning the technology. A little later Al found that these directors were under the direct employ of Kollmorgan and also by virtue of the fact that they stood to receive sizeable renewal grants for their respective departments.

Do you suppose that it was Kollmorgan who wanted the technology to be suppressed? After all, they stood to gain by creating disinterest such that they could quietly and anonymously pursue it for their own use without the threat of competition.

A couple of weeks later the house across the street from Howard's house which had housed a few of the working class became occupied by two agents from the National Security Agency. Al acquired the nature of their identity by unusual means. Besides this, they stuck out like a sore thumb, dressed similarly to Mormon missionaries but older in stature. They stayed there for about one year. Periodically Al went by there to see what they were up to but only saw them outside once.

They likely saw Al at Howard's place on numerous occasions but never spoke to Al and reportedly spoke to Howard only once. The nature of the conversation that Howard had with them supposedly had nothing to do with technology but was apparently just everyday common chit chat.

Al wondered what they did all day. He got to thinking that they probably sat around doing what all government officials do, smoking dope without exhaling while watching cartoons without exhaling. Please overlook Al's slight humor.

Then one day they were simply GONE. Al asked the owner of the property who they were. He said that they were Electrolux vacuum cleaner salesmen. Al almost busted out laughing. Al's great uncle was one, and Al has seen several at his front door, but never those that dressed like these guys.

During their stay Al received a rather strange phone call one day in April 1979. A man simply asked for Al, and Al simply said hello, thinking that it was likely one of his customers or a telemarketer.

He quickly identified himself in such a way that Al could not understand his name. When Al asked who was calling he simply replied by asking Al if Al was acquainted with Howard and how long. He was very nice and thus Al answered him due to Al's probable youthful naivety. He then simply said "Thank you" and hung up. Caller ID or the *69 features were not available yet at that time.

On three occasions after this between 1980 and 1983 Al's house was broken into in a nondestructive and undetectable manner, meaning that the method of entry was not discernable as being unauthorized. However it was very apparent that someone had been rummaging through the house in ALL the rooms including the garage and basement. No valuables were ever taken. At the time there was some jewelry, other precious stones, silver, gold and a letter from Robert E. Lee in relatively plain view which at that time were valued well over $100,000. These were likewise never touched. Since then these items have been removed to a safety deposit box.

Whoever broke in never found any devices or related documentation. However, Howard's house, as far as Al knows, was never invaded until early 2006. Al and Howard have no idea who did this, but there were no prints to be found. They only took documentation which had nothing to do with the technical aspects of the motor or its design. The documents were related to contractual agreements concerning the disclosure of the technology.

In 1985 Howard reported to Al that he had struck a deal with General Electric. For fifteen million dollars the company had purchased an exclusive (but not 'sole') license to make, manufacture, market and utilize the motor. By 1986 General Electric had built a very, very large working model the size of a house. It is not being used and is kept hidden in a building under armed guard somewhere in the United States. (However, it doesn't quite make sense that the company would build such a very expensive large motor when a much smaller, cheaper motor should be adequate for experimental studies. Gary Vesperman)

Al never asked Howard what he did with the proceeds. A reliable source did tell Al that the agreement with General Electric was such that they give the $15 million to a certain charity.

Since that time there has been no other publicly known activity with the motor by General Electric. Al suspects that the company is using it to get paid by the oil industry to keep it under wraps – industrial/technological extortion or protecting the world, or possibly both. However, this notion is merely a notion and surely speculative.

Al's guess is that General Electric could simply and easily make a substantial amount of money by keeping things quiet while at the same time using it as a card to play when the time is right. Al knows exactly how they could do such.

Howard and Al have found that American and Japanese magnet manufacturers are mysteriously very reluctant to provide the needed magnets. In the report below on "Yasunori Takahashi: Magnetic Wankel Motor" John Moreland explained that the secret to the enormous strength of the Takahashi magnets, at 25,000 gauss the most powerful magnets ever developed, is that they contain uranium. The U.S. Government forbids importing radioactive materials.

Throughout the past twenty-eight years approximately, there have been some reported attempts to construct the motor. Al has NEVER seen one in the possession of any individual outside of the Permanent Magnet Research Institute.

Finally: Howard, by claim and Al's personal opinion, has sufficiently disseminated the technology to the point such that the motor can be replicated. Replication of the motor has apparently achieved little known success. There are reasons for this lack of success.

There seems to be little doubt that this device or similar devices have been built. They are relatively easy to build and do not require any sort of special magnet type in order to be functional. Actually, ordinary magnets are better from the standpoint of the homebrew versions. Very powerful magnets are difficult to keep seated in place. Also, experimenting with super-strong rare-earth magnets without special equipment and training can easily cause injury.

The notions that are reflected in comments made by others as to the theory of operation are not correct by any means. The energy required to charge the magnets have nothing to do with the energy delivered by the motor. Many would say that this is most interesting and important.

Al has found, in the process of examining various cases, that few individuals if any, have the correct blueprints. Also, the blueprints are not a whole lot of help unless a person has a clear understanding of certain principles of magnetism. Though this motor can be successfully constructed with "off-the-shelf" components and not to mention being done so in a crude fashion, the apparently ability of most is not sufficient to attain a working model of the rotary motor.

Al has seen theoretical speculation concerning certain magnetic principles by "respected" members of the HJ Motor Group that further suppress the successful application of the technology. Though likely not intentional it is nevertheless the result of careless thinking and poor technological vocabulary. Such practices propagate inaccuracy and inability to produce any viable results and end up merely creating a vicious circle resulting in lost art and the downward spiral of success.

Al discussed this matter with Howard during one of their visits. They were able to arrive at some conclusion perhaps, but that of which will not presently be disclosed. Al needs to think about it a little more.

As far as participation by other individuals:

To date, there has been no person that has kept their word concerning certain aspects of disclosure. There have been no individuals that have kept up other agreements directly related to the use and dissemination of the technology. Some individuals have replicated Howard's research in various ways, including the distribution for gain, in such a manner as to claim it as being of their own origination. This may include the distribution of nonfunctional blueprints. As far as Al knows, Howard has only and repeatedly been the victim of greed and egotistical lust.

To date, not one single person has ever commented on Al's advice for making the motor work. This show of apparent ignorance eludes Al's belief.

At this point in time Al does not believe that Howard is highly inclined to divulge any more information to the general public or prospective co-participants. The royalties due on his recent book have not been paid either. This situation will change with the publication of his new book containing advanced theory. Those who have any sense, in my opinion, will be well advised to read it.

And as for Al himself: He is presently looking for a few good men. To date Al has only been in contact with one or two individuals who have shown even a spark of integrity. At the present time, there are only two individuals actively involved with the Permanent Magnet Research Institute.

Howard's parting and publishable comment from their meeting of October 10th was simply as follows and quite closely matches his exact words: "If you can't believe what you see, then there is little else that I can do for you."

Al thinks that it's not always the government that suppresses technology. Sometimes it's the individual who bites off his or her own nose to spite his or her face. That is, the government does not need to directly suppress the technology because the citizens are doing a splendid job all by themselves.

However, it should be noted that it is plausible that negative elements hide behind the veil of our good society WHO serve the purpose of being suppressing agents.

It is not necessarily our government which doles out the suppression. They often get blamed for a lot of things which are merely the bad direction of a small individual or group within.

Maybe the distribution of incorrect information is being done by the implant of a suppressing agent(s)?

Virginia Polytechnic Institute and State University does not help Howard though he lectured there for a while. Most of the technologists there are quite jealous of Howard and for whatever reasons seem to be a major contributing factor to the suppression of the technology. The college is where the first world symposium took place. Al was sent there to eavesdrop and record the presentation which was largely an attempt to discredit his work. Al spoke with some of the scientists who attended the symposium. Most were quite skeptical, both about the technology and the true intentions of the lecturers. Some even left in laughter. There were a few who expressed that they sincerely hoped that the technology would come to perform, regardless of any negative opinions.

However, this apparent suppression may have been done with Howard's ultimate blessing since such a discrediting would likely draw attention away from his work yet get the ball rolling for world curiosity and open some minds. Making money at this sort of thing was a hopeful wish for Howard since he is by no means a wealthy man. Aside from this he just wanted to help the world. He reminded Al, however, that not all good things are good for mankind and that the introduction of such technology to the world would indeed be disruptive. After considering his comments over a period of nearly thirty years, Al has come to realize that Howard's concerns may warrant some serious consideration.

Al intends to see Howard again sometime to find out by some gentle fashion if this early suppression indeed was his intention, or if it simply occurred inadvertently. Also Al plans to find out whatever else he can since time is short and Howard, being 92 years old, may not be here for very much longer.

As mentioned above, this account of Al's suppression story is a consolidation of emails exchanged between this writer, Gary Vesperman, and Al Witherspoon up until mid-October 2006. However, I have emailed Al a few more questions. But since then I haven't been able to contact Al by phone and email.

For instance, it is not clear to me whether the two National Security Agency agents had rented a house across the street from Al's house or Howard's house. How were they able to still acquire needed magnets which they weren't allowed to buy? Exactly what did happen at Oak Ridge and Howard's involvement in the development of the atom bomb? What were the real reason and circumstances relating to the Science and Mechanics article? What happened in 1941 at the U.S. Patent Office 37 years before Howard actually commenced construction? What are the details regarding the construction of the generator at Jet Propulsion Labs? What's this about snowflakes and honeybees?

Stewart Harris: Theory of Magnetic Instability

The theory of magnetic instability is a magnetic principle which appears to be the embryo of a valid free energy device. It was invented by Stewart Harris. He applied for a patent in 1978, and it was rejected. Dr. Marion Bowman from Washington, DC traveled out to Mr. Harris' home in Las Vegas, Nevada to witness the operation of the device. He was impressed and returned to Washington enthusiastic about its applications.

Shortly after the demonstration, all copies of the patent application and other information subsequently disappeared from the US Patent Office in Washington, DC. In addition, Mr. Harris' home was broken into and his original drawings, papers, applications, and correspondence were stolen. For some unknown reason, they left behind the prototype. Coincidentally, Mr. Harris lives just a few blocks from the office of Film Funding, Inc., where this writer, Gary Vesperman, used to work in Las Vegas.

For some time I had Harris' prototype on my desk which I delighted in demonstrating to visitors. A horizontal three-inch-long roller cylinder of about five stacked 1-inch diameter disk-shaped magnets rolls UPHILL, without energy input, between two similar four-inch-long cylinders of about ten stacked 1-inch disk magnets placed in parallel with each other and taped onto a cardboard ramp (try 30 degrees up from the horizontal).

Radio Shack sells disk magnets, but they are a little too strong. The horizontal cylinder rolls uphill a little too fast. Try weak disk magnets instead, or strong magnets that are made weaker by thermal or mechanical shock.

I had noticed while playing with Harris' device that the roller cylinder would hang up at the top of the incline. But if the cylinder was immediately picked up and placed back at the bottom of the incline within 60 seconds, it would accumulate enough additional rotational angular momentum of unknown origin to fall over the top of the incline.

At the International Symposium on New Energy that was held in the Denver Hilton South, Denver, CO (25 – 28 April 1996), I asked Dr. Harold Aspden if his "Aspden effect" is the same as the roller cylinder's temporary accumulation of additional rotational angular momentum. He said it is not. However, Aspden and I decided that it appears to be such an interesting etheric energy phenomenon it should be investigated further.

This is what would make a fine project for a grade school science class: Try magnetic disks of various sizes and strength. For each particular size/strength, carefully record various time delays between the time the rolling cylinder is taken off the top of the incline and placed at the bottom of incline. There might be some type of "half-life" whereby the roller cylinder's residual additional rotational angular momentum decays with time until the roller cylinder hangs up again at the top of the ramp.

Lester J. Hendershot: Hendershot Magnetic Motor

During the late 1920's Lester J. Hendershot, while working on a new type of aviation compass, stumbled across a method of generating energy. The "Hendershot magnetic motor" made headlines and attracted such big name investors as Charles Lindberg. Hendershot, while attempting to establish a true magnetic north compass, found that by cutting the same line of magnetic force north and south, he had an indicator of the true north and that by cutting the magnetic field east and west, he could develop a rotary motion. He wove together a number of flat coils of wire and placed stainless steel rings, sticks of carbon and permanent magnets in various positions as an experiment. Based on this principle, after two years of trial and error, he built a magnetic motor that would self-rotate, to his surprise, at a constant speed of 1800 rpm while producing 45 horsepower.

Hendershot changed directions and decided to build a generator on the same principle, after deducing that a magnetically-powered motor was not as practical as a magnetically-powered generator. Hendershot had discovered that the Earth's rotating magnetic field could be used to provide power to motors and generators, much like Nikola Tesla's discovery that the Earth was a huge capacitor, capable of providing significant amounts of electrical power. Simplified, Hendershot believed that if one were to cut the lines of force of the Earth's magnetic field, one could harness this to provide direct power to generators and motors. Nikola Tesla attempted to do just that, when he built his "magnifying transformer" at Shoreham, Long Island, NY.

To read the first hand accounts of Hendershot's historical encounters, see the following research links:

http://www.time.com/time/magazine/article/0,9171,880984,00.html
https://secure.netsolhost.com/nuenergy.org/alt/RadonFuel.htm
http://www.clubusenet.com/thread/262719.html
http://www.borderlands.com/freeenergy.htm
http://www-tech.mit.edu/archives/VOL_048/TECH_V048_S0041_P004.pdf
http://www.clarabow.net/articles/ourreaderswrite.html
http://www.freepatentsonline.com/20070007844.html
http://www.rexresearch.com/feg/feg1.htm#hendershot

Hendershot ran into political difficulties in promoting his device, attempted to take his business to Mexico, and finally faded into obscurity having taken a "couldn't refuse" payoff to never work on his device again. (Source: http://www.ssrsi.org/sr2/Heat/fed.htm)

In 1961 Dr. Ed Skilling, from Columbia University, successfully replicated and tested a Hendershot free energy device, out of which he got 300 watts. Skilling had been associated with Hendershot and learned of the device through him. The generator was self-resonant at 500 kHz.

James Watson: 8-Kilowatt Battery-Popper Motor

Thomas E. Bearden, Ph.D., has provided a significant 'account', dated 1999, regarding James Watson located at http://www.cheniere.org/misc/battery%20poppers.htm, copied as follows with some editing:

James Watson successfully replicated Bedini's battery energizer (with direct advice from Bedini). Watson made improvements and modifications, and eventually was able to build one and adjust it as he wished. He demonstrated an 8-kilowatt battery-popper motor at the first International Tesla conference in Colorado Springs in 1984.

Later Watson was moving toward development and marketing.

Then Watson and his entire family disappeared. Neither Bedini nor I could locate him. Neither could his financial backer, the late R. J. Reynolds III. This was a researcher and friend whom I was in contact with several times a week. Then bingo! Nothing further.

He [Jim Watson] abruptly and completely broke off all communication with everyone. A squirrelly message was left on his answering machine for a few days, saying he had moved (but not in Jim's voice). Then it too was removed. And that was that.

Eerily, it seems that if you call the police in the town where Jim Watson lived, they will tell you he still lives there on the same street in the same house. At least that's what they told a friend of mine who checked a few months ago, which is years after Jim and his family originally disappeared. And that check may be the oddest thing of all. The police implied on the phone that Jim and his family never disappeared. Everything fine. A-OK. And that's a bald-faced lie. He and his family did disappear. No one could find them, regardless of how they tried. His financial backer couldn't even find him.

The clear implication is, stay away from that one. Somebody "from the dark side" may have made Jim the "offer he could not refuse". One may never know what really happened, whether or not Jim ever surfaces again — or has already surfaced again and is living there very, very quietly. But Jim's entire over-unity motor effort ended abruptly, even though highly successful. And even though the motor was almost ready to be put into production.

Watson has not been seen at an energy conference since that sudden mysterious disappearance. No one has had a phone call from him. I have not found anyone I trust who has seen him again.

You have not seen a Watson over-unity power system go to market. You almost certainly never will.

Yet Watson's device was perfected to the point where he could make the things like pretzels, adjust them readily, and they worked every time. They could have been put into mass production very easily. Obviously that made him a grave threat to the energy cartels around the world.

At rare intervals, the energy cartel does suppress an invention and an inventor by making the inventor "an offer he cannot refuse", in Mafia terms. Presently the going price when that offer is made is $10 million. You take your $10 million, quit all research, quit your contacts, and you live. But you live very quietly, although you live very well financially.

The engineers who measured Watson's 8-kilowatt machine there in Colorado Springs are still alive. And they know what they measured.

There's one other little thing. At that same International Tesla Conference in Colorado Springs, the folks who were in charge (for the energy barons) of suppressing all successful over-unity devices in the Western world were also there when Watson demonstrated his 8-kilowatt device. There is a certain effect which happens in a battery sometimes for a large over-unity battery popper unit like that, if the device is "for real". Time-reversal operations and wave transductions can occur, resulting in time-excitation charging inside the battery materials, in a negative time charge sense (remember, the over-unity operation is a negentropic operation). After a machine of that type and with that particular internal effects has been used to furnish energy for quite a while, you can make a definitive test on it. Simply hook it to a normal battery charger for that size battery, and start to charge it. You then may find to your surprise that the power will just seem to "disappear" in that battery, without charging the needle one iota, for 16 to 48 hours or longer, and in a rare case for two weeks.

The reason is that wave transduction occurs of your charging spatial energy into time-energy, and so you have to furnish rather enormous energy to get a little bit of that negative-time charge reversed. After you fill that seemingly "bottomless pit", then suddenly the negative time-charge will have been eliminated, and at that point the battery will start to charge up in quite normal fashion.

It is significant that Watson’s battery was stolen right out of the machine. Whoever did it, almost certainly knew how to test it to find out if Watson's generator was actually a true over-unity device. If so, then they tested it and found that indeed it was genuine.

And there was only one group there who would have known that little tidbit.

Hitachi Magnetics Corporation: Magnet Motor

Engineers at Hitachi Magnetics Corporation have come right out and claimed that a motor run by magnets is feasible and logical, but the politics of the matter make it impossible for them to pursue developing a magnet motor or any device that would compete with the energy cartels.

Among the obstacles to free energy are the big banks who own or finance the energy industries. Peter Lindemann, D. Sc., offers an analysis of these obstacles in http://www.wanttoknow.info/newenergysources or http://www.spiritofmaat.com/archive/feb2/lindemnn.htm. Lindemann suggests that the four forces suppressing new energy devices are the world's wealthiest families and their banking institutions, national governments striving to preserve national security, deluded inventors and con men, and the unspiritually motivated behavior of all the rest of us.

Floyd Sweet: Vacuum Triode Amplifier

Floyd Sweet had invented an advanced, solid-state, magnetic power converter called the "vacuum triode amplifier". If it could somehow be made stable over a long duration, it potentially offers an exceptionally high ratio of output power to input power in the range of one million. The somewhat unconventional physics of the device is explained in http://rexresearch.com/sweet/1nothing.htm. The site also describes efforts to suppress Sweet's research and development efforts:

Two people from Australia, who claimed they wanted to help Floyd, stole his notebook and promptly asked John Bedini for help in replicating the VTA based on the notebook contents. John recognized the notebook as belonging to Floyd and promptly asked them to leave. However, the notebook was never recovered.

Sweet received many death threats over the phone and some threats face to face. A well-dressed gentleman in an expensive suit, tie, hat, and hundred-dollar shoes approached Sweet on the sidewalk of the street where he lived and introduced himself as Cecil Brown. Brown showed Sweet a photograph of Sweet inside his apartment. Brown then told Sweet that he represented a conglomerate that did not want Sweet's device to appear in the world at this time. Brown further stated that sometimes unfortunate things happen to people who do not comply with the wishes of others. Brown then retrieved the picture and departed.

Gary Vesperman's file titled "Bearden web site on electrical energy" includes these three excerpts written by Tom Bearden:

"A particularly good higher group symmetry electrodynamics, in this author's opinion, is the O(3) electrodynamics founded by Evans and Vigier and further expounded by Evans {[xxxviii]}. Evans has shown that O(3) electrodynamics is a part of the Sachs unified field theory electrodynamics {[xxxix]}.

Thus O(3) electrodynamics can be used not only for modeling "normal" electrodynamic but also for modeling "exotic" unified field theory. Further, it can be used for engineering, so it permits the development of a drastically extended electromagnetic technology which can eventually engineer many new phenomena {[xl]}, including anti-gravitational effects {[xli]}. At least one highly successful antigravity experiment was performed by Sweet, in an experiment designed by the present author {[xlii]}. The weight of an object was steadily reduced by 90%, on the laboratory bench."

"Sweet was fired at from about 300 yards by a would-be assassin, using a silenced rifle. Being old, he stumbled and fell on the steps just as the assassin pulled the trigger. The bullet snapped right by his ear, where his head had just been. Thereafter, Sweet was always deeply paranoid about taking the unit outside his own apartment or continuing to develop it. I personally worked with Sweet for some years." (End of Bearden's report) Dr. Bearden provides more details on Sweet's interesting device in http://peswiki.com/index.php/Site:LRP:Tom_Bearden_Remembers_Walter_Rosenthal_%26_Floyd_Swee t.

John Bedini: 'School Girl' Motor and Battery Energizer

John Bedini, Idaho, designed the 'school girl' motor and battery energizer. Some years ago, three thugs came to his home and beat him severely. For a time he went underground and retracted all information on his devices. See http://www.icehouse.net/john34/bedinibearden.html.

Two Inventors: Model T Ford Generator with Magnets Added

About ten years ago, two very clever backyard inventors took a magnetic, electricity-generating flywheel off a Model T Ford, attached stationary magnets in a spiral arrangement to the outside, and developed a self-generating motor-generator, using the pulsed varying distance magnetic spiral principle. This generator continually produced 1600 watts of power with no other input. They demonstrated their generator at UCLA – confounding the professors, students and other observers.

Evidently some heavy-handed U.S. Government/corporate types were in the audience, however, because the inventors never made it home from their demonstration. They were found dead along the highway. Their trailer, containing the generator, had disappeared.

Apparently the Japanese now have the technology, which they are calling the "Magnetic Wankel'" motor. (Excerpted with permission from Erik Masen's article "SUPPRESSION FROM HIGHER UP Inventors Beware! The Deadly Campaign Against Free-Energy Devices", *Electrifying Times*, Vol. 8 No. 3, and also in http://www.electrifyingtimes.com/erik_masen_suppression.html.)

Yasunori Takahashi: Magnetic Wankel Motor

Yasunori Takahashi, the famous Japanese inventor who developed the Beta video cassette recorder, has retrofitted his newly developed, super-powerful "YT" magnets into his 15-horsepower Magnetic Wankel motor scooter, claiming he can obtain 15 horsepower from a few amperes of electricity. If the U.S. Government allows the Japanese to export these scooters to America, we will see a further trade deficit in Japan's favor.

Rumor has it, however, that the U.S. Government refused entry to the Magnetic Wankel motor (in Mazda vehicles) several years ago, just as it blocked Honda's super-high-mileage, gas-powered cars at about the same time. Such protectionism may be "good for business" (at least for the oil companies and domestic auto manufacturers), but it hurts others and punishes the environment. (Excerpted with permission from Erik Masen's article "SUPPRESSION FROM HIGHER UP Inventors Beware! The Deadly Campaign Against Free-energy Devices", *Electrifying Times*, Vol. 8 No. 3 and also in http://www.electrifyingtimes.com/erik_masen_suppression.html.)

At the 1997 International Tesla Society Symposium in Colorado Springs, Colorado, John W. Moreland, Ph.D., a health physicist, lectured on his experiments with radiovoltaic electrical generators. (Compare with photovoltaic generators such as solar panels.)

Paul Brown lectured separately on similar work based on converting cosmic rays to electricity. Brown had been working mainly to recreate T. Henry Moray's generator.

Brown and Moreland found a strange quirk of ether physics involved with their over-unity electricity generating devices. It had been assumed by many, including Gary Vesperman as the basis for his advanced self-powered electric vehicle concept, that part of the output can be picked off and fed back directly to the input. The longest Moreland has been able to get his generator to run is three weeks. Then the generator dissipates like a cat getting tired of chasing its tail.

Brown and Moreland were still experimenting with voltage splitting, etc. Moreland said they may eventually have to take a generator's input and output out of the same time domain. For example, simply connect separate batteries to a generator's input and output.

After talking with Moreland this writer, Gary Vesperman, got to thinking that for the self-powered electric vehicle, we could have a computer monitor battery charge levels and from time to time switch around between several sets of batteries. Simultaneously at all times, one battery set is being used for the motor, another set for the generator input, a third discharged set connected to the generator's output, plus possibly some spare batteries.

When chatting with Moreland about electric vehicles, I mentioned the Takahashi over-unity motor mystery. June 1997 Hal Fox had sent me a copy of a 10-minute video showing Takahashi demonstrating his prototype over-unity magnetic motor, also known as a Self-Generating Motor (Magnetic Wankel) with a drive belt turning an alternator. The motor is shown connected to a battery for starting the motor, and the battery is then shown disconnected. Two headlights, connected to the alternator's output terminals, remained illuminated after the battery was disconnected.

A motorbike using the Takahashi over-unity motor was sent in 1996 (?) from Japan to England and then to Mark Goldes in Sebastapol, California for testing. Goldes found that the motorbike had limited range, and the magnets were unremarkable. Nobody could understand why a man of Takahashi's stature and wealth would try to pull a scam.

Moreland explained that the secret to the enormous strength of the Takahashi magnets, at 25,000 gauss the most powerful magnets ever developed, is that they contain uranium. The U.S. Government forbids importing radioactive materials. For some reason, the radioactivity of the Takahashi magnets is being kept secret from the U.S. Patent Office until the Takahashi motor patents have been granted. So Takahashi had to substitute ordinary magnets for his super magnets in his motorbike motor.

Thomas E. Bearden, Ph.D., understands that Takahashi's magnetic Wankel motor has been suppressed by the Japanese Yakuza mob. (Source: http://peswiki.com/index.php/Site:LRP:Suppression:_Alternative_Energy_Systems:_%E2%80%9CNovelty_of_Fact%E2%80%9D_Freely_Derived_Sources)

This writer, Gary Vesperman, didn't follow Moreland's explanation during his Symposium lecture how certain radioactive materials can enhance the magnetic field strength of a magnetic material. I had planned to write him for a reference that I could study. Unfortunately I lost touch with Moreland afterwards – mainly because his web site www.aztecpub.com never was active.

Teruo Kawai: Motive Power Generating Device

The key statement of Teruo Kawai's US Patent 5,436,518 for his "Motive Power Generating Device" is as follows: "Electric power of 19.55 watts was applied to the electromagnets at 17 volts and 1.15 amperes. … an output of 62.16 watt was obtained." Dividing the output power by the input power yields a coefficient of performance of 3.19.

Thomas E. Bearden, Ph.D., explained the Kawai device's operation, placed his explanation on the Internet, and Kawai and party came to Huntsville, Alabama to see him and his associates. At Kawai's urging, they negotiated an agreement with him that they would manufacture and market his systems worldwide; he already had build a closed-loop, self-powering system in Japan. Kawai would fund the entire project.

Their agreement was verbally reached on a Thursday afternoon, late. That night a jet arrived posthaste from Los Angeles, with a Yakuza on board. The next morning Kawai and his party were in fear and trembling, and the Yakuza was in total control. Kawai no longer controlled his own company, his invention, or his own fate. Needless to say, the Yakuza coldly cancelled the agreement, point blank. This happened in front of Bearden and four associates. So there are five witnesses. The Yakuza and party quickly packed up the two Kawai engines that were in the possession of Dr. Bearden and his associates, and departed. No Kawai engine will ever be permitted on the world market. Several other Japanese COP>1.0 electrical power systems have also been suppressed by the Yakuza. Many such incidents — including murder — have occurred over the last decades, right here in the United States. Others will happen. (Source: http://www.spiritofmaat.com/archive/mar2/bearden.htm)

Dr. Bearden, inventor of the Motionless Electromagnetic Generator (see above), himself has been the subject of suppression efforts, including death threats. (Source: http://peswiki.com/index.php/Site:LRP:Suppression:_Alternative_Energy_Systems:_%E2%80%9CNovelty_of_Fact%E2%80%9D_Freely_Derived_Sources)

Johan Grander: Magnetic Motor

Johan Grander of Austria developed a revolutionary magnetic motor, but was turned down by the Austrian patent office with the excuse: Inventions which are detrimental to products in existence may not be granted a patent." (Erik Masen, "Suppression of Quantum Leap Inventors", *Electrifying Times*, 2007, Vol. 10, No. 2)

IPMS-Kiev and Arzamas-16: Super Magnets

The evolution of the Soviet view of the material world was reflected in the formulation of a new model of nonlinear quantum mechanics as an implicit function of consciousness. For instance, water is more than just H_20. Experiments prove water can be affected in measurable ways by subtle influences such as music or whether a person's thoughts are hate-filled or life-enhancing. A more correct understanding of materials has thus enabled super magnets to be developed.

In conjunction with research jointly conducted at the highly secretive laboratories at Arzamas-16 in Khazakstan, IPMS-Kiev has developed a family of magnets with energy characteristics equal to or exceeding those of the best conventional iron-boron-neodymium types, but with the all-important feature that they operate with equal or greater efficiency at extremely high temperatures, up to 250 degrees centigrade. These magnets are so powerful that they have been successfully used to conduct extensive research in a perpetual zero gravity environment. All these experiments have been performed without the use of cryogenics.

Joint ventures of the IPMS with more than a dozen private sector companies to develop inventions were repeatedly sabotaged by the U.S. Government's Defense Intelligence Agency and others. (Source: David G. Yurth, *The Anthropos Files: Tales of Quantum Physics from Another World – 2nd Edition*, 2007)

General Motors Corporation: EV-1 Electric Car

Rodger M. Ward was a two-time winner of the Indianapolis 500, National Stock Car Champion, and multiple winner of the USAC Racing Championship. In 1993 Ward registered with the State of Nevada a Small Corporate Offering Registration (SCOR) for his American Electric Car Company, Inc., whereby 200,000 shares of common stock were offered for sale at $5 per share. This writer, Gary Vesperman, wrote most of the SCOR's disclosure document/business plan.

Ward's company had developed a new type of automatic transmission that will reduce the power required to propel the car and will allow a longer driving range between charges. His company also had developed a very efficient vacuum system to energize equipment such as power steering, power brakes, door locks, and windshield wipers that would ordinarily require electricity from the batteries used to power the electric motor. In addition, his company had added an extra lead-acid battery to supply power to such accessories as the radio, heater, air conditioner, headlights, and taillights. Thus the power drain of the accessories is isolated from the power used for the electric motor.

Most interestingly, Ward's company had the right of first access, via Las Vegas-based Ashurst Technology Corporation, to a new type of battery invented by the I.N. Frantsevich Institute of Problems of Materials Science, Kiev, Ukraine. Most types of batteries rely on electrochemical reactions. The Ukrainian crystal lattice battery stores the charges in crystalline layers of a sheet-like material similar in appearance to mica. Due to nonlinear quantum mechanic effects, the electrical characteristic of each crystalline layer is that of a capacitor as thin as less than one molecule.

Since capacitance is inversely proportional to thickness of the separation between the layers, the practical consequence of the crystal lattice battery is to electrically function in a manner similar to that of a giant capacitor.

The positive contrasts of the crystal lattice battery with the lead-acid battery are so striking as to justifiably portend a potential revolutionary advance for the electric car industry.

Ward's company initially planned to use twelve 86-pound lead-acid batteries weighing a total of approximately 1000 pounds. These lead-acid batteries were to be replaced with ten 20-pound crystal lattice batteries which would weigh a total of only about 200 pounds and thereby noticeably enhance driving performance.

Lead-acid batteries provide up to approximately 120 miles on a four to five-hour recharge. The crystal lattice batteries could provide up to 400 miles on a one-hour recharge. The crystal lattice batteries can supply constant voltage for up to 94% discharge. Since there is no heat nor waste product buildup as with electrochemical batteries, the crystal lattice batteries can easily last many hundreds of extremely rapid charge/discharge cycles.

The crystal lattice batteries operate well in the temperature range of -40 to +60 degrees centigrade. A side benefit of the crystal lattice batteries is that they are made only of materials which are environmentally friendly, plentiful, and inexpensive.

While the IPMS did provide test samples about the size of a large flashlight battery, they were not able to deliver on their promised 20-pound crystal lattice batteries. The U.S. Government's Defense Intelligence Agency had sabotaged the Ashurst Technology/IPMS joint venture. So the American Electric Car Company, Inc., lamentably failed to bring to market Ward's potentially revolutionary electric car.

Rodger Ward and Gary Vesperman became good friends. (BTW, he drove in city traffic, cutting in and out, etc., like the famous race car driver that he is, not like a normal driver!) Ward explained why the major automobile manufacturers as well as the oil companies suppress electric cars. Only 60% of their total profit is made when a car is sold. The dealers and manufacturers make the other 40% of their profit selling and replacing high-priced parts such as mufflers, fuel pumps, etc. Electric cars are too simple, durable and easily maintained. See his biography at http://www.motortrend.com/features/auto_news/112_news040707_ward/.

The significant profit advantage of gasoline cars over electric cars may be why as portrayed by the movie "Who Killed the Electric Car?", General Motors Corporation didn't fully support and eventually scrapped its EV-1 Electric Car. To be fair, GM claims that it refused to sell its EV-1 Electric Car because it would be unable to ensure the safety and life of the vehicle after parts makers stopped supplying components. GM also claims that the EV-1 had difficulty running uphill and didn't offer air conditioning. GM does claim that its upcoming Volt electric/gasoline car will be more advantageous than the EV-1. Because the Volt will still have a gasoline engine, the Volt should be complicated enough for GM to retain profit margins when maintenance labor and replacement parts are sold.

The complicated gasoline-powered car is fundamentally unreliable and unnecessarily expensive to fuel and maintain. It has required heroic engineering efforts to partly overcome its inherent impracticality.

Within about a year after writing the disclosure document for Ward's company's SCOR, this writer also wrote Nevada SCOR's for Natural Environmental Solutions, Inc., (NESI) and Aimrite Systems International, Inc. NESI had acquired the rights to Frank Richardson's magnet-based electrical generator that required no input power and also a bladeless Tesla-type steam turbine (see above). Aimrite Systems had patented computer-controlled hydraulic shock absorbers and a computer-controlled air ride suspension system. I have ridden a test bus equipped with an Aimrite suspension. Nice ride.

I introduced Rodger Ward to prolific Las Vegas inventor Alvin Snaper. Snaper has 600 patents, processes, and innovations such as the type font ball in the IBM Selectric typewriter and Tang the orange juice drink. Ward became enthusiastic with Snaper's demonstration of a prototype of Snaper's invention of a compressed air-driven air conditioner/heater. It relies on the principle of a vortex tube. Air whirled in a vortex tube separates with the cold air molecules collecting in one portion of the tube, and the warm air molecules collecting in another portion of the tube. The cold air is expelled from one end of the tube, and the warm air is expelled from the other end. It can be switched between providing 90% cold air and 10% warm air, or 10% cold air and 90% warm air. The metal tube is about a foot long and a half-inch in diameter with a two-inch long compressed air intake tube perpendicularly attached about three inches from one end. The intake compressed air requirement specifications are 7 CFM at 40 PSI. The volume of air expelled is twice that of a refrigerant-type automobile air conditioner while requiring only one-fourth the horsepower. Also, no warm-up period is required as with conventional air conditioners or heaters. Its efficiency is nearly 30%.

Alvin Snaper also had invented a low-temperature nondestructive process for increasing the durability of vehicle parts and tools with diamond or titanium nitride. A few years later, Snaper invented a high-performance nickel-iron battery very suitable for electric vehicles.

The Ukraine's IPMS had also invented a basalt/carbon fiber foam which is extremely strong yet lighter than fiberglass. A test vehicle made with basalt/carbon fiber foam parts was reportedly the only vehicle ever tested that can cut through a cast-iron London taxicab in a collision. (See below: "IPMS: High-Temperature Gas Plasma Detonator".)

Just for fun, I then combined these technologies into an "advanced self-powered electric vehicle concept". A current version with more details and additional technologies is available in the category "Speculative Advanced Electric Vehicle Concept" (http://www.iiic.de/docs/GVShortSummaries1-46a.htm). In addition, at a public meeting (14 September 2005) held in Green Valley Ranch Casino, Henderson, Nevada, regarding the proposed Regional Fixed Guideway traversing Las Vegas, Nevada, I submitted suggestions for possible power sources for the train, most of which also seem suitable for self-powered sources for vehicles (see http://www.rtcsouthernnevada.com/rfg/documents/September2005PublicMeetingMinutes.pdf), pp. 19-77).

The Pulsed Abnormal Glow Discharge (PAGD) reactor uses high-density charge clusters to produce useful positive AC-to-DC electrical power conversion gains such as 483%. It's an over-sized glass vacuum tube which is constructed and electrically driven within a narrow range of DC voltage so that it operates with negative resistance.

Dr. Paulo and Alexandra Correa, "New Energy Electric Power – Now! Pulsed Abnormal Glow Discharge Technology," Infinite Energy: Cold Fusion and New Energy Technology Volume 2, No. 7, March/April 1996, p. 18. Gary Vesperman's compilation of "Advanced Technologies for Foreign Resort Project" in http://www.icestuff.com/~energy21/advantech.htm includes a chapter on the PAGD reactor.

US Patent 5,416,391 for Electromechanical Transduction of Plasma Pulses. US Patent 5,449,989 for Energy Conversion System. US Patent 5,502,354 for Direct Current Energized Pulse Generator Utilizing Autogenous Cyclical Pulsed Abnormal Glow Discharges. Paulo N. and Alexandra N. Correa, Ontario.

The Correas have demonstrated 1-kilowatt outputs and have run motors under load with these PAGD reactors. GM was interested in the PAGD reactor, as the company's electrical engineers loved it. Upper management killed it, and told the Correas, "The electric car is window dressing."

IPMS: Energy Storage/Battery Devices

During the summer of 1984, airborne intelligence surveillance teams of the United States Air Force, operating out of specially configured and equipped Boeing 707 airframes (called AWAC's) electronically detected (and then shortly thereafter photographed) bursts of coherent light of enormous power originating in the vicinity of Dushambe, Turkministan. The bursts of light, a brilliant blue-green color, lasted just a few seconds and were shifted almost to the ultraviolet end of the light spectrum. The "laser" beams were directed upwards out of the atmosphere towards American military communications satellites.

At precisely the same time the AWAC's detected and photographed the laser bursts (they were referred to in that jargon by American military analysts but later proved to be something almost entirely different), several of the satellites essential to America's global military command and control communications systems became inexplicably inoperable.

The Defense Intelligence Agency, under the direction of the National Security Council and assisted by the National Security Agency, escalated its surveillance of the remote site in the Ural Mountains from which the bursts first originated. For several months, during a concerted campaign of uninterrupted observation by AWAC's and American spy satellites, no additional bursts were observed or reported. Then, without warning, in the middle of the night nearly seven months later, AWAC's crews operating just outside the territorial airspace of Afghanistan detected similar laser bursts of lower intensity during a period of intensive localized ground warfare.

The Afghanistan bursts were apparently aimed at targets under attack by Soviet infantry units. The laser bursts continued in a sustained, localized but obviously mobile attack pattern, as frequently as four or five times per hour, until nearly sunset of the next day. Photographic evidence gathered at the time by the AWAC's crew, and later corroborated by photographs taken at the actual site of the fire fight and forwarded to the U.S. for analysis, showed that the targets of the laser bursts were ammunition and fuel supply depots located in the remote desert. Several of the ammunition and fuel caches had apparently been destroyed during the attack, as demonstrated by the evidence of explosions, fire, smoke and residual infra-red heat patterns detected, photographed and electronically recorded on-board the AWAC's.

All this information was transmitted (via encrypted communications bursts, routed through the military Global Command Control satellite system) to the National Security Agency (NSA), located at Fort Meade, Maryland. Analysts there recognized that they were looking at evidence of a weapons system which had never been observed before. They did not know what had produced the laser bursts. But they did know that the technology which made such a thing possible was not available to the countries participating in the NATO Convention. They were terrified at the implications of such a development.

Within hours, the information was packaged into classified documents and conveyed to the Joint Chiefs of Staff. The Joint Chiefs examined the information while they were being briefed by the AWAC's crews which had witnessed and recorded the events. After the briefing, the crews were dismantled, and their various members stationed far away from one another, with orders never to discuss the events they had witnessed. Officially, the laser bursts never had occurred.

Secretary of Defense Frank Carlucci took delivery of the packet at his residence in Falls Church, Virginia, three days later, at a private, secret meeting held in the middle of the night. No one has yet adequately explained why the Joint Chiefs waited three full days to brief the Secretary. Early the next morning, he was driven in a specially prepared bulletproof limousine to the White House. He personally delivered the information to the new President of the United States, Ronald Reagan. The content of the Secretary's report had an immediate, measurable impact.

It was this series of events which principally precipitated the Strategic Defense Initiative, a program of military defense and reprisal based on America's state-of-the-art satellite-borne laser-optical and particle accelerator technologies. The S.D.I. system was intended to provide the U.S. with a meaningful deterrent to further aggressive use of the technology developed by the Soviet Military.

There was only one problem with this system, aside from the fact that its astronomical costs almost bankrupted the American economy: it did not work. S.D.I. was designed to respond to a kind of technology which was not achievable in the West, and which could not be explained by any of the models, materials, technologies or sciences known in the West.

In 1985, the top-secret military version of the space shuttle, code named Atlantis, embarked on a special orbital mission. One of its mission assignments was to retrieve, examine or photograph the military spy satellites which had been disabled by the laser bursts recorded in 1979-84. The results of this investigation have not been declassified or released in any but the most censored version to the public. What we do know for certain, as a matter of publicly available non-classified information, however, is that each of the disabled satellites appeared to have had at least one, and in some cases as many as four or five precisely measured holes, approximately the size of an American silver dollar, melted completely through them from the outside.

The photographs taken of the satellites show evidence of intense heat, charring and carbonized residue evenly distributed around the perimeter of each hole. The evidence is clear and unmistakable – the satellites were disabled by a coherent beam of some sort, characterized by such intense energy that it was possible to melt consistently measured holes through the exterior and interior components of American military satellites, after having passed through the atmosphere of the planet and into space for as many as 325 miles. Such a thing has scarcely been dreamed of by the American military, much less put into any but the most nominally effective operational form.

After more than ten years of political, economic and technological wrangling, and after the expenditure of more than one hundred twenty billion dollars in largely ineffectual research and development efforts, it is inescapably clear that no amount of money or political pressure, no amount of geo-political posturing or economic sanctions was going to compel the disclosure or replication of the technologies which produced the results photographed over the Carpathian Mountains and the Afghanistan deserts. The Soviets had developed a weapons system which was so revolutionary that it could not be explained, replicated or defended against.

The Reagan Administration's lack of specificity about the nature of the implied threat to which S.D.I. was supposed to respond subjected the Administration, the Defense Department and the R&D proponents of the most prominent American aerospace corporations to an endless barrage of charges by the Press and the Congress. They were characterized as being disingenuous and accused of being unreasonably secretive during successive appropriations battles in the Congress.

The truth of matter is that the Administration and the Pentagon were not being disingenuous at all. They simply could not admit to the American public that they were attempting to develop an effective response to a weapons system which they did not understand and could not replicate.

There are a number of issues intrinsic to this set of circumstances, along with several dozen others which, though less well known or economically dramatic, are no less important from a technological standpoint. It is certain that the implication of these technologies has not been lost on those multi-national corporations whose entire capital structure may be threatened by the new sciences, technologies and materials which have been developed in secret laboratories, hidden in caverns excavated beneath the Carpathian Mountains, in the former Soviet Union.

Over the past decade the West has enjoyed occasional gratuitous glimpses into the heart of Soviet science. Attempts to disclose or discuss these developments in the press have been ruthlessly suppressed by powerful special interests vested in both the public and private sectors.

The science which underlies the series of events recounted here remains at the outer limits of the most advanced technology of which the West is capable. The questions posed by the military and corporate analysts about this laser beam weapons system are far-reaching in their scope and implications. Some of them are illustrative:

1) New Model of Quantum Mechanics: The sciences and models of quantum mechanics which produced such stunning recent developments in the West as the laser and maser make quite clear how much energy is required to create a beam of coherent light powerful enough to penetrate the atmosphere, retain its coherence in spite of atmospheric diffraction (and other effects described in quantum mechanics as "thermal blooming"), and melt a two-inch hole clear through a satellite made of the most sophisticated alloys ever produced in the West. Except for limited short-distance demonstrations conducted with industrial grade lasers used in cutting operations, there is no known combination of materials or technologies extant in the West to make such a thing possible.

2) New Materials: The materials necessary to create an electrical charge large enough to power a device capable of producing such a beam certainly do exist. In quantum mechanics the term large enough does not make sense, but we can agree for the purposes of this discussion on the effect of it as represented by such commonly accepted constructs as frequency, voltage, current and ionic flow rates [as distinguished by the phenomenon of resistance].

Hydroelectric plants and large, fixed-base nuclear power plants are capable of producing enough energy to theoretically power such a device. But the energy bursts in both the Carpathians and the Afghan desert were generated by sources which moved from one location to another. In order to do that, several additional considerations must be addressed:

a. Portability: The power source would have to be transportable or be capable of storing sufficient energy to repeatedly power such a device. Western technology cannot produce either a portable power production unit or energy storage system capable of the performance requirements everyone agrees must be met to make the weapons system work, either in the laboratory or in the field. System portability was the most puzzling feature of the NSA/DIA report.

When carefully analyzed, the computer-enhanced enlargements of the photographs taken by the spy satellites and AWAC's crews failed to provide evidence of any tracks which could be attributed to wheeled or tracked vehicles operating in the precise locations and at the same time as the laser bursts which were observed. The implications of this set of circumstances was almost too much to believe – the devices were apparently either hand held or transportable and rechargeable in such a way as to allow them to be transported by one or more foot soldiers, without vehicular support.

b. Enormous Power Requirement: The materials and technologies used to construct a device capable of generating a beam of such enormous power and magnitude would have to be sufficiently advanced to enable the components to be transported without damage over significant distances in unpaved areas of very rough terrain. Such strategies, engineering techniques, construction technologies or materials do not exist in the Western inventory.

c. The continuous repetition of the laser bursts suggests that the devices can be operated repeatedly at short intervals of 12-15 minutes. This means they can be triggered with significantly higher frequency and intensity than anything which can be produced in the West, even for laboratory use. Industrial strength lasers used to cut metals require careful setup, accommodate only limited use in short bursts, require extensive cooling and must be continually recalibrated. These limitations obviously did not apply to the devices being operated in the Afghan desert. Analysts at AMTL agreed that the units would either have to be recharged via an external, independent device or somehow be capable of self-recharging in the field.

Such a thing is almost unthinkable by current Western military standards. Not only can we still not replicate the technology in any meaningful form, but the Soviets had refined the technology to a point which allowed it to be carried on the shoulders of ordinary foot soldiers and recharged in the field without motorized support.

Unbelievable! How was such a thing possible? According to some of the highly qualified scientists who scrutinized the photographs, it is not possible. The "Not Invented Here" syndrome is alive and well in the American engineering community. Some of them still insist that the pictures were either fabricated or demonstrate something completely different than this narrative suggests.

3) Energy Recharge-Batteries: How did such high-intensity laser beam generators get recharged in the middle of the Afghan desert, in the absence of powered support vehicles or fixed-based power plants? There are a number of possible alternatives. They could have been powered by some sort of advanced battery technology. It's possible, but if the battery technology used in the West is used as a model to support such a thesis, it would take a bank of the most sophisticated batteries ever designed by NASA, arrayed in series and parallel configurations larger than five full-sized Soviet T-60 tiger tanks to power such a device.

This theoretical battery bank, operating at 100% efficiency (which is not practically or theoretically possible; the best batteries manufactured in the West operate at less than 60% discharge efficiency), could conceivably produce enough direct current voltage (in a zero resistance super conductive circuit, which is not possible, either) to perhaps produce one burst of light equal in intensity to 20% of the power required to burn a 2-inch hole through a satellite moving at 20,000 miles per hour at a distance of 325 miles. Soviet ground forces were generating bursts of this magnitude every 12-15 minutes for more than 10 hours with nothing but ground troops. During eight hours of this exchange, it was totally dark. Something pretty remarkable must have been going on to make such a thing possible.

4) Energy Recharge – Solar Cells: Another alternative would have been to have whatever energy storage devices were being used to power the "laser cannons" recharged by sunlight. The state-of-the-art in photo-voltaic cells produced in the West simply would not support such an undertaking. The very best solar cells ever produced in the West have been produced by the Japanese.

These cells operate at a maximum of 19% efficiency - that is, they convert as much as 19% of the ambient visible sunlight shining on a clear, cloudless day into ion flow, which then becomes low voltage direct electrical current flowing through a circuit. The Japanese panels require months per section to manufacture and literally cost more than their weight in gold to manufacture. They are very heavy and are so sensitive to vibration and calibration that once installed, they cannot be moved at all.

Photo-voltaic cells capable of providing enough electricity to recharge a theoretically infinite energy well would have to operate at efficiencies of 50-80% to recharge batteries of infinite electrical capacity with enough power to trigger such a device. Such cells would have to be very light weight and able to withstand extremes of heat, cold, vibration, dust, wind and other conditions encountered in a hostile battlefield environment. Nothing like that exists in the Western technological arsenal.

5) Dielectric Materials – Transformers and Capacitors: Another consideration must be reconciled before this issue can be theoretically put to rest. In order to produce a burst of coherent light of sufficient intensity to have the effect which was observed and recorded by the surveillance teams, the voltage and amperage required to support such a device would have to be staggeringly high. In order to operate at all, the voltage supplied to the system must be released all at once, not in a continuous stream but in a single coherent burst so intense that any materials known in the West would either evaporate or melt. Not only would the best dielectric materials known to Western Science melt because of the heat produced by such enormous energy bursts, but before a bolt of energy of this magnitude could even be released to such a device, it would have to be accumulated and stored somehow.

A similar set of requirements of a less dramatic type is present in all the electronic devices manufactured and marketed in the West. This includes the entire range of electronic devices such as VCR's, computers, televisions and sound components, telecommunications, information storage, transmission and retrieval systems of every kind. We could not live as we do without them. The components which convert, store and release ion flow into the circuitry of these devices are known as transistors, transformers and capacitors.

This discussion delves into a slightly technical area here, so non-scientific types will need to either become familiar with the fundamentals of electricity to understand what is meant or simply give it a possibility that what is developed in the next section is a true representation of the way such things actually operate. The discussion deals with such commonly used and seldom understood concepts as voltage, current, frequencies and resistance.

(a) Transformers convert voltage at one level of current (amperage) to either higher or lower voltage levels. When the voltage is increased, the amperage or current is proportionately decreased. A low voltage produced at a high current level can be transformed into a much higher voltage at a proportionately lower level of current or "power."

(b) Capacitors: The decrease in amperage which accompanies a transformation of low voltage to higher voltage is often compensated for by a device known as a capacitor. In the most simplistic terms, capacitors "store" electrical energy until the amount of voltage and current reach a certain minimal threshold. When that point is reached, the entire store of energy is released all at once in a single burst.

The tantalum materials used in the West to manufacture such devices conform to certain standard rules which are commonly accepted by electrical engineers. These rules have only recently been stretched by new technologies and materials developed in the West. For the purposes of this discussion, though, it is safe to say that electrical engineers have long relied on these rules because they have always produced the same results when applied in the same way. Here's an example.

It is standard engineering fare which dictates that a transformer capable of accommodating one volt at one ampere of current across a grid of one ohm of resistance will be one cubic meter in dimension. If followed to its logical conclusion, this standard rule of electrical engineering would require that a transformer capable of supporting a laser burst device of the kind operated by the Soviet ground forces in the Afghan desert would have to be approximately the size of a building built on a base 100 feet to a side, nearly 150 feet high.

Surely such a device could not have been hidden from the AWAC's eye in the sky which can clearly photograph the letters on a license plate from 60,000 feet altitude, nor could it have been moved on the shoulders of ground troops without wheeled vehicular support. The fact that there was absolutely no trace of such a huge, massive transformer device (or any other kind of structure or vehicle which could be construed to serve that purpose) means that something else must have been used instead. Military analysts had absolutely no idea what it could have been.

Such a burst system cannot operate without a capacitor of some sort. A capacitive device capable of storing the amount of energy required to power a single burst from a laser cannon, made of the most advanced dielectric material known in the West, would have to have been equally massive and, further, would have to have been cooled by some sort of strategy which would have been instantly and unmistakably detected by the infrared cameras and spectroscopic scanners used aboard the AWAC's and the spy satellites which investigated the scene.

The practical requirements of such a system are best demonstrated by the massive equipment required to operate and cool the Super Conductor Super Collider linear particle accelerators recently designed by the United States and Japan. No evidence of any such capacitive device was recorded in either the Carpathian Mountains or the Afghanistan desert. How can we explain it?

Without going into any detail about how the technologies were developed, suffice it for now to say that the Soviet ground forces in Afghanistan were equipped with a prototype of a hand-held plasma beam accelerator, the likes of which had only been roughly imagined by American military analysts. The device relied on some innovative strategies. Among these were:

Energy Storage Devices: The power source for the Soviet light cannons was comprised of a back-pack array of specially designed energy storage devices. The closest thing we have in our vocabulary to compare to them is described by the term "battery." In the limited sense that these devices store electrical energy, they are batteries. Any other similarity to the batteries we are accustomed to in the West ends there. The literal translation of the Russian name for them is energy accumulators.

The batteries relied on in the West are based on the chemical properties of components which, when combined in certain configurations and proportions, interact chemically with one another. The result of this chemical interaction is that it creates both heat and a stream of liberated ions – electricity. In dry cell batteries, the process of chemical interaction is one way – once they have been expended, they are simply disposed of. It is estimated that more than 12 billion expended dry cell and lead-acid batteries are dumped into America's land fills every year.

Other batteries are designed and constructed so that the chemical reactions which liberate electrical current are reversible in some degree. These rechargeable cells are characterized by the lead-acid batteries which are used in automobiles and in commercial and industrial applications. Various strategies have been developed to make batteries relying on chemical reactions maximally effective, but the theoretical limits of effectiveness of such devices have surely been reached.

A consortium of aerospace companies working with NASA recently announced the development of an advanced sodium-hydride-based rechargeable cell which is the most efficient battery yet invented in the West. Unfortunately, it operates at an ambient temperature of 2000 degrees centigrade and, if allowed to reach temperatures outside a very narrow safe operating zone, will explode with the force of a small thermo-nuclear device of approximately ten-kiloton yield. It is not safe, but it is the best Western science has come up with.

The energy storage device developed by the I.N. Frantsevich Institute for Problems of Materials Science (IPMS), Kiev, Ukraine, works on a completely different principle. Its construction is the result of a completely unique nonlinear quantum mechanical model which makes it possible to create crystalline lattices of absolutely pure carbon (and other materials) in sheets of infinitely variable dimension which are exactly one molecule thick. The crystal formation techniques and the whole body of new science which allows for their creation in the first place are completely unknown to Western science.

The mono-molecular sheets deposited by this technique are wrapped back and forth on top of each other, more than one million times per millimeter, and are separated from each other by a distance of less than one atomic diameter. At this level of construction, the material becomes subject to the rules of quantum mechanics which are almost entirely probabilistic. That means a whole atom of carbon (or almost anything else except an electron or photon) will not fit in the space which separates the lattice sheets.

When viewed under an electron microscope, the sheets produce a pattern which looks for all the world like an endless field of four-sided pyramids, connected base to base, on a single plane, with the tips of the pyramids protruding endlessly, uniformly upwards. When wrapped back and forth on top of each other, these sheets of pure carbon crystal, made of carbon molecules shaped like trillions of identical tiny pyramids, all arrayed endlessly in identical formation, are positioned so that the tips of the pyramids on the bottom sheet are matched with the tips of the pyramids on the top sheets. What remains between the pyramid tips are open "spaces" or energy wells.

The quantum physics which describes the characteristics of the energy wells created between the layers of crystalline lattice is largely unknown to Western physicists. The Soviet model predicts with a high degree of probability that the quanta of energy referred to in the West as electrons (and, in some cases, photons), the stuff of which electricity is made, will, when introduced to the lattice structure, search, find and fit into the energy wells with military precision.

During the recharging or loading phase, the energy storage devices made of the crystalline lattice material channel one electron at a time into each well created by four carbon pyramids on the bottom layer and four carbon pyramids on the top layer. Because the rules of quantum mechanics which operate in this tiny environment demand it, each electron or quanta of energy has a certain polarity, spin and "color" (and other mathematically defined characteristics) which must be accommodated if it is to find, fit and stay in an energy well. Interestingly enough, when a current is applied across the lattice-work structure, the electrons behave precisely as nonlinear quantum mechanics predicts they will. They flow much like a fluid into the lattice field, then separate into individual energy quanta and spin into the last energy well in each layer, automatically adjusting their individual spin, polarity and color to match their characteristics to fit the requirements of each well, until the lattice is full.

Because no chemical reactions are involved in the process of marching electrons into or out of the energy well fields, there is no resistance in the circuit. In the absence of resistance, the electrons fill the wells at light speed, never missing a space, automatically adjusting polarity, spin and other characteristics, and creating no heat. The amount of time required to "charge" such a cell is less than 5% of the time required to recharge a conventional chemical battery of similar voltage and current.

The validity of $E = MC^2$ is called into question by the way these devices function. When the battery is fully charged, it actually demonstrates more mass than when the energy storage device is empty or discharged. The laws of quantum mechanics relied on in the West state categorically that this is not possible. It is the answer to the question, "How much does a beam of light weigh?"

According to the Soviet model, this is precisely as it should be. When this phenomenon was first demonstrated to scientists in the West who were testing the energy storage devices at INEEL in Idaho, they were thunderstruck. The quanta of energy, or electrons as we refer to them, which are poured into the crystalline lattice demonstrate characteristics of mass even though they are bundles of pure energy sitting in stasis, literally at rest. The characteristic of mass is verifiable – you can measure it by weighing the energy storage devices before and after they are charged. When they are charged, they demonstrate appreciably more mass than when they are fully discharged.

If this is confusing to you, to suggest that pure energy can be shown to demonstrate verifiable mass while at rest (in stasis), perhaps you can begin to appreciate how fundamentally different the physics of all this is when viewed in the terms of Einstein's classic equation $E = MC^2$.

The existence of this technology clearly is proof positive that not only does energy demonstrate the characteristics of mass, but it does so in a state of non-motion or stasis, sitting idly in an energy well. A state of stasis is a very far cry from the terminal theoretical velocity required by the constant in Einstein's equation, equivalent to the square of the speed of light.

The scientific implications of this phenomenon are truly staggering. At very least, the verification of mass as a property of energy quanta at rest suggests that Einstein's theory of relativity may be altogether incorrect as a means of describing the dynamics underlying the real nature of the material world and its relationship to energy.

The existence of this technology suggests, at very least, that energy and mass are equivalent characteristics of all things which are manifest in the material world. It is this fundamental contextual difference which distinguishes the Soviet model of quantum mechanics from the Western model. “The proof of the pudding,” they say, “is in the eating.”

Theoretical physicists may argue endlessly about the validity of the assumptions relied on by the IPMS scientists to develop their unique sciences, technologies and materials. But they cannot argue about the existence of the materials which have arisen from that context. They are as real as they can be. And they are unlike anything ever seen or contemplated in the West.

In the same way energy quanta stored in the energy wells of crystalline lattice materials demonstrate complete mathematical satisfaction with staying there indefinitely, when allowed to flow out in the form of an outgoing wave of electrical discharge, these quanta (electrons or photons, as you prefer) march right back out without resistance at light speed through a closed circuit to another use.

When these energy storage devices are discharged, they demonstrate other attributes which are not known in Western science, and which, because of the very nature of the chemical reactions we are accustomed to, are not theoretically possible according to conventional wisdom. Conventional chemical batteries, when fully charged, produce electric current at a useable voltage for perhaps 30-40% of the total discharge cycle. After that, either the voltage or amperage (or both) drop to low enough levels that the devices being powered by them cannot recognize or use the electrical current which remains available. At that point, the batteries either have to be recharged or replaced.

The crystal lattice batteries have been demonstrated to produce precisely the same current and voltage levels throughout 98% of their discharge cycle. They produce no heat during discharge, regardless of the rate at which they are discharged. This is absolutely contrary to our experience with batteries, transformers or capacitors. Until the crystalline lattice materials were specifically engineered to register an electronically detectable blip at 95-96% discharge, it was impossible even for the scientists who developed them to distinguish a partially discharged battery from a fully charged one.

There is another characteristic which is intrinsic to energy storage devices which comes into play here. It is a characteristic of materials which is described as energy density. For non-scientific readers, this concept can simply be construed to mean the amount of measurable electrical current which can be produced by any device or material when its mass is converted into electrical energy. The concept is expressed in mathematical formulas as the number of watts and hours of consumable energy which can be converted from each kilogram of material. It is expressed as watt-hours per kilogram.

Here is an example we can all understand. Consider gasoline. When converted into electrical power at 100% efficiency, gasoline has been theoretically shown to have an energy density of between 550 and 600 watt-hours per kilogram of mass. In easy terms, that means that if one kilogram of gasoline were converted into pure electricity at 100% efficiency (with no loss due to heat, resistance, waste, etc.), the reservoir of energy would power a 100-watt light bulb for 5.5 to 6 hours.

Most of the high-end conventional automobile batteries of the lead-acid variety operate at an energy density rate of between 20-25 watt-hours per kilogram. The best NASA sodium-hydride batteries operate at 48-50 watt hours per kilogram. The energy accumulator devices which have been tested at the Idaho National Electronic Laboratories have demonstrated energy densities of between 850 and 1050 watt-hours per kilogram.

What does this mean in practical terms? It means, for one thing, that for the first time in the history of science an energy storage device has been created with an energy density which is greater than gasoline or any other refined fossil fuel. It means that devices which rely on these energy storage technologies can theoretically be designed to store and deliver clean electrical power at higher rates of efficiency than any fossil fuel ever discovered.

The global implications of this technology are irresistible. It means, among other things, that the technology exists, right now, to eliminate the need to build another nuclear power plant or dam another river to produce hydroelectric power. It means we can no longer justify burning another ounce of petroleum, another piece of coal, another cubic centimeter of natural (or unnatural gas) or another tree to produce heat, electricity or power for any purpose, including transportation.

When coupled with the plasma beam devices being tested by the Soviet infantry units in Afghanistan, these energy storage devices operated at such unbelievably high rates of discharge efficiency that they made it possible to repeatedly induce huge electrical discharges in a highly mobile configuration.

The same technologies which were used to produce the energy storage devices have been adapted to create transformers and capacitors with previously unimaginable performance characteristics. Instead of adhering to the conventional western model of "One Volt at One Amp across a resistance of One Ohm equals One Cubic Meter," the Soviets have produced a capacitor which measures more than 1200 farads at 10,000 amperes in a package the size of a tuna sandwich.

When tested by the Technology Materials Testing Laboratory of the Defense Department at the Pentagon and at the I.N.E.E.L. in Idaho, totally new testing equipment had to be designed, engineered and constructed just to test the devices. The scientists at those laboratories had never tested anything like these materials before.

Instead of having to house transformer and capacitor devices in a series of trailers towed by diesel tractors or huge fixed-base facilities, the operating apparatus which supplied transformed power and high intensity capacitive bursts to the light cannons weighed less than ten pounds and could easily be transported in a backpack by a foot soldier.

One final question remains unanswered. "How did the energy storage devices, once dissipated or discharged, become recharged in the field, especially in the dark of night?"

The back-pack plasma beam device detected by the AWAC's during limited combat use in the Afghanistan desert was powered by energy storage devices constructed of crystalline lattice materials. After each laser burst, the energy storage devices were recharged every 12-15 minutes (nearly 45 minutes in the dark of night – the residual ambient heat of the desert is a very efficient source of infrared energy) by sunlight, collected and converted to electricity by four-foot square panels of "solar cell" material arrayed on a pole like a flag, each weighing less than ten ounces.

The electrical energy stored in the back-pack energy accumulators was transformed into enormously high voltages and released at almost unbelievably high current levels when the super-capacitors were sufficiently charged. The beam of "light" detected by the AWAC's crews was a field of plasma, flowing at the speed of light and demonstrating characteristics of mass (and, therefore, kinetic energy). The phenomenon represented by these bolts of lightning are not comprehensible according to the model of quantum mechanics and plasma physics currently being used in the West.

Battery packs utilizing these energy accumulator materials have been designed, produced and tested which provide more than 14 hours of continuously transmitted power on a single charge to conventional hand-held cellular telephone devices. Similar improvements in conventional battery/energy storage capacity have been developed and are being tested for such devices as video camcorders, laptop and portable computers and other similar consumer, commercial, industrial and military applications.

IPMS research in the field of layered crystals has thus led to the creation of capacitors with a very high level of capacitance (measured in farads). This technology is based on a revolutionary production technique which forms polarized surfaces of one molecule thickness, separated by less than one atomic diameter of space, held together by weak Van der Waals energy forces. The special properties created by these layered crystalline structures provide previously unimaginable internal surface areas. Super capacitors are constructed of layered materials numbering more than one million dipole sheets for each millimeter of crystal thickness.

These devices provide a virtually limitless number of charge-discharge cycles at astonishingly rapid charge and discharge rates. The potential impact of such devices on all electronic equipment currently being produced is incalculable, since virtually all electronic devices rely extensively on the West's state-of-the-art tantalum capacitance technologies.

At present, IPMS has on hand (among others) a super-capacitor roughly the size and dimension of a sandwich which develops more than 1,200 farads at 10,000 amperes. It also boasts production of a battery whose active mass energy density exceeds 850 watt-hours per kilogram. For the non-scientist (and all the rest of us as well) this means that a "battery" has been produced which, for the first time in history, produces more power per unit of mass than any fossil fuel ever devised.

Prototype testing of larger-scaled devices designed specifically for providing power to electric vehicles is currently underway. Prototypes are expected to be capable of sustained highway speeds of up to 70 miles per hour with a range of 525 miles on a single charge. The power plant for this application has been recently improved by the inclusion of a proprietary solid-state ceramic electric motor which weighs 7.2 kilograms and produces 100 horsepower on 12-volt direct current. For comparison, an electric vehicle employing a 100-horsepower electric motor performs the same as with a 500-horsepower gasoline engine.

If these performance attainments can be sustained in broad-based applications, electrically powered vehicles could be produced which would meet or exceed virtually all performance characteristics currently available in equipment relying on internal combustion, petroleum-based engines. Gasoline/diesel-powered transportation devices can be replaced by cleaner, more efficient and significantly less expensive alternatives.

The world market for current energy storage applications which will be superseded by these energy storage technologies is estimated to be in excess of $24 billion per year (1991), exclusive of electric vehicle considerations.

Joint ventures of the IPMS with more than a dozen private sector companies to develop useful energy inventions have been repeatedly sabotaged by the U.S. Government's Defense Intelligence Agency and others. (Source: David G. Yurth, *The Anthropos Files: Tales of Quantum Physics from Another World – 2nd Edition*, 2007)

IPMS: High-Temperature Gas Plasma Detonator

Since its establishment in 1951, the I. N. Frantsevich Institute for Problems of Materials Science (IPMS), Kiev, Ukraine, has been secretly developing, testing and producing more than 130 new materials in 30 general materials categories. IPMS scientists have developed a whole new science based on their unique model of plasma physics. With their invention of a high-temperature gas plasma detonator, strategic metals and other commonly used materials can literally be sprayed onto the surface of other, previously incompatible materials. These gas plasma detonation spray technologies make it possible to create permanent molecular bonds between materials which could never be married together before.

Chromium materials of an entirely new type have been developed to provide high-purity cathodes and targets. Moldable, flexible chromium (a type of material never before available) can now literally be sprayed to conform to widely varying shapes for linings (i.e., to reduce internal pipe corrosion), provide nuclear rod protection, and highly effective space hardening. These techniques have been perfected and used in practical field applications for more than 35 years.

The unique nature of these technologies may not be readily apparent to those not intimately familiar with the commercial and industrial uses of such materials. In more ordinary applications, however, the importance of being able to provide solid targets, stand-alone ingots of ultra-pure chromium, scandium, magnesium and other exotic materials, cannot be overstated. Today, the state-of-the-art in the West only allows chromium, for example, to be transported and used while in solution with other highly toxic liquids. Western scientists do not have the ability to produce free-standing ingots of any of these materials. The manufacturing models which rely on Western science make it clear that it is not theoretically possible for such materials to be produced in a free-standing form.

Similar materials coupled with the technologies of high-temperature gas plasma detonation have been developed for coating internal combustion engine parts to extend life cycle. They have been applied to enhance the performance characteristics of memory elements for computers and to support an extraordinary variety of totally new electronic circuitry. This technology has been successfully used to produce computer circuit boards whose operating components are intrinsic to the circuitry, thereby eliminating the utility or need for soldering or pin housings. The use of scandium, a very rare and exotic element available only in the Carpathian Mountains of Ukraine, make much of this possible in ways not anticipated by Western science.

IPMS-Kiev scientists have developed a series of diamond and cubic boron nitride powders which are smaller and more uniform than any other manufactured today. Also available in this family of materials are very fine (sometimes mono-molecular) ultra-high purity powders and liquids of refractory metals including chromium, vanadium, tungsten, scandium and molybdenum. These powders can literally be sprayed as a plasma field to form continuous, seamless, flexible molecular bonds with host surfaces without electrolytic processes. These materials demonstrate clearly superior performance in tool hardening, cutting edge equipment and polishing.

IPMS-Chernovitsky scientists have developed an entire family of previously unknown technologies based on woven fibers made entirely of 100% pure basalt fibers (lava rock). This totally new technology allows for the production of flexible, weave-able threads. These fibers are fundamentally resistant to heat, demonstrating a softening point in excess of 800 degrees centigrade. Fibers of this material have been produced in diameters of less than 3 microns (millionths of a meter), more than 10 times smaller than a human hair.

Allied Signal Corporation in the United States has attempted unsuccessfully for more than twenty-five years to produce a single fiber of a similar type material. Today, the Ukraine has the capacity to produce these raw fibers at the astronomical rate of 100 tons per month.

These materials are currently being produced in applications involving brake shoes and clutch plates with extraordinary performance characteristics. These materials sustain only about 15% of the wear currently attributed to asbestos-based materials used in identical applications, with the added advantage that they are environmentally friendly (non-toxic and non-polluting). In current applications, parts fabricated of basalt fibers actually operate at higher efficiencies as surface temperatures are increased, up to operating temperatures exceeding 800 degrees Centigrade.

Basalt fiber materials have also been shown to demonstrate superior insulating capabilities over commercially available materials in applications involving both temperature and sound. They have been used in applications related to mine roofing, trays of water cooling systems and as both gas and fluid filters. A four-inch deep pile of 5-micron filaments has been shown to demonstrate heat insulating properties in excess of R-65, which is nearly four times the efficiency of glass fiber equivalents, at one-half the weight.

Further, basalt fibers have been woven together with threads of tungsten, chromium and other strategic metals to produce cloth materials with previously unheard of characteristics. Woven metallic threads and fabrics of this type have never before been produced anywhere in the world.

This writer, Gary Vesperman, has included in his “Advanced Self-Powered Electric Vehicle Concept” (see http://iiic.de/docs/GVShortSummaries1-46a.htm) a monocoque (unibody) basalt/carbon fiber foam body/frame. The IPMS-manufactured basalt/carbon fiber foam is extremely strong yet lighter than fiberglass. A test vehicle made with basalt/carbon fiber foam parts was reportedly the only vehicle ever tested that can cut through a cast-iron London taxicab in a collision.

To utilize this technology to create an automobile enclosure, three technologies are needed:

1. The basalt fiber technology can only be found at the IPMS. There may still exist some spools of the stuff in or around Kiev. The principal value of the material is that it has a softening temperature of 805 degrees centigrade.

2. The Russians use powdered metallurgy to alloy their strategic metals – the ideal mix of metal powders would be aluminum and magnesium. Since both can be found in finely particulated powders and when mixed together in the right ratios, these two metals form a material which is utterly resistive to corrosion and which has excellent tensile strength.

3. The powdered metals are mixed in a chamber like dry cake mix and then applied using a third technology – in IPMS documents, this technology is referred to as a "High-Temperature Gas Plasma Detonator". The metal powder is poured into a ceramic container, which funnels it into a specially designed high-temperature containment vessel which is also surrounded by super magnets (see IPMS-Kiev and Arzamas-16: Super Magnets elsewhere in this energy invention suppression compilation), arranged in a very precise order to create a compressive effect. When the powdered metal is brought into the chamber, high voltage, high pressure and extreme magnetic fields reduce the metal powder to a plasma, which is then expelled through a nozzle and onto a target – in this case, the woven basalt fiber which creates the shape of the vehicle.

When the metallic plasma collides with the basalt fiber material, it has a temperature of about 1600 degrees centigrade. This causes the basalt fibers to soften and partially melt – but the cooling gradient for this material is so steep that it cools almost immediately below 800 degrees centigrade, at which point the fibers reconstitute. This creates a basalt fiber-reinforced metal-alloyed shell which is extremely strong, very light weight and can be polished to a high sheen.

This is the technology the Russians have used for 35 years to create fuel cells for their huge rocket boosters – and it is the reason their boosters are so light, have no gaskets or seams and can be reused over and over again. It is primarily because of their extensive use of these integrated technologies that the Soviet space program has been able to consistently deliver larger payloads into orbit that any other nation since the space race began in 1957.

Joint ventures of the IPMS with more than a dozen private sector companies to develop useful inventions have been repeatedly sabotaged by the U.S. Government's Defense Intelligence Agency and others. (Source: David G. Yurth, *The Anthropos Files: Tales of Quantum Physics from Another World – 2nd Edition*, 2007)

Remy Chevalier (Reporter): NiMH Batteries; Solid-State Lithium-Ion Batteries

The best Nickel Metal Hydride (NiMH) batteries are no longer on the market. Why? Because either Cobasys has no intention of ever mass producing powerful NiMH automotive packs, or they just don't know how, even though they own the patent. The cells they displayed at the last EDTA conference were bulky at best, and certainly a million years away from the level of engineering exactitude Japanese automakers expect from their suppliers.

Essentially Matsusita took some of the information from their original, but mediocre patents and developed a functional NiMH battery that gave a range of 160 miles to the General Motors EV-1 and 110 miles to the Toyota RAV4 EV. This Panasonic M95 was also getting 1-2000 deep cycles and 100,000-150,000 miles on a battery pack. Something the oil companies and Detroit automakers don't want on the market, despite the Fortune 500's good mood for natural capitalism.

So now that the best NiMH battery technology for EV's has been removed from commercial circulation, Toyota, Honda and Ford are stuck using inferior NiMH battery technology in their hybrids. Toyota has indicated it will take up to 4 years for the next generation lithium-ion (Li-ion) battery chemistry to be as reliable and affordable. Till then, it's touch and go as Toyota can't crank out enough hybrids off the assembly line to meet demand, especially in deliveries to corporate fleets, taxicabs and limousine services.

State-of-the art lithium-ion chemistry is in limbo at some California-based company who has managed to secure the exclusive production rights to the only Li-ion technology that really counts, roll-to-roll solid-state battery production. That's right; no more liquid chemistry… no leakage, no over heating, no explosion, extreme light weight, easy mass production! Just like printing mylar off a printing press! Just like laminating plastic photovoltaic sheets!

Instead more conventional liquid Li-ion chemistry is being pushed feverishly. Toyota is buying out major Li-ion startups in Asia. Other Li-ion battery companies like Valence, Electrovaya, Kokam, LG Chem have attractive polymer Li-ion batteries, but they are still all based on the older liquid chemistry model, and therefore more expensive and more complicated to produce.

The chemical genius who came up with the Li-ion solid-state polymer roll-to-roll protocol is a professor at MIT who does not own his own technology. MIT owns the technology, and it is the MIT licensing office which gets to decide what companies do or do not get awarded these licensing rights. This revolutionary technology has been in limbo since 1995!

Is it because MIT is cashing checks from the Rockefeller Bros. and the Ford Foundation? Is it pure incompetence? Is it a repeat of the cold fusion debacle Gene Mallove wrote about in his book "Fire from Ice"? It's hard to tell as everyone involved is terrified to talk about it openly, which is why I am not mentioning any names. Frequent visitors to the Electrifying Times website know exactly who I am talking about!

My suspicion is that certain forces within the military, and now Homeland Security, do not want solid-state roll-to-roll Li-ion batteries from entering the civilian marketplace, the same way you can't buy Green, a special duct tape developed for Groton Electric Boat workers to strap metal parts, so strong it instantly bonds to the skin, requiring surgery if accidentally touched.

What a poor boy to do who wants to save the planet if the powers-that-be won't give him the affordable batteries he needs to make a 0 to 60 in under 3 seconds EV with a 200-mile range on a single charge? That's the question we should all be asking ourselves instead of lamenting about who killed the electric car!

The batteries are there, being manufactured for military applications all over Connecticut! If you want plug-in hybrids and 100% pure EVs so you don't ever use a drop of gasoline again, with equal to if not better performance than any liquid fuel engines, then ask yourself why MIT, since 1994, has done very little to get their solid-state Li-ion roll-to-roll battery patents into production. Don't follow the money; follow the trail of misappropriated and shelved patents.

Congress needs to put back into question the entire review process of patent law, and its consequences on environmental health, by imposing strict fines to whoever is caught buying patents for the sole purpose of keeping its protocol out of commercial circulation. (Excerpted from "Who Killed Better Batteries?" by Remy Chevalier, *Electrifying Times*, spring-summer 2006, Vol. 10, No. 1, www.electrifyingtimes.com.)

(Erik Masen adds more details in his "Suppression of Quantum Leap Inventors" *Electrifying Times*, 2007, Vol. 10, No. 2)

Chevron-Texaco bought into a Detroit company, Stanford Ovshinsky's Energy Conversion Devices (ECD), and changed their name to Cobasys. ECD held the original patents on nickel metal hydride battery technology, but never successfully marketed a turnkey NiMH battery for major markets. They did sell a considerable amount of NiMH batteries to GM for the EV1. Panasonic came along and refined this NiMH battery technology into an indestructible battery of higher energy density and longer life. That enabled the Toyota RAV4 EV (electric vehicle) to get 80-120 miles out of a battery cycle, and get over 100,000 miles of battery life out of this improved NiMH battery. ECD-Cobasys filed a lawsuit of patent infringement against Panasonic and won. This action essentially shutdown the import and use of the Panasonic M95 NiMH battery that was so successful in making EV's practical for the GM EV1, Ford Ranger Electric PU, and the Toyota RAV4 EV. As a result the proven very popular M95 90-ampere-hour NiMH is not for sale in the United States. ECD-Cobasys also put heavy licensing fees and restrictions on the NiMH battery used in the Toyota's present hybrid fleet.

Paul M. Lewis: Airmobile

In 1936, Paul M. Lewis designed a three-wheeled car that looked a lot like the present Volkswagen bug. He called it the "Airmobile", and his original model is still on display at Harrah's auto Museum in Reno, NV.

Though Lewis had not known what Dr. Ferdinand Porsche was doing in Germany, the Lewis Airmobile was amazingly similar to the popular VW beetle.

Both vehicles were low cost, simplistic in design, used horizontal opposed four-cylinder air-cooled engines, transaxles, independent suspension systems and unitized body construction.

When World War II came along, it sent VW soaring in Germany, but killed the Airmobile. Porsche fit into the German establishment, but Lewis was a "crackpot" inventor and a pain in the neck to the economic status quo.

The VW beetle's popularity proves that Lewis' original idea was valid and worthy, despite the laughter from Detroit.

The Airmobile was driven out of business in the late 1930s by the Securities and Exchange Commission and the U.S. Postal Department, who have been called bureaucratic flunkies for the oil-auto monopoly.

"I was harassed for two years, and they refused to let me sell stock in my company on the pretense they were investigating possible wrongdoing." Lewis said. "After I was beaten down, they sent representatives to tell me they found nothing wrong, and I could sell stock. A man can't make a dead horse walk."

After losing the Airmobile, despite driving it through 26 states for more than 45,000 miles without a repair, Lewis went from Denver to Los Angeles, where he continued inventing.

Joel McClain and Norman Wooten: Magnetic Resonance Amplifier

On December 12, 1994, Joel McClain and Norman Wooten, two Dallas inventors, discovered that a magnetic resonance amplifier could be capable of over-unity gain energy conversion. The electrical output of their prototype was five times the electrical input. They made a point of publicizing their invention as widely as possible via the Internet right away so as to forestall possible suppression. Since then, they have authored articles on the magnetic resonance amplifier in Electrifying Times, Extraordinary Science, and New Energy News.

A personal friend of Newt Gingrich became very interested and arranged for the Physics Department at Georgia Institute of Technology to experiment with it. They were able to increase the gain so that the output is 18 times the input. Since they could not explain this according to conventional physics, they refused to publish their results for fear of losing the respect and esteem of their peers.

Gingrich had been following the MRA with keen interest so when his friend told him of the problem with Georgia Tech, Gingrich arranged for the federal funding of Georgia Tech programs to be cut off. The President of Georgia Tech who had been in the dark on all this began getting phone calls from enraged Georgia Tech professors. Then the Physics Department published their findings.

At the International Tesla Society Symposium in Colorado Springs (July 20-23), McClain and Wootan gave a lecture on their magnetic resonance amplifier. The oscilloscope waveforms of output vs. input they showed were very odd. They sort of loop around themselves.

A few days after the conference, Wootan's two-year-old boy had been abducted, Wootan was running for his life in Canada, and McClain was in hiding.

The magnetic resonance amplifier's claimed over-unity power conversion efficiency was later shown to be a measurement error. However, a past issue of *Electrifying Times* claims that Scott McKie has invented a solid-state over-unity electrical energy converter with an input of 15 volts, .438 amperes (7.25 watts) and an output of 34 volts, 127 amperes (4318 watts). McKie's converter apparently is a more advanced version of the magnetic resonance amplifier.

Al Wordsworth: Electrical Generator and Advanced Carburetor

The details are sketchy and second-hand, but inventor Al Wordsworth had to contend with harassment of both his advanced carburetor and electrical generator. His generator had an input of 3 amps at 12 volts and an output of 32 amps at 6 to 8 volts. He died some years ago. It is believed his generator design is lost.

John Richardson: 90+ MPG Carburetor; Atomic Isotope Generator

John Richardson invented a "carburetor improvement/adjustment mechanism" which enabled autos to achieve 90 to 100 miles per gallon of gasoline. Richardson also invented an "atomic isotope generator", about the size of a washing machine, which could electrify a 5,000 sq. ft. house or building for over 100 years at a minimal up-front cost. Vicious threats from big business to his life and his family persuaded Richardson to hide the prototypes and to stop further work. (Source: http://center-for-natural-health.com/articles/richardson.html)

Fish/Kendig: Variable Venturi Carburetor

In the late 1950's the Fish/Kendig Variable Venturi carburetors got some very interesting mileage figures. John Robert Fish had invented a carburetor that double the gas mileage of Detroit's standard carburetors. When Detroit snubbed his invention, Fish tried selling his invention through the mails to do-it-yourself mechanics. The Fish carburetor even got into production on a small scale.

He was growing successful when Post Office Department agents swooped down on him for "investigation of fraud". Several years later he was exonerated of any charges. But until then the mails to and from his business had been stopped during the lengthy "investigation". He was wiped out financially.

In the early 1970's a young college student (name unknown) entered his Mercury "gas hog" in the California Air Pollution car race and won hands down. He was using the Kendig Variable Venturi carburetor that a small company (name unknown) had manufactured in Los Angeles for racing cars.

Within a week the student was told to remove the carburetor since it wasn't approved by California's Air Resources Board (CARB). His car had reduced pollution and doubled the gas mileage (for that model). This may have been suppression conducted by the Air Resources Board. The movie "Who Killed the Electric Car?" accuses CARB as one of the "gang of killers" of GM's EV-1 electric car.

Dick Belland: 100 MPG Carburetor that Runs on Gasoline Fumes

In 1979 Dick Belland and his brothers and a nephew were experimenting with an automobile carburetor which ran on gasoline fumes. They stopped when Belland received telephone threats to be fitted with a pair of cement boots. For story see http://www.byronwine.com/files/Dodge%20truck.pdf.

Ron Brandt: 90 MPG Carburetor

Ron Brandt is the inventor of the perm-mag motor. He is now of retirement age. He has personally told this writer, Gary Vesperman, that he is scared of working on over-unity free energy machines.

When Brandt was a young man, he invented a 90-mpg carburetor. He was paid a visit by a man from Standard Oil, another man, and two men wearing U.S. Government Marshal uniforms. They told him that if he ever made another carburetor, they would kill him, his wife, and two young children. Brandt was quickly persuaded that his life wasn't worth a "damn" carburetor. He happened to think to memorize the badge numbers of the two US Marshals and so had an attorney in Washington, DC check with the US Marshal's office. They had no record of the two badge numbers.

Welton Myers: Myers' Efficient Carburetor

Welton Myers, Director of Technology for Pure Energy Systems, does not have a resume, as he has always been self-employed.

I, Sterling D. Allan, received the following information from him via phone interview today.

Though Welton attended Cornell University, with a major in Agricultural Engineering, that is not of significance to him. It didn't take many years before he came to the realization that the mainstream science he learned there is full of errors (techniques deplete soil of nutrients). He completed there in approximately 1954.

From 1954 through 1960, Welton farmed (mainly corn) and raised 50 dairy cows. Towards the end of that time he also dabbled in logging and mining.

From 1960 through 1975, he laid the foundations for what today is known as Habitat for Humanity. He set up non-profit programs in New York and California, taking groups of ten families who helped each other build homes, and learned skills in the process, which they could later use in a trade.

He helped build and renovate over 1000 homes during this time. Better Rochester Living is the name of the first program in New York, and Self Help Enterprises (SHE) was the name of his first program in California.

In 1975, he began building homes for profit when his funding dried up for the non-for-profit program he was doing. He built around 25 homes in the $100k range.

Then in 1978 he had a serious accident that put him out of commission for physical labor until 1984. He was rear-ended by a car going 120 mph. "This was one of my most creative periods" he said, ironically, because it was also during this time that he had a very difficult time remembering the simplest things.

That was when he did the carburetor project in which he transformed a car to get three times the mileage. The organization he founded along with Bill Cope, "Knowledge is Power," held weekly seminars at Robert Wesley College, where people came to learn how to convert their cars to get three times the gas mileage.

That project came to a halt when his car was sabotaged, the pressure release valve being clamped down tight, causing his car to explode while he was driving it. The next day, as the car sat on blocks in his drive way, a trailer pulled up, and some men who told Welton's wife they were hauling the car for Welton (not true), towed the car away; and Welton never saw it again.

The blueprints are held by an associate today, but Welton does not recommend the design because of the high pressures involved (3000 – 6000 PSI), which could be dangerous if the car is in an accident.

It was also during that time (1983) that he built a magnetic motor along with Bill Cope and an inventor who said he had been involved with Tesla. The day after they announced that they were ready to open the technology to a public offering, the laboratory was raided, their equipment smashed, and their inventor was threatened at gunpoint to leave the country, which he did. That inventor had also been involved with John Searl and witnessed his flying saucer technology.

Welton later located the inventor in California, but he had Alzheimer's disease by then and couldn't remember anything.

Also during this time, for employment on the side to help cover expenses, Welton worked in a laundry designing the mechanical end of an automated system.

In 1984, Welton returned to working with COOP housing, starting with ten "slow" individuals who were not able to hold down jobs, and making a construction crew of them. At the end of two years, they built 7 homes for 7 of them. The other three were not able to get funding together for a mortgage. With some of this crew, he then went on to build more expensive homes, building 10 homes at a time, for example, in a new subdivision. Many of the homes were in the $400 - $500 range. They also installed around 100 solar panel systems during this time.

Then early in the 1990's he began to get involved in the patriot scene, helping people understand some of the inherent problems with today's tax structure, and helping them protect their assets. He was involved in Cleon Skousen's seminars with the National Center for Constitutional Studies. He learned how to create corporate shells with strong layers of protection.

Also during this time he began traversing the country meeting inventors and reviewing their inventions, to help facilitate their progress toward the market.

I met Welton about two years ago, and it was actually his phone conversation with me that spurred me to begin a "free energy" listing on my greater things website, which has grown into what it is today. We have been close friends and business associates (www.perentech.com) during that whole time.

I know Welton to be one of the brightest minds around. You would never know he's past 70 to speak with him on the phone. He remembers details of conversations and technologies better than I do, at nearly half his age. I look at him as one of the "grandfathers" of the Free Energy movement. --- Sterling D. Allan.

George Wiseman: Fuel Savers

George Wiseman is the President and Chief Executive Officer of Eagle-Research in Oroville, Washington (see www.eagle-research.com). George's research organization verifies, develops and distributes practical energy-saving methods and devices. Because he sells fuel-saving plans and devices, he of course is a target of suppression efforts that he describes in an email (copied below with deletions) that is displayed in http://www.zpenergy.com/modules.php?name=News&file=article&sid=316.

Date: Fri, 18 Apr 2003
From: George Wiseman
Subject: Re: Re: Suppression

>> I realize that 90 percent of the 'physicists' in these groups are simply here to block progress, to
>> maintain the status quo of disinfo and cointel -- preserve the monopoly of western deception and
>> newspeak – to regurgitate the same NOTHING they have been programming us with for ten decades.
>
>Do you mean the same "NOTHING" that has made possible all of the following technology that
> conspiracy addicts like you take for granted?

Whoa there... The problems and perceptions here are extreme, yet both valid in context.

I don't want to spark a big discussion, for which I do not have time nor interest. But I just couldn't resist putting in my 2 cents because I see innocence and ignorance being displayed.

There have obviously been major advances in some fields, like electronics and medical science. Much worthwhile has been accomplished. But I submit that it has either been in spite of suppression or in areas where suppression doesn't exist.

For example; computers wouldn't have been implemented to the public, bringing down their cost and fueling greater research if lone inventors hadn't developed both home computers and operating systems that would have put IBM out of business. IBM was caught unprepared and did what they could to reestablish control of the new market.

Medical science is so dominated by 'vested interest' that they are trying to even label vitamins as 'drugs'. Cures for diseases are often ignored and even actively suppressed in favor of techniques that just treat symptoms and incidentally make much more money.

In other fields we are still using technology virtually unchanged (with only cosmetic changes) for over 100 years, like internal combustion. This is a field in which I have some expertise and where I have personally experienced suppression of several different kinds. I have given a few of the details in my newsletters: http://www.eagle-research.com/newsletter/newsletter.html.

The electrical power grid, radio, robotics, and the basis of much of the medical diagnostic was invented and implemented by Nikola Tesla around the beginning of last century.

I can prove beyond a reasonable doubt that 'Vested Interest' does suppress technology that would cause their 'investments' to produce less income. Depending on the particular technology, such as fossil-fuel consumption, vested interest could even be governments.

I have personally attended a meeting between industry and a trade school where the topic was what and how to train the students. I can verify that industry as 'vested interest' wants the students to ONLY fix what exists. They are taught what to think, not how to think. These meetings take place on a regular basis because schools need the 'donations' from industry and they want their students to be 'employable'.

I'm sorry to say that my experience is that this 'what to think' effect is spread throughout the education system, including professions such as 'physicist'. Some are open-minded enough to actually look at hair-brained 'alternative energy' ideas and try to educate when they see an idea that won't work. Most of those that discover an idea that will work simply disappear. I haunt old bookstores because I find them gold mines of information that has been eliminated from current teaching.

I have never had a legitimate customer complaint, yet my business has been investigated several times by various U.S. Government and 'public protection' agencies, because I sell 'fuel-saving' technology. I have had my own telephone company tell me that my telephone was tapped. I have had the post office 'lose' over $50,000 worth of customer orders. These harassments are only a few of the barrage of suppression techniques that I live with everyday.

I could go on and on, easily getting labeled as a "conspiracy addict". Since I am an inventor in these technologies and have felt the suppression in many ways, I believe I have the right, and perhaps obligation, to tell people who live in comfortable niches that the suppression they are not directly feeling, is in fact affecting their lives.

We all could be living very much higher standards of living if only technologies that already exist were not suppressed. In the course of my 'alternative energy' research, I recently developed a 'spin-off' technique, using technology invented in the 1800's, to inherently eliminate the 'phantom load' and 'inductive losses' experienced by most transformer applications. In a lot of cases, particularly in small appliances, this would cut power consumption by over 50%. This single technique would save billions of watts. I can't even imagine how much power it would have saved if it had been implemented from the beginning of using AC electricity.

Anyone who thinks that suppression doesn't exist has simply not looked at the facts. For example; spending only a day in the patent office, I found that in the last 25 years there have been over 3500 fuel saver patents – not one of which is on the market. This is not because fuel savers don't work, because I prove everyday that there are fuel savers that do work. It is because the suppression mechanism is in place and 'self-propagated' by people who have no idea that they are part of the process. They are only propagating what they were taught to believe.

I don't dwell on it, but suppression is very much a reality in my life. It is why I structure my business as I do. I am a self-employed inventor and have been since 1984. I do not patent. I distribute full facts on my developments directly to the public. I do not sell 'devices' that trigger the major suppression responses.

That's my 2 cents. I felt obligated to say it. It may not be fair, but I will not respond to discussion on this subject; it's already taken two hours of my time to compose this email.

Thanks for reading.

George Wiseman
President, CEO of Eagle-Research
http://www.eagle-research.com

Tom Ogle: 100+ MPG Oglemobile

Tom Ogle's Oglemobile ran on fumes extracted from a heated tank in the trunk without a carburetor (see US patent 4,177,779). The media witnessed a test of a 4,600-pound 1970 Ford Galaxie which was driven 200 miles on less than two gallons of gasoline. Ogle predicted that an economy four-cylinder engine would achieve 260 to 360 miles per gallon.

A Shell Oil Co. representative asked Ogle what he would do if someone offered him $25 million for the system. Ogle responded "I would not be interested". He later said, "I've always wanted to be rich, and I suspect I will be when this system gets into distribution. But I'm not going to have my system bought up and put on the shelf…"

The August 1977 issue of Argosy magazine which carried a five-page article on the Oglemobile has disappeared from many libraries and even the Library of Congress. Argosy even ceased publication shortly after the article published. The El Paso NBC TV station that had filmed the test run "lost" the footage.

Tom Ogle died in 1979. Two others connected to Ogle died mysteriously. One was mugged while jogging with no cash. The other died while working for the military at a shooting range.

Charles N. Pogue: 200+ MPG Carburetor

In Jan. 3, 1935 Charles N. Pogue was issued a Canadian patent – 353,538 – for a High Mileage Carburetor.

In Apr. 9, 1935 Charles N. Pogue was issued a US patent – 1,997,497 – for a High Mileage Carburetor.

In Jan. 7, 1936 Charles N. Pogue was issued a US Patent – 2,026,798 – for his newer High Mileage Carburetor. Pogue used the carburetor for about ten years on his car and produced about 200 carburetors thru the Economy Carburetor Co. (Copies of the following three test reports plus a drawing of the Pogue carburetor can be viewed at http://www.byronwine.com/files/1936%20Ford%20test.pdf.)

In early 1936 T.G. Green, President of Breen Motor Company, Winnipeg, Manitoba, Canada tested the Pogue carburetor on a Ford V-8 Coupe and got 26.2 miles on one pint of gasoline. The performance of the car was 100% in every way. Under 10 mph the operation was much smoother than a standard carburetor.

In April 30, 1936 Ford Motor Company, Winnipeg, Manitoba, Canada tested the Pogue carburetor and was at "a loss to understand" how the carburetor got "25.7 miles on one pint of gasoline"! (That's approximately 205 mpg). Mr. W.J. Holmes and Mr. Purdy conducted the test for Ford Motor Company.

In Aug. 10, 1936 S. Stockhammer tested the Pogue carburetor on a 1934 Ford V-8 Coupe and got 28 miles per pint of gas. "I can say the performance was all anyone could desire in every shape of form."
In Dec. 12, 1936 Canadian Automotive Magazine states that the standard carburetor gets about 25 mpg at only 9% efficiency. Therefore the Pogue carburetor is 72% efficient overall at 200 mpg.

Pogue had his shop broken into and carburetors stolen.

In 1953 CARS magazine stated that in the opening months of 1936, Pogue panicked the Toronto stock exchange and threw fright into the major oil companies. Stock exchange offices and brokers were swamped with orders to dump all oil stock immediately. This same article states that Winnipeg's largest automobile dealers tested the Pogue carburetor and got results of up to 216.8 mpg!

In 1945, according to an unnamed source, carburetors marked "POGUE CARBURETOR, DO NOT OPEN" were used on American Army tanks throughout WWII but were removed from circulation after the war ended.

In 1980 Arthur C. Sgrignoli, after 45 years, has built a legendary Pogue carburetor by hand and is said to have achieved an efficiency of 86%. Contact was made through his brother, William J. Sgrignoli.

In 1981 Ultra-Lean Carburetors of Northridge, CA, was selling a set of plans for the Pogue carburetor for $50.

As of January 1981, Charles N. Pogue was still alive at age 81 and was living in a rest home in Winnipeg, Canada. He refused to talk to anyone or to receive visitors from outside his own family.

On the other hand, according to http://www.snopes.com/autos/business/carburetor.asp, the Pogue carburetor is an "urban legend". Perhaps some university mechanical engineering students can be funded to replicate the Pogue carburetor as a laboratory exercise and then measure its performance.

An email correspondent of Gary Vesperman wrote June 11, 2006 that, before he got involved with an electronic mileage booster two years ago, he checked the Internet and both Consumers Union and the Department of Energy lambasted all previous fuel optimizers. DOE listed about 75 of them they tested and which did not really work.

(Of course they say that… I think the Pogue carburetor was the one that worked until lead was added to gasoline, and it was this additive that clogged up the device and prevented the mileage gain. Bruce McBurney, source. McBurney's site http://www.himacresearch.com/ has more on carburetors.)

The addition of lead to gasoline resulted in widespread permanent environmental pollution of millions of pounds of poisonous, brain deadening lead. In 1967 at the University of Wisconsin-Madison this writer, Gary Vesperman, took an introductory course in meteorology.

One lesson Professor Reid Bryson gave was based on a study he had conducted of the extent of lead poisoning. I used his research results as the basis of a "letter to the editor" which was published in *Business Week* magazine in 1970.

I am not sure if I have the dimensions correct, but the numbers went like this: Residents of northern Wisconsin were found to have 0.1 micrograms of lead per cubic centimeters (cc) of their blood. Residents of the northern suburbs of Chicago had 1 microgram of lead per cc of blood. Residents of downtown Chicago had 4 micrograms of lead per cc of blood. The fatal level of lead poisoning apparently is approximately 6 micrograms of lead per cc of blood.

So in the *Business Week* letter to the editor I postulated that in another decade or so, rising levels of lead in blood would result in greatly increased mortality rates among downtown Chicago people since they evidently were already two-thirds dead.

Weeks later, by coincidence (?), there was intense national publicity focused on lead poisoning which resulted in Congress passing a law mandating a phase-out of lead in gasoline. Some people claim there is a so-called "law of unintended consequences". The platinum dust hazard from catalytic converters is another awful example of this "law". Maybe it is time for me to once again try to rouse the rabble?

Professor Bryson was an expert climatologist. He explained to our class the basics of global warming due to the atmospheric increase in carbon dioxide – as also explained by Al Gore in his movie An Inconvenient Truth. Bryson also explained the basics of global cooling due to increased dust plus sunlight reflecting off the ice crystals from jet engine exhaust which float high in the atmosphere for up to six hours.

I remember cornering Bryson after one of his lectures and asking him which was going to "win" – global warming, or global cooling? With an unforgettable grim look on his face, would you believe he said global cooling?!!

39 years later with vastly more data, global warming dominates the scientific consensus. Most worrisome, in 2006 climatologists found a preponderance of positive global warming feedback loops compared with pitifully few negative global warming feedback loops. (Source: "Our worst fears are exceeded by reality" http://news.independent.co.uk/environment/article2110651.ece) Global warming seems to be speeding up!

Yet ExxonMobil tries to bias global warming research towards the possibly dishonest conclusion that global warming isn't really happening. For example "Is the Sky Really Falling? A Review of Recent Global Warming Scare Stories", is a Cato Institute research study published August 23, 2006 by Patrick J. Michaels in http://www.cato.org/pubs/pas/pa576.pdf. http://www.cato.org/current/global-warming/ has an entertaining list of sarcastic titles of papers on global warming by Michaels. Is Michaels being paid to be a disinformation hack for ExxonMobil rather than as an honest weather scientist?

The Cato Institute received $55,000 from ExxonMobil in 2002-2003. The George C. Marshall Institute received $185,000 from ExxonMobil for "Climate Change Public Information and Policy Research" in 2002-2003. The Tech Central Station Science Foundation received $95,000 from ExxonMobil for "Climate Change Support" in 2003. Michaels is also employed by the George C. Marshall Institute and the Tech Central Station Science Foundation. (Source: http://www.environmentaldefense.org/article.cfm?contentid=3804&CFID=21084385&CFTOKEN=29888831.) Incidentally, Michaels earned his Ph.D. in ecological climatology from University of Wisconsin-Madison in 1979.

The Union of Concerned Scientists lays the blame for at least some of the ongoing uncertainty squarely on the shoulders of the world's largest publicly traded company – ExxonMobil. The scientific group has documented that the oil company has "funneled nearly $16 million between 1998 and 2005 to a network of 43 advocacy organizations that seek to confuse the public on global warming science".

Many of the organizations have overlapping staffs, board members and scientific advisers, according to the report, leaving the public with the impression that agreement on the certainty of global warming is far from universal. Funding by ExxonMobil allows these affiliated organizations to "publish and republish the works of a small group of climate-change contrarians," the report states.

ExxonMobil has a lot at stake. A shift toward cleaner forms of energy could greatly diminish its revenue, which reached $339 billion in 2005. (Sources: January 6, 2007 Las Vegas Sun editorial and http://www.ucsusa.org/assets/documents/global_warming/exxon_report.pdf.)

Allen Caggiano: 100+ MPG Fuel Implosion Vaporization System

INVENTOR'S HARDSHIPS --- SUPPRESSION OR COINCIDENCE? YOU DECIDE!
IS US. PATENT # 5,782,225 BEING SUPPRESSED ....OR... ARE THE "HARDSHIPS" THAT THE INVENTOR SUFFERED JUST "A COINCIDENCE".??????." YOU DECIDE !

In the early 1970, in Brockton, Ma, I owned and operated a company called Debal Heating and Air Conditioning. This was about the time that we had that phony gasoline shortage. Each morning myself and 12 employees would sit in the gas line with 6 trucks to get a mere 5 gallons of gasoline. As I sat in that gasoline line day after day, I started to think there must be a better way. If they have the technology to put a man on the moon they must have the technology to get much better gas mileage.

It wasn't long before I built my first fuel vaporization system. I read everything that I could get my hands on about this. Well sad to say it didn't work. It made plenty of vapors, and exploded like a BOMB. Over 70% of my body received 3rd degree burns. I spent 69 days in intensive care, kissing death several times. Don't worry, all the bugs are worked out now.

October 15, 1983 was the birth of my Fuel Implosion Vaporization System. At this time I owned and operated a company in Brockton Ma, called Weatherall Energy Research and Development. I had just finished building a commercial high-efficiency air conditioning evaporation coil when I poured one gallon of gasoline into one end to flush it out. To my surprise massive fumes discharged from the other end, and all I got back was less than one cup of gasoline.

I started brainstorming, I miniaturized the air conditioning evaporator coil, installed it in 1973 Dodge station wagon with a 318 engine. By early 1986 we had worked out all the shortcomings and bugs and had a working prototype that gave between 111 to 113 mpg. We placed an ad in the Brockton Enterprise and the Boston Globe, seeking people to beta test our Fuel Implosion System.

It wasn't long before I got a call from a California corporation wanting exclusive rights to our invention. My attorney checked them out. They were a subsidiary of several other corporations and finally all owned by an oil company. I declined their offer. Shortly thereafter all my troubles started.

First came two men, showing IDs, saying that they were from the FBI and that I was violating federal laws altering carburetion systems and that if convicted could get 20 years in a federal prison. I called my attorney and told him what happened. My attorney informed me that I wasn't in any violation of any federal laws.

If I was smart I should have stopped here. (BUT I AM NOT TOO SMART). For the next two weeks I would receive every day in the mail, in a plain envelope, 8"x10" close-up photos of my wife in the supermarket, church, and my children getting on and off the school bus and in the playground at school.

(Just pictures only.) In addition we would get all kinds of weird calls mostly after 2 a.m. My wife couldn't take it anymore; she filed for divorce and left me.

A few days later my attorney showed up at my office, looking white as a ghost. He had all my legal files and records with him, placed them on my desk and said that he could no longer represent me in any legal matters. I asked why. All he would say is: "WAKE UP!". I could not understand. He had been my personal friend and attorney for over 16 years.

When my wife divorced me and my attorney abandoned me, I wondered what else could happen. Nothing, I thought, nobody can stop me now, so on with my fuel implosion system. Boy was I wrong: hell opened up and swallowed me alive.

I am a very light drinker; if I drink 6 cans of beer a year, that was a lot. I never did drugs or was around anybody that did. On July 4, 1986 the chief of the Brockton Police, Richard Sprawls, with a bunch of other Brockton police raided my Tremont St. Brockton home, and arrested me for trafficking of cocaine. My bail was set at $500,000.

I was lucky that I had a friend, LT. Jim Sullivan of the Brockton Police Department. He showed up at my bail hearing and said something to the judge, and my bail was reduced to $500.00. Is somebody trying to tell me something?

Oh well, back to work; I built two more fuel implosion systems. I installed them in a 1973 Olds Cutlass and 1966 Mustang. I painted my 1973 Dodge station wagon bright yellow, with big red letters all over it saying: "THIS CAR GETS OVER 100 MPG AND DOESN'T POLLUTE THE AIR .THE BIG BOYS ARE TRYING TO MAKE ME AND THIS CAR DISAPPEAR,--HELP ME! " I only got to drive my yellow wagon for 3 days.

On November 24,1986 Brockton chief of police, Richard Sprawls, and other members of the Brockton Police Department raided my Tremont St. Brockton home. They seized two shotguns, a 12-gauge and a 20-gauge, both of which were legally registered to me. I used to use them for skeet shooting.

I was arrested and charged with for trafficking of cocaine again. My bail was revoked. I was placed in maximum security in the Plymouth House of Correction. I was now sentenced to 15 years for the July 1986 trafficking of cocaine and waiting for the second trial for the November case.

I knew where I could get some solid evidence that would clear me, but I didn't know who to trust ANYMORE. So, I escaped from maximum security, went and got my solid evidence and gave it to the right person and surrendered the same day.

Boy I was lucky, they had over 240 law enforcement offers searching for me with guns, dogs, helicopters etc. I ran like a jackrabbit through the woods. My advantage was, the woods were my old hunting grounds.

Two days later Brockton's chief of police was arrested for STEALING COCAINE FROM THE POLICE EVIDENCE LOCKER. HE WAS SENTENCED TO TWO YEARS IN PRISON. REMEMBER THE COCAINE THAT CHIEF RICHARD SPRAWLS SAID HE FOUND AT MY HOME IN JULY AND NOVEMBER 1986? NOW I KNOW WHERE IT CAME FROM, THE POLICE EVIDENCE LOCKER, AND IT FELL OUT OF CHIEF SPRAWL'S POCKET ONTO THE FLOOR IN MY HOME WHERE ANOTHER BROCKTON POLICE OFFICER FOUND IT.

Well, the Massachusetts Supreme Court of Appeals overturned my cocaine trafficking conviction. Grounds: tainted evidence, illegal search and seizure.

FREEDOM AND HOME, HERE I COME! WRONG AGAIN! HERE COMES THE FEDS. THEY HAD A WARRANT FOR MY ARREST FOR VIOLATING A NEW GUN LAW THAT WAS PASSED ON NOVEMBER 24,1986. THAT WAS JUST 10 DAYS AFTER MY ARREST OF November 14,1986. Remember the Brockton police seized my two shotguns?

Guess what? I had the privilege of being the first person in Massachusetts and the third person in the United States to be tried, prosecuted and sentenced under this new law 18 USC 922g and 924e. I didn't stand a chance; there was no case law in the law books to support my defense of this new law.
I was sentenced to two 5 years' sentences for perjury, because when I bought the two shotguns there was a box that said: were you ever convicted of a felony. I checked the no box, because I was never convicted of a felony, just a misdemeanor.

Well, the feds said under federal law my misdemeanor was a felony, therefore, I was guilty of 2 counts of perjury and they gave me 5 years on each count.

Next I got 5 years for being a convicted felon in possession of a firearm. Now I have been sentenced to a total of 15 years in federal prison without parole. I am still sitting in the courtroom. After a week of trial, my attorney said that the US Attorney was trying me under the second part of the new law. My attorney said the trial will be short, won't last more that ten minutes. There was no way I could be found not guilty.

Well, it went like this:

1: I was convicted as a felon in possession of a firearm.
2: I was convicted of perjury.
3: I was convicted of a second count of perjury.

BINGO! I HIT THE JACK POT!!

USC 18922g-e1 states: If you have 3 prior felony convictions and have possession of a fire arm, then you are an ARMED Career Criminal and that carries a minimum mandatory sentence of 15 years without parole. Now I have a total of 30 years in federal prison without parole. Well, the Feds have me tucked away for 30 years where I cannot cause any more trouble with my fuel implosion system. WRONG, WRONG, WRONG:

I met a lot of powerful people in the federal prison, with powerful connections on the outside, among them, Kenny whose son was a patent attorney for a large patent law firm who did our US patent. #5,782,225, while I sat in the safety of the federal prison system.

Remember the Feds sentenced me to 30 years without parole??? Well, on September 13, 1997 (Friday the 13th, my lucky day) I was released from federal prison with 5 years parole.
STOP! Something's wrong here. I only did 10 years of a 30-year sentence, with no chance of parole. Well it took the federal courts to rule that it was legal for me to possess the two shotguns, that they had no jurisdiction. The case is now pending in the 1st District Court. They will not rule on it.

This September 2001 will be 4 years that I have been out of federal prison and have been a good boy, nice and quiet, until now.

My Intentions: In the past 20 years I found out that the oil companies will do EVERYTHING in their power to suppress this kind of technology, because it could reduce the gasoline consumption in the U.S. by 76% over a 5-year term.

The government will lose mega bucks in gasoline taxes.

The major car manufacturers will lose billions spent on the technology of the fuel injection systems, my technology makes theirs obsolete.

I put all my patent and shop drawings up on this website, for anybody to use it free. I am 58 1/2 years young now; the sand is running out of my hour glass fast. I don't want to take this technology to my grave with me. If you think that I should get something out of this, then build my fuel implosion system, and after your 5th tank of gas send me the price of a tank of gas; otherwise I don't want a cent.

If you believe that me and my patent and technology have been suppressed, then tell as many people as you can about my story and ask them to do the same.

The Reason I Ask This Is: I believe that millions of people around the globe want this kind of technology and know it exists. When we get enough people wanting this technology, I have powerful attorneys, who know and are able to present it to the courts of the globe.

I will take my remaining 7 cars, that have my fuel implosion system in them, out of exile and drive them from Boston to California with the whole world watching, and I think my chances of reaching California alive are excellent.

By my publishing this website, I must be out of my mind. What else could happen to me? MAYBE I will get killed or something. What will be will be.

Thank you for your interest. Please help me spread the word. And for those of you that think that my story is just a bunch of bad luck for an unlucky inventor, you will be of those who oppose this type of technology. So go to my home page and VOTE NO for this technology.

Sincerely,
Allen Caggiano, Inventor
http://www.get113to138mpg.com/

P.S.: As much as I would like you to build my Fuel Implosion Vaporization System and succeed, I MUST URGE you NOT to build it without QUALIFIED and PROFESSIONAL help, if you are not a qualified machinist or mechanic yourself. This is NOT a simple D.I.Y project and working with (vaporized) fuel is dangerous!

(The electric auto magazine Electrifying Times (www.electrifyingtimes.com) has published a much longer article on Caggiano and his FIVS in its spring-summer 2006 issue Vol. 10 No. 1. By the way, that particular issue happens to focus on suppressed energy inventions.)

(The following is a subsequent report on Caggiano's on-going suppression troubles.

I just want to inform you as to Allen Caggiano situation. He had the web site www.get113to138mpg.com. He recently was trying to bring out a product. He had a few problems and then disappeared. From what I have been told Allen had been in a hospital recuperating from surgery. He went in to have a CAT scan and woke up a month later without the use of his legs. He said he died twice but came back. He was in a coma most of the month. While recuperating and watching TV one afternoon he saw a SWAT team raiding his apartment seizing his computers, notes, tools and car. The postal service is also investigating because he failed to deliver products. He said there were pressure crack problems. He could not ship and thought things would be redone in time. But just too many things went against him. Even though things look bad for him I still believe he is trying to get this out doing the best he can. I and some others have checked out his stories and had them confirmed. He does have a valid patent for fivs 2 ad. He was framed in his first arrest, and the police chief was dirty. If he were a con artist smart enough to pull this off, he certainly would not be around trying to do what he is doing still. He would be in another country spending the money with another name and ID. For that matter who would use their family name with so many ties and some of the different weird stories have been independently confirmed. His web site is down and I wonder what will come of him. Best way to suppress something is to make it look like a con game. It seems the oil companies are good at that. HIMAC has always tried to help anyone in bringing out this technology. At present we are publishing the work of Tony O'Donnell. He has tripled his fuel mileage, obtained an Australian patent and some foreign patents, but could not afford North American patents and the time ran out. We put out his information research and AutoCAD drawings in a CD format – over 500 pages $39.95 money back if not satisfied. Allen is not the first to get hassled over this. We can only hope he is the last and this information finally surfaces to completion. I only know Allen from phone conversations and the feed back from those who know me. I have not witnessed a verifiable mileage run from him. When I know more it will be posted. (Source: http://www.himacresearch.com/links.html.)

(Erik Masen provides an update in his "Suppression of Quantum Leap Inventors" *Electrifying Times*, 2007, Vol. 10, No. 2)

Recently in our last issue we did a feature story on Allen Caggiano "High Mileage Dreams". Allen had spent a good share of his life developing and selling versions of his high-mileage fuel devices. This feature story covered his many near death experiences by groups who did not want to see his technology go mainstream. Recently some U.S. Government representatives invested in Allen's company in an attempt to shut him down for good. Allen fled to China where he is having his high mileage devices manufactured. Few have heard from him since!

William Bolon: Automobile Steam Engine

William Bolon, Rialto, California, developed an unusual steam engine design in 1971 that was said to get up to 50 miles to the gallon. The engine used only 17 moving parts and weighed less than 50 pounds. It eliminated the usual transmission and drive train in an automobile. After much publicity, the inventor's factory was fire bombed with damages totaling $600,000. Letters to the White House were ignored so the inventor finally gave up and let Indonesian interests have the design.

Shell Oil Company: Achieves 376.59 MPG with a Modified 1959 Opel in 1973

Shell Oil Company wrote "Fuel Economy of the Gasoline Engine" (ISBN 0-470-99132-1); it was published by John Wiley & Sons, New York, in 1977. On page 42 Shell Oil quotes the President of General Motors who in 1929 predicted 80 MPG by 1939. Between pages 221 (see http://www.byronwine.com/files/Shell%20P221.pdf) and 223 (see http://www.byronwine.com/files/Shell%20P222.pdf) Shell writes of their achievements: 49.73 MPG around 1939; 149.95 MPG with a 1947 Studebaker in 1949; 244.35 MPG with a 1959 Fiat 600 in 1968; 376.59 MPG with a modified 1959 Opel in 1973 (photos of these three cars are shown on page 223).

The Library of Congress, in September 1990, did not have a copy of this book. It was missing from their files, of course. [They had it – since it is legally required to have at least one copy of all such publications in the U.S. However, it seems to have been stolen or hidden.] Byron Wine bought a copy from Maryland Book Exchange around 1980 after a professor informed him that it was used as an engineering text at the University of West Virginia.

The modified 376.59 MPG 1959 Opel is now owned by an Alabama antique car restoration company (see http://www.race-cardrivers.com/shop.htm).

Honda: 60 MPG 1992-1994 Honda Civic VX

The U.S. Government, pressured by major US oil and automobile companies, eventually denied import of the 60 MPG 1992-1994 Honda Civic VX. V stands for variable valve timing which can greatly increase a motor's efficiency. (Erik Masen, "Suppression of Quantum Leap Inventors", *Electrifying Times*, 2007, Vol. 10, No. 2)

IPMS-Chernovitsky: Super Ceramics

The I.N. Frantsevich Institute for Problems of Materials Science (I.P.M.S.) is one of more than 70 institutes founded by the government of the Soviet Union during the decade following World War II. Its mission was very simple: the scientists forcibly relocated from post-war Europe and enslaved at the Institute were commissioned to learn everything there is to know about the material world. They were not asked, indeed, they were not permitted, to make any decisions about how their discoveries were to be applied. In fact, from the outset and during all of the ensuing 40 years, there was not a single applications engineer among the 6,600 scientists who worked in the Institute.

The peculiar set of circumstances which provided the essential breeding ground for the extraordinary discoveries spawned by the Institute was not reserved just to I.P.M.S. The central government of U.S.S.R. jealously guarded its absolute right to make all decisions about what was done with the discoveries created in all the institutes. It is not surprising, therefore, that a system of government so paranoid about anyone stealing a pair of shoes that it manufactured left boots in Moscow and right boots in Kiev, would totally fail to recognize or effectively apply the benefits of some startlingly new sciences to clothe, house and feed its own people.

In fact, it was precisely because the Institute was forced to operate in a purely theoretical environment, with no pressure whatever to meet production or marketing deadlines, operating virtually isolated from any contact with the outside world, that the scientists and academicians were able to produce at least 7 whole new sciences, 30 technologies, and 130 materials unknown in the West. It is largely because the most brilliant theoretical physicists in the entire Soviet Union were able to work for nearly 50 years in the singular pursuit of pure research that the sciences developed at I.P.M.S. are so fundamentally unique.

It is interesting to note that only a small part of the new sciences developed at the Institute was revealed to or known by the government of the former Soviet Union prior to its collapse in August, 1991. The antipathy of the Institute's scientists to the USSR government's shabby treatment led them to successfully hide nearly all of their often revolutionary research results.

One of the Institute's four sites, IPMS-Chernovitsky, developed moldable, machine-able, ultra-high temperature, super-hard, and strategic metal-alloyed ceramic substances.

The uniformity and density of ceramic materials is what determines the quality, consistency and persistence of the resonant tone produced by an oscillating crystalline material. Research has created a whole new family of moldable, machine-able, ultra-high temperature, super-hard and strategic metal-alloyed ceramics capable of withstanding operating temperatures of 1200 degrees centigrade. This is more than 400 degrees centigrade higher than can be tolerated by other known ceramic materials commercially available anywhere else in the world, including those manufactured by Allied Signal Corporation and Kyocera.

These materials are being utilized in entirely ceramic internal combustion engines, high-speed turbines and self-lubricating bearing surfaces. The latest ceramic materials designed for use in high-speed jet turbines operate continuously at temperatures in excess of 1200 degrees centigrade. This is more than 400 degrees centigrade higher than the theoretical limit allowed by the quantum mechanics model relied on in the West.

The ceramics produced at the IPMS-Chernovitsky plant have been made harder by fully one factor of hardness than the hardest alloyed metal machine tools currently produced by any other known means of manufacture. They have been made harder by at least one full order of magnitude than either natural or synthetically produced diamonds. Practical applications include drilling and mining, grinding tools, down-hole equipment, tool inserts and the new generation of cubic boron nitride tools that are currently in use.

Proof positive of the extraordinary uniformity and density of these materials is easily verified by a simple demonstration if the measurement of softening temperatures is deemed insufficient. Ceramic pistons manufactured for use in ceramic diesel engines will, when struck by a hard object, produce a clear resonant tone which persists for more than seventeen seconds. This is at least eight seconds longer than the resonant persistence produced by the finest glass or crystal ever manufactured.

Joint ventures of the IPMS with more than a dozen private sector companies to develop inventions have been repeatedly sabotaged by the U.S. Government's Defense Intelligence Agency and others. (Source: David G. Yurth, *The Anthropos Files: Tales of Quantum Physics from Another World – 2nd Edition*, 2007)

Stefan Marinov: Magnetic Vortex Hyper-Ionization Device

At his death Dr. Stefan Marinov was Assistant Professor of Physics at Sofia University, a member of the Physical Institute of the Bulgarian Academy of Science, and the editor of Deutsche Physik. One energy device he was developing was an over-unity magnetic motor.

http://www.spiritofmaat.com/archive/mar2/bearden.htm discloses the strange circumstances of Marinov's death.

(The excerpt below, with editing, is from Vencislav Bujic's report published January 14, 2002.)

Stefan Marinov was working on his magnetic vortex hyper-ionization device just one month before his sudden, unexpected death. There is high chance that his death was connected to the testing of this device, and that it was not a "suicide" as officially stated. Marinov was a good Christian and nobody expected him to commit suicide.

According to official news he presumably jumped off from the top of the four-level outside emergency staircase of the Bibliotheque in Graz, Austria. But nobody actually saw him jumping off. He was still alive, not even bleeding, when an ambulance and police arrived. Marinov died on the way to a hospital.

The police never notified anybody, including his son in Bulgaria. They sealed his apartment, not letting anybody inside, and also refused to release any letters found there, and refused to give any information.

Stefan Marinov was born in Bulgaria. When he got a passport, he moved to Washington. Secret agencies and their 'elite' bosses, who control sources of energy and are confusing people, wouldn't let Marinov alone when he went back to Europe, this time to Italy and Austria. These are the same people who prevented Tesla and many others from giving to all the people sources of free energy. His life was ended abruptly. He had big plans for the future and was making various future collaborations. Marinov had planned to attend the International Physics Conference in Koln, Germany, on 25th of August 1997. He even had made hotel reservations for the conference for him and his colleague Professor P.T. Pappas from Athens, Greece.

Bob Aldrich (Reporter): Vibrating Energy Source

Message 414 DATE/TIME: 05/24/93 01:47
From : BOB ALDRICH -- RECEIVED --
To : JERRY DECKER (SYSOP)
Subject: (R) Bearden's Latest
Folder : A, "Public Mail"

Hi Jerry,

By lamentations I mean lamenting on how difficult it's been to get free energy made available to the people at large. How many people have tried to make it possible over the years? Must have been thousands. Who has succeeded?

Say, did you ever hear of a device that farmers were using possibly fifty years ago that worked on vibration? Apparently some very simple device that when set to vibrating, would put out ample free energy. Chicken farmers and such were building them and using them to power the ranch.

Until some one or two farms mysteriously blew up or burned to the ground, after some warnings. This was in the Midwest to my recollection. The fellow who told me did mention specifics but it was several years ago. He was very hard to pin down as he was always onto the latest thing and didn't want to talk about things in the past much.

Later,
Bob

Dennis Lee: Freon-Based Low-Temperature Phase-Change Engine

Dennis Lee during the mid-1980's developed a freon-based low-temperature phase-change engine similar to Bob Stewart's heat engine. The father of the Boeing 747 and other highly qualified people helped Dennis perfect his engine. A small plant was established in Seattle to produce and sell a commercial home-scale electrical generator. A Seattle area power company (the same one which became infamous for its failed WHOOPS nuclear power plants) campaigned to shut down the plant.

Dennis Lee was forced to move his company to Southern California to start over. He was subsequently imprisoned on a false charge for two years. His book "The Alternative" documents the falsity of the charge. The main point being a two-year imprisonment on a charge using an obscure law *never* used against anyone else in the state for either fine or imprisonment and during which a million dollar bond was demanded by the judge, similar to bail charges issued against murders and violent criminals, not inventors or even petty thieves.

Robert Stewart: Stewart Cycle Heat Engine

Bob Stewart spent $3,000,000 (mostly from farmers) developing patents on his "Stewart Cycle" engines for transportation vehicles and large-scale water lifters for canals during the late 1970's. His efficient and pollution-free engines use ambient heat to expand a working fluid such as ammonia and move pistons through sealed cylinders. He claimed that his low-temperature phase-change engine is more efficient and powerful than Dennis Lee's version.

Twice he built a factory, first in Coeur d-Alene, Idaho, and then in Deming, New Mexico, to make available for sale such valuable and beneficial technology. Both times, the factories were raided and shut down by the U.S. Government's Securities and Exchange Commission.

Through the Las Vegas area grapevine, Stewart fortunately in time heard that a contract on his life was in effect and had to go into hiding for nearly a year.

Jim Powell (Reporter): Flywheel/Dual Hydraulic Cylinder

Date: Tue, 20 Jun 2006
Subject: Great Information!
To: garyvesperman@yahoo.com

Hi Gary,

A friend just forwarded your 25-page e-article entitled History of 'New Energy' Invention Suppression Cases, and I enjoyed the reading. Amazing stuff!

There was one machine (for lack of a better term) I saw back in the mid-seventies that has haunted the back of my mind ever since, and I looked for a mention of it in your article. The article hints you have much more information and files elsewhere. Thought I would share with you what I recollect in case you already know about the contraption I witnessed.

During the mid-seventies I was a long-haul trucker and met an older man at a truck stop in Tennessee. Over cups of coffee we were talking about motors and diesel and mechanical things in general when he mentioned a buddy of his had invented a "perpetual motion machine" that he thought was pretty interesting.

I asked where it was and could I see it. He said the guy didn't live too far from where we were sitting but I would never be able to get my rig up the mountain. He offered to give me a ride. He was right. This buddy lived back in the hills and in Tennessee that can mean a mouthful. Good thing his truck was four wheel drive.

When we got there, his buddy was rather evasive about the whole thing which really puzzled the guy that brought me up there. So he kept asking and pushing for a demo and finally the inventor told us the day before some guys had visited and took a part or two and told him to not fix it or they would be back. I got the feeling that if it had been just me there, he wouldn't have told me anything or showed me anything but because his friend was with me it was different.

He took us out back where there were odds and ends on a workbench, and he quickly gave me a brief explanation of how the parts fit together and how it worked. I am sorry for your sake that I haven't remembered any names of the individuals so if you want to toss my email it is OK. Here is how the description went:

Flywheels by their character tend to develop power once they are in motion and can generate more power while spinning than they consume to keep spinning. Sounds interesting but I am no physics wizard.

So he had rigged a big flywheel between two double-acting hydraulic cylinders with the appropriate switches triggered by the rams to keep the two cylinders reciprocating as long as there was a steady supply of hydraulic oil pressure. The hydraulic oil pressure came from what looked like a modest-sized power-steering pump which was driven by the flywheel.

The flywheel was kept in motion by the moving cylinders, and the cylinders in turn were kept in motion by the switches and the fluid pump. The fluid pump was kept in motion by the flywheel. The switches and support for the flywheel (bearings) was taken during the confiscation by his unpleasant “visitors”.

To start the whole thing in motion he had a small electric motor to help start spinning the flywheel. Once it got up to a certain RPM the electric motor was disengaged and shutdown.

They both told me how he had been using it for various power needs around the farm from pumping water to cutting wood for over a year. When someone told him he should seek a patent for his machine, he followed that advice. Instead of getting a patent, he got the visit the day before I arrived.

I didn't feel like they were pulling my leg but again I know nothing of physics, and I was in my early twenties. There was no appeal to partner, contribute money or support or anything that would have made me suspicious. Wish I could have seen it working because it has kept me wondering the past 30 years.

Perhaps you have heard of these things and can comment on whether it was bunk or not. You may even have the scientific knowledge to instantly recognize its possibility or improbability. Anyway, after reading your article I thought I would pass this along for what it is worth.

Best Regards,
Jim Powell

This writer, Gary Vesperman, does not know of any similar device in the unconventional science literature. Perhaps one of my genius scientist friends can figure out this energy invention. Gosh, do the energy invention suppression bullies even track down energy inventors in remote hillbilly country, take away or damage their machines, and threaten them with death?

Christopher Bird/Walter (Reporter): Energy Suppression – An Invisible Galaxy of Inventions

http://www.spiritofmaat.com/archive/feb2/bird.htm and
http://www.befreetech.com/energysuppression.htm both list 48 energy inventions – nearly all of which are suppressed or at least not being commercially made and sold.

IPMS: Micro-Channels and Filters

The I.N. Frantsevich Institute for Problems of Materials Science (IPMS) was established in Kiev, Ukraine in 1951. Between 1945 and 1955, the government of the Soviet Union created at least 72 self-contained, completely isolated scientific communities like the IPMS scattered all over the most desolate parts of the Soviet empire. Stalin systematically established more than 360 such enclaves as a matter of policy. He deliberately prevented the scientists and their families from co-mingling with the rest of Soviet society or corresponding with the West. This phenomenon of cultural isolation was typical of life in the U.S.S.R. after World War II.

Many of the key scientists who were forcibly expatriated by the Red Army under Stalin's orders and relocated to work in the Institute had been captured by the Soviet armies during the occupation and annexation of Eastern Europe at the end of World War II. Only a handful of them succeeded in escaping to the West. Those who tried to escape were almost always captured and executed. In some cases, their families were sent to languish and die in the Gulags.

Many of the original team of scientists sequestered in L'vov, the entrance to the Institute, had been contemporaries, co-workers and close personal friends with many of the most prominent physicists and other scientists who emigrated to the United States before, during and after World War II.

During World War II in Europe, and afterwards in Stalin's Soviet Union, the original Directors of the Institute experienced the horrors of developing technology for destructive military use. For more than 40 years, scientists at IPMS (and, no doubt, at some of the other Soviet institutes) elected to keep secret as many of their key discoveries as possible until a time when their genius could be constructively applied to solving the global materials, energy consumption and industrial manufacturing issues which are responsible for the current deplorable state of the environment.

Among the original group of scientists relocated to work in the Institute were some who were part of the German team which worked during World War II to develop fissionable nuclear materials, synthetic fuels and foods, and other technological advances for the Third Reich. Information regarding the advanced nature of some of the work they participated in has only recently been declassified and released to the public. Some of the formulas and technologies they developed were absolutely revolutionary and many have never been replicated in the post-war world.

Among recently declassified files is a set of documents which describes the development of infra-red, heat-seeking "smart bombs" which were so effective that a single bomb, dropped by a single Nazi bomber in a night attack in the North Atlantic in 1942, sank a British troop ship carrying more than 3,000 American troops. The bomb recognized and guided itself down the troop ship's smoke stack in much the same way similar devices were observed to function during Operation Desert Storm, nearly 50 years later. The technology which made this device functional was so far advanced beyond anything available to the Allies at the time that the War Department kept the story classified for more than 50 years.

Many of the materials, processes, technologies and applications produced by the Institute are so unique that in some cases there are literally no words in the languages of the Western industrialized nations to describe them.

IPMS has produced a family of micro-channel and filter materials with uniformly controllable orifices as small as .5 micron from combinations of carbon-fiber, basalt, ceramic and strategic metals – including stainless steel, scandium and chromium. These materials demonstrate a consistency of orifices fully a factor of ten times smaller and more consistent than the smallest ever manufactured in the U.S.

These materials have been used in applications for heat exchangers, catalysts and separation of gases on a molecular level. A notable application involves the use of such materials to separate virtually 100% pure CO_2 from hydrogen gas at the well-head from gas wells. Then 98% of the CO_2 can be pumped back into the well for re-pressurization, with the pumps then being operated directly on virtually pure hydrogen fuel.

The scientists, academicians and others at the Institute who developed revolutionary new models of quantum mechanics, quantum physics and the manufacturing processes and techniques which resulted in these materials, refused as a matter of conscience to allow much of what they had developed to pass into the hands of the KGB and the Soviet military.

Joint ventures of the IPMS with more than a dozen private sector companies to develop these useful inventions have been repeatedly sabotaged by the U.S. Government's Defense Intelligence Agency and others. (Source: David G. Yurth, *The Anthropos Files: Tales of Quantum Physics from Another World – 2nd Edition*, 2007)

Viktor Schauberger: Jet-Turbine

During the 1920's Viktor Schauberger designed a novel hydroelectric generator for which he received Austrian Patent No. 117,749 Jet-Turbine on May 10, 1930. It seems that Schauberger actually used a small turbine of this design in a stream of water near the forest wardens' building during those years, but no reliable records are available. An English-language version of his patent is available at http://www.rexresearch.com/schaub/schaub.htm#117749.

Schauberger's jet-turbine does not require the use of a dam. Instead, the water to power it is contained in a vertically oriented large-diameter cylinder, ten feet or more in height. Due to the force of gravity and the elastic modulus (fluid dynamics) of water, a very large amount of potential energy in the storage vessel is converted to kinetic energy as the water is released into the oscillator (impeller). A pump is used to pump the water exiting the turbine back to the storage vessel.

The jet-turbine was estimated to produce 9 times more power for a given water flow than with a conventionally designed water turbine. The design also did not force water through immense pressure and heat which destroy the structure of water.

The water-vortex (jet of water) is produced inside a ribbed copper-cone, by the conical-plus-ribbed shape and gravity, and the resulting water-jet is rolled into the copper-impeller, which turns the generator, producing energy in a silent, effective way. The conical impeller has two or more intertwining spiral grooves incorporated in its outer surface, into which the water emerging from the nozzle is entrained, in order to rotate the shaft of an electrical generator. This method does not require a great deal of water, like conventional water-dam methods, and is absolutely silent.

In practice, only a small fraction of the output energy is required to power the pump, thus making this device a true free energy system. Ideally, the storage vessel should be egg shaped, with the outlet to the oscillating valve possessing the configuration of a long hyperbolic parabola. This outlet configuration will induce a longitudinal vortical motion to the water prior to its flow through the oscillator, thus cooling and densifying the water. The return pipe from the turbine should enter the storage vessel tangentially, in order to assist in the formation of a vortical flow.

In 1986 a group of enthusiasts living around the township of Schladming, who were interested in the practical application of Viktor Schauberger's ideas and Walter Schauberger's mathematics, decided to replicate Schauberger's jet-turbine in order to produce their own electricity. The "Schladming Group" comprised of R. Harbacher, H. Zefferer, H. Schrempf, A. Schwab, T. Promberger, M. Dainhofer, V. Knaus, and H. Mayer.

On the property of one of their members living on the Birnberg, they had carefully constructed the combination of egg and hyperbolic cone, which was sourced from a nearby brook. Water from the stream was fed into the upper part of the egg tangentially, thereby providing the initial impulse for the creation of a vortex. The electricity generator to be attached to the jet-turbine was being specially manufactured. Austrian authorities then told the Schaldming Group to stop their work before experiments were completed, using the excuse that they did not want to see these devices popping up all over the countryside.

Successful or not, what this replication of Schauberger's jet-turbine does show is that small groups of people working together cooperatively can provide their own sources of cheap power and can do much to re-establish their independence from centralized power and control over their lives. The problem that confronts us all, alas, is that it is the centralized electricity authorities who write the rules which ensure as far as possible that no one can escape the power grid. The greater the number of people who are willing to challenge this central control over their independence, the more difficult it will become for those to continue holding such power over us. (Sources: http://peswiki.com/energy/Directory:Suppression and http://peswiki.com/index.php/OS:Jet-Turbine)

Canadian Scientist: Standalone Water-Based Electricity Generator

Jeane Manning authored *The Coming Energy Revolution* and also has co-authored *Suppressed Inventions & Other Discoveries* (an anthology put together by Jonathan Eisen). She has heard numerous stories of suppression during twenty-five years of investigating non-conventional energy inventions. Her website is http://www.changingpower.net. New Energy Congress member Leslie R. Pastor's review of Eisen's anthology: "The book is breathtaking in its openness regarding actual suppression of 'real-time' inventors and innovators."

One story she told Gary Vesperman is about a Canadian scientist. In October of 1999, Manning met him through a mutual friend. According to her notes, he had invented an energy device which was the size of a refrigerator when he ran his home on its electrical output. He wouldn't reveal how it worked, except that it involved sound frequencies, copper plates, water, a transformer and a battery and could be built the size of a Walkman. (Vesperman: This device appears to be similar to the super-efficient water electrolysis devices developed by Daniel Dingel, Ken Rasmussen, and Stanley Meyer (see above). Notice that it offers the desirable feature of being scaleable from very small to at least big enough to run a house off the power grid. It also functions as a standalone generator, not as a less desirable over-unity power converter.)

His mistake had been in being confrontational. He called officials at Ontario's hydro-electric utility and told them to take their meter off of his house. When they arrived and cut off his power, he went down into his basement. While the officials stood out in his yard, the lights inside his house went on again. He came outside and bragged, "I'll put you out of business in six months!" Soon he was visited by men wearing Royal Canadian Mounted Police uniforms who gave him warnings and a document. He later showed the document to his son, a lawyer, who reinforced the message – keep your mouth shut. He dismantled his inventions.

He told Manning that the Royal Canadian Mounted Police basically told him to forget about his invention for thirty years. Twenty-six of those years had passed. He said the police kept an eye on his activities throughout the years. For instance, they interrogated him after an innocent business meeting in California which had nothing to do with the invention.

This German-Canadian scientist joined the many inventors who took their energy secrets to the grave. He was elderly, and Manning believes he died from natural causes.

Brazil: Ethanol Produced from Sugar Cane

Ethanol, produced from fermenting starch-based corn or sugar, is increasingly being blended with gasoline. Prices for ethanol in the United States recently hit an all-time high at over $3 a gallon. To impede competition from ethanol, the oil companies have arranged for the United States to impose a 100% (currently $0.54 per gallon) tariff on ethanol imports, which keeps prices for the alternative fuel artificially high. Brazil, which recently became energy self-sufficient in 2006, is the world's largest producer of sugar-based ethanol and would benefit greatly from a tariff reduction in the United States. Apparently it is cheaper and more energy efficient to produce ethanol from sugar cane than corn. Naturally, Brazilian rainforest preservation advocates likely would argue for running engines on water instead or some other more environmentally benign energy source.

Eric Fry and Kevin Kerr reported July 17, 2007 in *Rude Awakening* (www.agorafinancial.com) that ethanol production now consumes one quarter of the entire American corn crop, boosting the prices of corn and numerous corn-based products such as pork. But ethanol production consumes about as much energy as it delivers...if not more. American corn-based ethanol production relies on large government subsidies as well as huge amounts of fertilizer and fuel. Ethanol also requires prodigious amounts of water from the rapidly shrinking Ogallala Aquifer.

To cash in on the new corn boom, many farmers are continuously planting corn instead of rotating corn with soybean plants. Rotation serves several ecological and agronomic purposes. It makes it more difficult for diseases, weeds and insect pests to persist. The right rotation also builds soil fertility. Soybeans are a natural partner to corn because they capture nitrogen from the atmosphere, leaving more in the soil for the next year's crop. By not using proper rotation practices, farmers will almost inevitably face the prospect of growing corn in nutrient-deficient clay as well as increasing the loss of biological diversity.

By the way, the tariff on imported oil is 0%. External versus internal cost accounting analysis, with its corollary – the thousand-year cost, indicates that it would be fairer and make more sense to encourage conservation and to raise money for protecting Middle East oil sources with a tariff on imported oil.

David Crockett Williams (Reporter): Non-Drug Industrial Hemp as Bio-Fuel

Non-drug industrial hemp is not hallucinogenic marijuana although both are varieties of the same species (Cannabis sativa). Hemp provides a surprising variety of products. More than any other plant on Earth, hemp holds the promise of a sustainable ecology and economy.

Hemp seed is the most complete single food source for human nutrition. Because one acre of hemp produces as much cellulose fiber pulp as 4.1 acres of trees, hemp is the perfect material to replace trees for pressed board, particle board and for concrete construction molds. Hemp made into paper is of higher quality and durability and also is less environmentally damaging to make than paper from wood pulp. For centuries hemp has been processed into high-quality fabrics, sails, ropes, diapers, etc.

Additionally, hemp grown for biomass could fuel a trillion-dollar per year energy industry, while improving air quality and distributing the wealth to rural areas and their surrounding communities, and away from centralized power monopolies. Remarkably, when considered on a planet-wide, climate-wide, soil-wide basis, hemp is at least four and possibly many more times richer in sustainable, renewable biomass/cellulose potential than its nearest rivals on the planet – cornstalks, sugarcane, kenaf trees, etc.

For a comprehensive reference read Robert A. Nelson's thoroughly researched *Hemp Husbandry*, available free online at www.rexresearch.com. The book that started the hemp revolution, "The Emperor Wears No Clothes", has sold more than 600,000 copies to date (to order see http://www.jackherer.com/hemporium.html). Also see http://votehemp.com and http://groups.yahoo.com/group/hemp-reform-act.

Hemp as a bio-fuel poses a possibly insurmountable competitive threat to the fossil fuel companies. Since the days of the American revolution, the U.S. Government proactively encouraged growing of hemp. In order to reverse the U.S. Government's policy and to suppress hemp production, certain large banks and fossil fuel companies eventually were able to fool and stampede the US Congress into legislating a national ban on marijuana (and hemp) in 1937.

The US is the only major industrial nation to prohibit the growing of non-drug industrial hemp.

In spite of increased production and utilization of hemp grown in other countries, and increasingly strident pleas by state legislatures, hemp-related businesses, etc to legalize non-drug industrial hemp, the Bush Administration through the US Food and Drug Administration, working on behalf of the energy cartels and their associated banks, still maintains with an iron grip a fraudulent suppression of hemp disguised as a "war on drugs".

Ironically, the U.S. Government's own Veterans Administration Medical Center in Pueblo, Colorado has conclusively demonstrated (http://brain.web-us.com/alcohol.htm) that a couple of weeks of painless alpha-theta brainwave tuning permanently stops all forms of chronic substance addiction including alcoholism.

David Crockett Williams has submitted June 26, 2006 the following analysis that suggests that discussion of the politics of non-drug industrial hemp suppression should be included as a subset of energy invention suppression politics discussion:

In addition to high-tech energy technologies and inventions that have been suppressed by various means against their developers, one of the most important suppression issues regards the hemp industry for production of bio-fuels to replace the need for fossil fuels.

The main reason why it is very important to include the suppression of the hemp bio-fuel industry in any comprehensive energy technologies suppression discussion is because learning the suppression history about hemp enables people to understand the nature and scope of the ability of industry and government collusion to suppress knowledge – just like the knowledge about the new energy technologies inventions has been suppressed since the time of Nikola Tesla over 100 years ago, by the same greedy industrial monopolists with the help of their bought and paid for politicians.

This is important because otherwise folks studying the data on new energy technologies always wonder how such important information could be kept from the public, "if it is real". The history of hemp suppression explains this with irrefutable historical information now neatly compiled and annotated by folks like Jack Herer and his friends. See http://www.jackherer.com and http://www.myspace.com/hempjack.

Hemp was outlawed in 1937 in a fraud on the US Congress that is still not widely known. After an intentional and racist twenty-year campaign of yellow journalism slandering the "marihuana" becoming popular with blacks in the US after its introduction in the South by Pancho Villa's army's excursions into the US, marijuana was outlawed without telling the Congress it was in fact the hemp plant, the cannabis extract of its flowers being a main ingredient in most all patent medicines for decades before and after the turn of the 20th century.

The American hemp fuel industry was pioneered by Henry Ford who was against the oil monopolies and favored bio-fuels for automobiles. He even grew hemp showing how this was a superior alternative.

But in the early part of the 20th century most of the new industrial monopolists were interconnected by the emerging corrupt banking industry, those who put maximizing profits above all considerations including cost to consumers.

When the cotton gin analog for processing hemp by machine was finally invented in about 1917, this threatened many industries then emerging including the new paper industry begun about 1900 with the discovery of the process using sulfuric acid to bond the lignin in cellulose to enable paper to be made out of trees.

Newspaper magnate William Randolph Hearst was so heavily leveraged into ownership of forests to produce paper for his newspapers that he would have been bankrupted by a strong hemp industry using the new hemp decordicator machine because it takes much less sulfuric acid to make paper from hemp cellulose, and hemp is renewable.

So Hearst orchestrated his yellow journalism for the banks and other emerging industries like the growing petroleum industry, chemicals industry, alcoholic beverage industry, the fiber industry, and the drug industry, perpetrating this fraud on the Congress by outlawing hemp as marijuana. Then began the systematic expunging of the truth about hemp from the historical record and from the educational system in the US, by using the spurious and fallacious "narcotics hysteria" fomented and ongoing since that time.

Before the publication of Jack Herer's book “The Emperor Wears No Clothes” in about 1990 very few people knew about hemp, this suppression campaign being so successful. Since then many people have learned the truth by reading his book and others including Herer’s first editor – Chris Conrad. See http://www.chrisconrad.com.

There has come to be a very strong network of activists by now who know the truth and are working at many well funded levels to correct this situation. They know that the energy industry uses of hemp are important but they do not know much about the new energy technologies or the documentation of their suppression.

So including hemp energy industry suppression in this compilation about suppressed energy technologies will link these two key issues, both of which are needing widespread implementation to address global climate change as per the testimony of experts such as Dr. Brian O'Leary, who has started numerous new energy groups, and Alden Bryant, the grandfather of the UN Climate Stabilization Treaty movement and Earth Regeneration Society. See http://www.brianoleary.com and http://www.earthregenerationsociety.org.

This will afford the already established hemp issue activists the information they need to better open the minds of the American public and to also champion the end to suppression of new energy inventions, because they are fighting against a "drug war" prejudice. By their knowing and showing how the energy inventions are also being suppressed, the public could be awakened to the fact and the nature and scope of this industry-government collusion in suppressing any information that threatens the status quo of contemporary industry.

This will help them overcome the "drug war" as the smokescreen for the prohibition of hemp for all of its uses including energy and to replace the need to cut down so many trees and to re-green the planet to ameliorate climate change.

For an article explaining more about this double-edged sword to cut this Gordian Knot of suppression, the new energy technologies inventions plus a global scale emergency Hemp for Victory campaign, and why both are needed to remedy Earth's current climate crisis, see http://www.angelfire.com/on/GEAR2000/gear.html.

David Crockett Williams, Global Emergency Alert Response 2000
http://www.angelfire.com/on/GEAR2000, http://www.myspace.com/davidcrockettwilliams

Williams recently emailed The Canadian's article "Over 4.5 Billion people could die from Global Warming-related causes by 2012" in http://www.agoracosmopolitan.com/home/Frontpage/2007/01/08/01291.html which explains that the global warming crisis is much more immediate and dire than commonly understood. Western Siberia's 400 billion tons of methane in permafrost hydrate is gradually melting, releasing methane into the atmosphere. The released methane will speed the melting even more, initiating the rapid onset of runaway catastrophic global warming. Methane is more than 20 times as strong a greenhouse gas as carbon dioxide. Even a couple of billion tons of methane being emitted into the atmosphere each year would be catastrophic. For comparison, the atmosphere currently contains only about 3.5 billion tons of methane. 2012 is only five years away! A study by several thousand experts "Global Warming: The Final Verdict" in http://www.truthout.org/docs_2006/012207L.shtml dispels any doubts of a looming global catastrophe.

Dean Warwick: Ampliflaire Efficient Wood-Burning Stove

Dean Warwick's patented Ampliflaire is a major break-through in heating technology and is the only heat exchange process capable of raising combustion cycle efficiency within fuel burning systems. Other systems of heat exchange by their very nature must lower combustion cycle efficiency.

Ampliflaire recovers the heat energy other systems lose. Wherever fuel is burned or heat energy is wasted, there is a unit to resolve the problem, and flue-pipe models, retro-fitted to conventional boilers, convert them into overall effective condensing systems with remarkable savings.

Ampliflaire open fires release the electrical energy in plants, absorbed from the sun during the growing cycle. Grown fuels are the most efficient converters of solar energy, and the burning of grown fuels in this way is the safe way to make available energy from a nuclear reaction.

As hydroxides (OH) of carbon (C), the potential energy in plants far outshines their current use. With the largest man-made forest in Europe, the United Kingdom Government already recognizes a commitment to grown fuel which can easily satisfy British needs. Examples are winter species grass for methane gas, bio-diesel, hydrogen from plants, liquids, and wood replenishing solids.

Ampliflaire reduces heating bills by approximately 90%, reduces pollution, increases property value, removes household dust, eradicates condensation, and efficiently circulates refreshed air.

The company's brochure features numerous practical cases of individual or commercial clients who are now enjoying the benefits of Ampliflaire. From small cottages to large hotels, from churches to business premises, the company has an efficient and effective system available.

Dean Warwick keeled over dead October 7, 2006 in the middle of a Unidentified Flying Object (UFO) conference presentation in Blackpool, UK. Mr. Warwick was an alternative energy pioneer, former U.S. Government officer and intelligence insider who had promised to make some momentous announcements. The circumstances suggest a Central Intelligence Agency (CIA) 'hit' using an Extremely Low Frequency (ELF) weapon. These ELF weapons can be set on a 'delta wave' and are able to shut a person's nervous system down.

Much of this technology has been perfected on the 4th level of the CIA underground Dulce facility in the New Mexico desert. The fourth level of this underground base deals with technological aspects of human aura research, dream manipulation, hypnosis, telepathy and advanced mind control. The ELF weapons 'suck' the life out the victim's body, and Warwick literally 'fell asleep' on his feet. The suspected assassin was followed out of the auditorium by a quick-thinking woman who then observed him laughing as he proudly reported his murderous deed on his cell phone. (Sources: http://www.ampliflaire.co.uk, http://www.thetruthseeker.co.uk/article.asp?id=5337, and http://www.thetruthseeker.co.uk/article.asp?ID=5290)

Idaho Inventor: Advanced Zero-Point Energy Device

During the FBI siege at Ruby Ridge, Idaho, where the FBI shot to death a mother and child during a standoff concerning alleged illegal firearms, an inventor happened to be living and working on an advanced zero-point energy device in northern Idaho.

As the story goes (told to Erik Masen by an investor who was on his way to visit "Inventor X," who had just made a breakthrough in free energy but also, like Howard Rory Johnson, had made the mistake of publicizing his breakthrough on a local TV station):

The day before the investor arrived, two U.S. Government agents broke into the home, thinking that both Inventor X and his wife were away. As it happened, however, X's wife was still home and very familiar with the use of her hefty handgun. She held the agents at bay inside the house, while debunking their story that they were cable TV repairmen checking out the lines.

Had it not been for the siege at Ruby Ridge that day, who knows what else might have happened there. (Excerpted with permission from Erik Masen's article SUPPRESSION FROM HIGHER UP Inventors Beware! The Deadly Campaign Against Free-energy Devices, *Electrifying Times*, Vol. 8 No. 3 and also in http://www.electrifyingtimes.com/erik_masen_suppression.html)

Grant Hudlow: Method of Converting Garbage and Tires to Gasoline, Etc

During the early days of the Reagan Administration, much lip service was given and some money was budgeted to develop alternative sources of energy. Pahrump, Nevada resident Grant Hudlow, a former rocket scientist, was funded to investigate converting garbage, biomass, and tires to gasoline, low-grade heat, fertilizer, and saleable chemicals. His method began to look so promising that the oil companies and their allies in the Reagan Administration got scared and arranged to cut off his research funds. (Source: Gary Vesperman)

Joseph Newman: Energy Machine

In the news some years ago was Joseph Newman's energy machine. While Reagan stalled on acid rain, and Hodel pushed offshore drilling, the U.S. Patent Office continued to block commercial development of this latest of many government-smothered free energy devices. Newman sued the Patent Office for refusing to grant his machine a patent, in violation of its own regulations and the advice of the expert they chose to examine the device. They also issued false statements to the press about the invention's workability.

Over thirty respected electrical engineers, physicists and technical experts have endorsed Newman's machine and signed affidavits confirming his claim of greater energy output than external energy input. Ten congressmen have introduced bills which would require Newman's patent be granted.

As the Newman battle heated up, President Reagan appointed Donald Quigg, a thirty-year Phillips Petroleum executive, to head the U.S. Patent and Trademark Office. The judge entrusted with the case, Thomas P. Jackson, has violated judicial procedure, ignored expert testimony and ordered Newman's prototype confiscated and destroyed. During Watergate, Jackson was the attorney for John Mitchell and the Committee to Re-elect the President's corrupt finance division.

Newman identified the gyroscopic properties of subatomic particles and built a unique arrangement of coils and magnets to draw energy directly from them, thus converting almost immeasurably small amounts of the machine's mass into energy. Theory and device are detailed in "The Energy Machine", $38.45 including postage, from Joseph Newman Publishing Co, Route 1, Box 52, Lucedale, Mississippi 39452; 601-947-7147. Free press releases and brief technical descriptions are also available; send SASE. (Newman's claims and theories do not seem to be universally accepted among mainstream physicists and engineers. Gary Vesperman)

Bill Jenkins (Reporter): Free Energy Machine

BILL JENKINS: Free Energy Machine. Live on Something's Happening. Audio cassette #A1008-90 $9.00.

Bill Jenkins hosted the ABC radio "Open Mind" program for 7 years, the most popular program in the country in its time slot. He dealt with "New Age" topics and was taken off the air. Here he discusses the program and his adventures since, including a near arrest on treason charges for preparing to market a free energy machine.

Volcheck: Engine Powered by Gas with Unusual Expansion Properties

In 1995, a man named Volcheck of Grand Coulee, Washington, made a trip across the United States and back in a car powered by a special gas he developed that had unusual expansion properties. He claimed to have obtained the formula from some unpublished notes of Leonardo Da Vinci.

Volcheck says the gas expands enormously at about 395 degrees Fahrenheit to 450 pounds pressure. In other words, from approximately 390 to 395 degrees Fahrenheit, the gas expands from a volume of one unit to a volume of 10,000 units. He used this gas in a modified Franklin aircraft engine which behaved more like a steam engine. He never refueled during the trip, consuming $10 worth of this special gas.

Soon after his return, some congressmen invited him back to Washington, DC, for a special hearing and congratulatory meeting. While he was gone, U.S. Government federal marshals or a S.W.A.T. team forced entry into his shop, confiscated or destroyed his record-setting car, plans, components, and special gas containers. They subsequently told him to forget any more projects like this.

Gianni A. Dotto: Anti-Aging and Anti-Gravity Thermionic Couple

DATE/TIME: 06/13/93 10:05
From : ROBERT BONNER
To : DAVID MCWHERTER
Subject: (R) UV radiation + us
Folder : A, "Public Mail"

"Dave, There was an Italian researcher (actually he had a Ph.D.) who did research on how magnetic fields affected the body. He made about 3 or 4 classifications of magnetic type energy fields. Two were bad; one had some health benefits but in the long run had detrimental effects. The last one was, of course, the one he speaks of as far as research goes. This person's name was Gianni A. Dotto, born in Venice. His main area of research was "Bio-physics". Anyways, he built something that resembled a thermionic couple. It also levitated too... I said his name "was"; he's dead – murdered some time back. His device worked really well as far as curing cancer goes. And he was killed for it. Run over, several times to ensure his demise. [Details about the Dotto Ring are available online at http://www.rexresearch.com]…

"His ideas on how our DNA is electrically controllable is fascinating. With this device you could theoretically live until you died of an "accident". Once you reach about 40 something, (well, let me put it differently...) Once your body reached 10 base pairs per turn (DNA lingo) you could use the device to SUSTAIN that state of being, anything less than that and you begin to deteriorate. i.e. grow old... Now, if, perhaps, you could find the right setting, maybe you could be 25 forever. But who in the world wants that?!?!

"There were "reverse aging" effects detected on his elderly patients. So this is where all that mess above comes from. It isn't claimed to just be theoretical; he (Dotto) witnessed it. Anyways, I have the document and have read it. Would be cool to build.

"The most expensive piece is the ring part; it is an alloy. But, it would cost about 13 grand to build, maybe less if you knew the right people. It might be worth it for immortality and a life free of cancer and AIDS and the common cold. --- Robert Bonner"

IPMS: Thermal Electric Cooling Devices

The I.N. Frantsevich Institute for Problems of Materials Science (IPMS) was established in Kiev, Ukraine in 1951. It operated in absolute secrecy and was totally unknown to the American intelligence community until just prior to the implosion of the Soviet Union in August of 1991. The mission of the Institute was to use whatever tools or means were necessary to know everything there is to know about materials. They had no production deadlines to contend with, and there was not a single applications engineer in the entire organization.

The 6600 scientists and technicians who worked in the Institute developed an entirely new model of nonlinear quantum mechanics to describe the forces which make the world we live in behave as it does. This new model suggests that the material world is substantially different from the world described by the models relied on in the West. Seven new sciences, twenty-seven new technologies, and one hundred thirty previously unknown materials developed in the Institute are based on the same revolutionary new model of quantum mechanics.

Research and development in the deposition and culture of layered crystal lattices has produced an entirely new class of materials, previously unknown to Western science. These are referred to in recently submitted patent application documents as "Thermal Electric Cooling Devices". Because of the nature and function of a specially designed combination of crystal layered "hosts" and their intercalated "guest" materials, these specially designed capacitors actually absorb energy when subjected to a flow of electrical current, producing a specific cooling effect on the material surfaces. All other known materials produce heat when subjected to the same conditions. Temperatures of 60 degrees Kelvin (-259 degrees Fahrenheit) have been produced under controlled, carefully documented laboratory conditions. This is cold enough to liquefy free-standing nitrogen gas from the atmosphere.

The potential applications for this technology are manifold, but perhaps the most important is the potential it provides to totally eliminate any need for the use of compressed fluorocarbons of all types in refrigeration. Parallel applications in the telecommunications, computer and electronics industries have also been demonstrated to be highly effective and cost efficient, particularly as they relate to the use of super-conductive materials.

Arrangements to commercialize these useful energy inventions by joint ventures of the IPMS and more than a dozen private sector companies have been repeatedly sabotaged by the U.S. Government's Defense Intelligence Agency and others. (Source: David G. Yurth, *The Anthropos Files: Tales of Quantum Physics from Another World – 2nd Edition*, 2007)

Bob Lantz: Lantz Water and Power System

From : "Jerry E. Smith" <jerryesmith@gbis.com>
To : "'Gary Vesperman'" <vman@skylink.net>, "'gear2000@lightspeed.net'" <gear2000@lightspeed.net>, "'halfox@qwest.net'" <halfox@qwest.net>, "'mruppert@copvcia.com'" <mruppert@copvcia.com>
Subject : RE: Lantz needs Reno attorney
Date : Sat, 9 Feb 2002 08:58:07 -0800

Hi, I'm not sure who I'm responding to, so I am sending this to all of you. The only lawyer I know in the area who might be interested in this case is Day Williams of Carson City. He is a civil rights and personal injury lawyer who has represented me in the past (also the late Jim Keith and Sirhan Sirhan!).

Day R. Williams
Attorney at Law
204 N. Minnesota St.
Carson City, NV 89703-4151
775/885-8398
daywillia@aol.com
www.daywilliams.com

I hope this is of some assistance.

Jerry E. Smith
Author, "HAARP: The Ultimate Weapon of the Conspiracy"
(Adventures Unlimited Press, 1998)
http://www.jerryesmith.com

-----Original Message-----
From: Gary Vesperman [SMTP:vman@skylink.net]
Sent: Saturday, February 09, 2002 8:06 AM
To: Jerry E. Smith
Subject: Lantz needs Reno attorney

Jerry, I don't know anything about this, and I am too busy to even read it.

Gary

From : "David Crockett Williams" <gear2000@lightspeed.net>
To : "Hal Fox" <halfox@qwest.net>, "Gary Vesperman" <vman@skylink.net>, "Michael C Ruppert" <mruppert@copvcia.com>
Subject : Urgently need referral to Reno area attorney for Lantz
Date : Fri, 8 Feb 2002 02:16:08 -0800

WWII vet framed by CIA agent to stop energy inventions?

Below is draft of press release I will finalize with Lantz on the phone this morning and send to media lists etc. Please let me know if you can refer an attorney in Reno area who I can phone today to help with Lantz court appearance Monday Feb.11 at which his date to surrender to jail will be set.

From: "David Crockett Williams" <gear2000@lightspeed.net>
Subject: WWII vet framed by CIA agent to stop energy inventions?
Date: Thursday, February 07, 2002 10:06 PM

Seventy-five year old retired chemist and engineer Bob Lantz of Reno, Nevada, fought for the United States as a Navy pilot in WWII, but Monday the U.S. Government is set to imprison him, to "die in prison" according to his "public defenders", in an apparent scheme to suppress his new-energy invention to replace nuclear and fossil fuel power. Perhaps paralleling the case of Horst Jeske, jailed for years in a bogus fraud conviction set up by wired funds transferred by Frederick van Boduncan years after Jeske introduced him to Lantz as a CIA agent, and the case of San Francisco investigative journalist George Williamson who identified Boduncan from his research as a CIA operative previously involved in smuggling drugs into the US via oil rigs in the Gulf.

George Williamson was later named in a lawsuit by Mohamed Al Fayed against the CIA and other government intelligence agencies regarding purported CIA documents Williamson offered to Al Fayed linking the agency with the death of Princess Diana.

Lantz reports Monday for a custody surrender hearing after his sentencing to 5 years imprisonment for a fraud in fact perpetrated without his knowledge by Norbert Vogler of Colorado who forged investment certificates with Lantz' signature notarized by his friend who later acknowledged that Lantz was not present when the forged signatures were notarized -- one of 237 lies that Lantz has documented by Federal prosecutors in his trial after the government put him into poverty by illegally confiscating over $250,000 from him after a raid in 1994.

Why would anyone want to put an old man in jail who is so scrupulously law abiding that he never even got a speeding ticket, someone who accepted the government secrecy order suppressing the Papp Air Engine and therefore cancelled his contract to make Papp's protoype, someone who even calmly accepted the multimillion dollar loss in business due to U.S. Government denial of his permit application to export his water purification Sonofloc System 77 to the government of Egypt for seawater desalination?

Could it be that powerful people within the U.S. government are implementing covert policies to keep new energy inventions suppressed that would threaten the fossil fuel and nuclear power industries? Copious evidence says yes, and that Lantz' troubles really started after he began making new-energy system prototypes for other inventors in 1977 culminating with his 1989 discovery of an "overunity" energy generation system which combines his System 77 with an ultracentrifuge so the overall device not only purifies any kind of water but also produces sufficient heat to produce megawatts of electricity without any fuel at all, perhaps by "tapping the zero-point energy" with a kind of device the US Department of Energy in 1998 called "the Holy Grail of energy research".

How else could it be possible for this bogus fraud case to even be prosecuted after expiration of statute of limitations, with falsified evidence and the apparent collusion of prosecutors who lied and and public defenders who refused to contest the lies and offer documentation of innocence? Why else would Boduncan have brought this "gold certificate scheme" to Lantz as a funding mechanism for his invention?

The Lantz Water and Power System was first tested in 1989. It can solve our global energy and water quality problems.

And what does he get for it? An unacceptable "deal" offered by prosecutors and pushed by two successive public defenders who each claimed he "would die in jail" unless he took the plea bargain acknowledging guilt and forfeiting his assets (over $100k of that confiscated was not even in his name), a "raw deal" which this War Veteran refuses to accept.

Are we to sit by and let this happen or will concerned citizens and media bring his story out so he can get the legal help he needs to get his bogus conviction reversed, his name cleared and his money back so he can pursue development of his New-Energy System?

There is a vault at the US Patent Office containing 5,000 patents ordered secret by the government, confiscated from the inventors who are threatened with 20 years in jail if they release the information as per "dual-use" secrecy law uncovered under Freedom of Information Act and reprinted on p.162 of Jeane Manning's book "*The Coming Energy Revolution*". Her book provides overviews of various energy inventions. Isn't it about time we did something to take this situation under public investigation and control, especially motivated by the current Enron fiasco exemplifying the "ethics" of the fossil fuel industry and government complicity in "rigging" the energy industry?

Can we help Bob Lantz become a hero of this coming energy revolution instead of its casualty? Certainly our surviving WWII veterans deserve better treatment from our country citizens that they love and fought and died for.

Dr. Timothy Trapp: 127 Energy Technologies

Dr. Timothy Trapp, Warren, Ohio, is President of the non-profit company World Improvement Technologies (WITS). A contact email for WITS is wits2011@yahoo.com. They also have another non-profit organization called World Improvement Through The Spirit (WITTS) ministry.

Dr. Trapp called Gary Vesperman June 24, July 1, and again on July 4, 2006 with accompanying emails to provide more details on the companies' activities and suppression history.

Currently employing 11 scientists, WITS has been active in producing, installing and servicing free energy systems worldwide for 19 years. Dr. Trapp and the two non-profits have developed over 127 energy technologies. Approximately 20 utilize cracking water into oxygen and hydrogen, approximately 14 are gravity motors, approximately 50 are radiant energy machines, and the remaining are miscellaneous energy, propulsion and pollution remediation devices.

127 energy technologies are currently commercially available, including large-scale over-unity power plants – 5 megawatts and up. Many of these power plants are under construction in foreign countries but not in the United States due to suppression by the U.S. Government. WITS also makes and sells a device for 30 dollars that can be added to any electrical system that has batteries which would drastically increase the efficiency of that system (e.g. cell phone, radio, electric car).

Dr. Trapp states that if governments were FOR this technology instead of against it, a home-power generator the size of a desktop computer could be built and sold for about the same cost as fuel powered generators or less.

When Dr. Trapp moved back from Alaska, upon arrival, the shipping container containing his tools, equipment, etc., had been emptied. In spring 2001, Trapp's lab in Arizona was raided. At the end of 2001 two WITS scientist assistants were (and currently still are) in Ohio prison on trumped up drug charges.

In the past 20 years the U.S. Government has destroyed over 14 WITTS laboratories. As recently as spring 2006 a WITTS laboratory burned to the ground. The contents of each laboratory contained millions of dollars worth of equipment and several costly free energy machines. Dr. Trapp's laboratories were raided, his equipment was smashed, and his people were beaten and arrested numerous times on false charges. False evidence was planted many times.

After beating up one of his WITTS salesmen, the salesman was then killed by driving the salesman's car off a cliff. Another WITTS employee was also murdered by U.S. Government and so-called law enforcement agents. There have been numerous attempts on the lives of Dr. Trapp as well as many of his associates.

Dr. Trapp wrote "This really should be a wake-up call to the people of America who believe we have religious freedom here. We don't, when it comes to anything that might help the little guy.

On the positive side, with energy prices constantly going up, there is more activity than ever in alternative energy. Power plants are going in many countries. And a few countries are seriously working to get off fossil fuels all together."

From : Jerry Decker <jdecker@keelynet.com>
To : Gary Vesperman <vman@skylink.net>
Subject : Re: Trapp energy suppression
Date : Sun, 23 Dec 2001

Hi Gary! His name is Tim Thrapp.... (Not entirely correct. His name is Dr. Timothy Trapp. Vesperman) he used to live in Alaska. He was the one who told me about Henry Ford working with John Keely to create an arrangement inside early Model Ts so that magnets placed in them would make them self-running....the story goes that Ford was threatened by the oil companies for graft (kickbacks) or something along those lines...so he did this magnet trick as insurance...no one has yet come back with any proof of the claim that SOME Model Ts had these slots in the bell housing where magnets could be placed to make it self-running...here is the file; http://www.keelynet.com/energy/ford.htm (Vesperman: This can not be entirely true. John Keely died in 1898.)

When Tim called me several years ago with that story, he said one of the cars had been found and the engine or a copy of it had been demonstrated, and the inventor killed on his drive home with the engine on a trailer...the engine was stolen... Tim also said he had some radical new power generator capable of 50 kilowatts but he gave no details about it..this was back in 1997....seeya!

Gary Vesperman wrote:

Dear friends, I have received a letter from an energy inventor the following new energy suppression incident: "Tim Trapp, from Ohio, was put in jail by the federal authorities in Arizona and by the state police in Ohio."

Without success I conducted some searches for Tim Trapp on keelynet.com and google.com.

Do any of you know of any authoritative reports on Mr. Trapp's energy suppression troubles?

Gary Vesperman
702-435-7947

Jerry W. Decker - http://www.keelynet.com

Richard Diggs: Liquid Electricity Engine

Richard Diggs, Custom Invention Agency, P.O. Box 11, Carthage, Missouri 64836; patent process on hold, though he has over two hundred others. Diggs developed at an inventors workshop (I.W. International) his "Liquid Electricity Engine" that he believed could power a large truck for 25,000 miles from a single portable unit of his electrical fuel. Liquid electricity violated a number of the well known physical laws that the inventor pointed out. The inventor was also aware of the profound impact the invention could have upon the world's economy – if it could be developed.

David G. Yurth (Reporter): Remediating Nuclear Waste Materials

From: David G. Yurth [mailto:davidyurth@comcast.net]
Sent: Saturday, April 15, 2006 5:27 PM
To: 'STetreault@stephensmedia.com'
Subject: Remediating Nuclear Waste Materials - UNLV

Dear Mr. Tetreault: After reading your article in the Las Vegas Review Journal entitled “Nuclear Project Draws Interest,” I thought it may be of interest to you to know that the DOE has played this game with university and privately funded laboratories for many years. Perhaps the most comprehensive review of this subject ever undertaken was prepared by Mr. Richard Shamp, President of Nuclear Remediation Technologies, headquartered in Hyattsville, Maryland (301) 559-5057.

Beginning in 1997, NRT and its chief scientist S-X Jin [once the highest ranked particle physicist in the People’s Republic of China, until he escaped to the US in 1994 while addressing the Institute of New Energy symposium in Salt Lake City, Utah] have been submitting critical laboratory documents to DOE, demonstrating the effectiveness of known technologies used to remediate radioactive emissions generated by nuclear fuel waste materials in both solid and liquid form.

After being finessed into providing all the definitive laboratory data to Dr. Frank Goldner of DOE’s nuclear remediation division, then-Secretary of DOE Spencer Abraham attempted to confiscate, classify and impound NRT’s technology while at the same time pretending to be considering providing grant money to support its continued development.

The fact that the technology in question had already been awarded six patents [K. Shoulders et al] was the only thing that prevented him from succeeding. Instead of providing grant funding, Dr. Goldner was instructed to put an end to NRT's pursuit of DOE funding for the development and deployment of its technologies. And that is precisely what he did.

During a conference call held on November 15, 2003, I was informed by Goldner that not only did DOE not intend to ever provide any funding to anyone for the purpose of remediating radioactive emissions in spent nuclear fuels, he insisted that it is and will continue to be DOE's policy for the next 40 years to encapsulate and bury every ounce of high-grade nuclear waste material stored in the US under ground at Yucca Mountain.

Further, he told us that any attempt to obtain any high-level nuclear waste materials for testing by anyone, including government funded laboratories, would be arrested and jailed without access to legal counsel under the Export Administration Act. I still don't know what the EAA has to do with remediating radioactive emissions, but that is what he said.

In 1999, while Elliott Richardson was Secretary of DOE, NRT was awarded a discretionary grant of $2,000,000 for the purpose of advancing its test schedule. The work was to have been undertaken in concert with Dr. George Miley, physicist in residence at the University of Illinois at Champaign-Urbana – Dr. Miley's laboratory at the Champaign-Urbana campus was level 2 accredited by DOE, and was therefore acceptable as a test and development site. However, within less than 90 days after the announcement of the grant had been published, pressure from within the Department rose to such extraordinary levels that Secretary Richardson was forced to withdraw the grant, albeit grudgingly.

The only similar technology ever contemporaneously developed in the US for the remediation of radioactive emissions in high-grade nuclear waste materials was developed in the late 1990's by Dr. Paul Brown and his colleagues at World Atomics in Colorado Springs, Colorado. After being granted several patents for the 'Nuclear Spallation Device' he designed, Brown contracted with several Japanese contractors to build three successively powerful prototype versions of his device.

He had them built in Japan because DOE actively intervened more than a dozen times to prevent US companies from building it. The problem with Brown's device was that it was little more than a small, semi-controlled nuclear fission-powered device designed to continuously bombard nuclear waste material targets with a highly charged gamma ray field. Because it was so dangerous to operate, Brown was never able to obtain the necessary State Department or UN transport clearances to have it shipped across international waters into the US for further testing and development.

As you may recall, Dr. Brown was killed shortly thereafter under the most questionable of circumstances, just as the utility of his nuclear spallation technique was about to be publicly demonstrated in Japan.

(Only a month before he died, Dr. Brown met with me, Gary Vesperman, and a few of my business and science associates in Henderson, Nevada to present his method of neutralizing radioactive waste. His method is No. 13 in my list of methods of neutralizing or disposing of radioactive waste in http://iiic.de/docs/GVComparison.htm. A few weeks after Brown's suspicious fatal car accident, Art Rosenblum also died in a car accident. Rosenblum had been enthusiastically promoting Randall Mills' Blacklight Power Inc.'s energy source.)

We have known how to safely remediate radioactive emissions from spent nuclear fuels, both liquid and solid, for nearly a decade. We have the test data and prototype apparatus to prove it. That data, including all the protocols, policies, procedures and experimental design criteria associated with our work have been submitted to DOE many times over – Dick Shamp can tell you all about it if you want to go to the trouble to ask him – with the net result that DOE will not allow the US Postal Service to deliver our proposals any longer. If you want to see what is really going on with nuclear remediation, this is a very good place to begin.

Thanks for writing your article – you're about to find out how big Pandora's box really is.

David G. Yurth, Ph.D.
Director Science and Technology
Nuclear Remediation Technologies, Inc.

(Yurth's letter to Tetreault has not been published in any Las Vegas publication. Why? Maybe to protect the profitable contracts to be generated by the DOE-estimated $150 billion lifecycle cost of the Yucca Mountain Nuclear Waste Repository? Gary Vesperman)

Paul Brown: Hyper-Cap E-Converter

Paul Brown, Ph.D., had invented this device which Gary Vesperman wrote up for his "Advanced Technologies for Foreign Resort Project" (see http://www.icestuff.com/~energy21/advantech.htm).

"Perpetual Battery. The hyper-cap E-converter is a thick quarter-sized battery which would put out .001 watt "forever" for such applications as critical components inside fail-safe computers, cellular telephones, etc. The energy comes from tapping ether fluctuations."

The following is excerpted with permission from "Inventor Paul Brown's Nightmare Story", *Electrifying Times*, Vol. 10, No. 1, www.electrifyingtimes.com. His story originally appeared in Jeane Manning's book "*The Coming Energy Revolution*" www.jeanmanning.com.

Brown invented a novel method for converting natural radioactive decay material into electricity in the form of a battery. In February 1987 the proud inventor and his associates at a private research company in Boise, Idaho, decided it was time to make a public announcement of his discovery.

A series of traumatic events followed. The Idaho state departments of health and finance filed complaints against both the company and Brown. His license for handling radioactive materials was suspended. He began to receive anonymous threats, such as "We will bulldoze your home with your family in it."

Relocating the company to Portland, Oregon, did not stop the troubles. Despite the fact that a 1988 Fortune magazine article commented favorably on the nuclear battery venture, securities fraud charges were filed against Brown and his company. Oregon's finance department investigated, as did the Internal Revenue Service and the Securities and Exchange Commission.

After meeting each challenge, Brown redoubled his efforts to develop his technology, but events worsened. His young wife was assaulted. Even in their home they did not feel safe; it was robbed three times and vandalized on four other occasions. Brown was accused of drug manufacturing and eventually lost control of his company. The Browns' also lost their home. Finally, the pipe bombing of his mother's car in the early 1990s drove Brown to become a recluse.

"I understand now why inventors drop out of society." he said in a 1991 open letter to other new-energy researchers. His advice to them! "Keep a low profile until you have completed your endeavor, be selective in choosing your business partners, protect yourself and your family, and know that the nightmare stories are true." Brown eventually died in a suspicious car accident in April 2002.

Ira Einhorn: Free Energy and Mind Control Researcher

(Excerpted from "A Snapshot of my 70's" by Ira Einhorn, September 1, 2002)

… What Geller could do, I saw a lot of it first hand, indicated that the basic physical framework in which physics operated was inadequate and that so called "free energy" devices -- devices that would solve our energy problem and end what is now called global warming and allow for the decentralization of most economic activities -- could become a reality. Hence I circulated all previously known anti-gravity information and all the emerging work on "free energy" devices.

Unfortunately, all new technology can be used as weaponry as well as for human benefit. So, I was soon up to my ears in a multi-pronged intelligence game that is still waiting to be unraveled…

… So when the opportunity arose, after a series of dinners and meetings in Princeton and New York with Bogdon Maglich, the head of Migma Fusion, the only private nuclear fusion research operation in the United States, and a number of Yugoslavian government officials, I agreed to help organize a large Tesla celebration. To this end, I enlisted the support of the president of the prestigious Franklin Institute in Philadelphia, Bowen Dees, and after a stint at Harvard and with the blessing of the Yugoslavian Consul-General in New York, I went off to Yugoslavia, to spend days at their expense, as an unofficial ambassador.

I was planning to do many things during this celebratory conference that would have linked the Tesla Museum in Beograd with the Franklin Institute in Philadelphia: besides giving Tesla his just due and showcasing his achievements in a major exhibit at the Franklin Institute, while holding a major international conference on his works, I would also have organized a smaller conference on the suppressed aspects of his work in mind control and free energy and found a way to directly demonstrate mind control to those who came to the conference.

In the fall of 1978 I was a Fellow in Residence at the Institute of Politics within the Kennedy School at Harvard. I taught one course, ran a small lunch time chat series in which Harvard luminaries, Ambassador Reichauer, E. D. Wilson and Karl Deutsch, among others, ate and chatted with 5 or 6 of us for a couple of hours; I lectured in every conceivable venue at Harvard, conducted a number of public symposiums, brought a number of the members of my Network to Harvard to lecture, ate dinner with a host of well known political figures, and made an inordinate amount of noise about mind control technology and the Russian Woodpecker to, among others, then CIA head Stansfield Turner. This lead to a meeting in the Boston Airport, arranged by one of JFK's chief aides, on the matter with a top defense intelligence scientist who ended up spending the evening with me and giving me his home telephone number.

In 1979 I received a small private foundation grant to study free energy devices in preparation for a large involvement in such activities. I was planning to visit all of the inventors personally and then prepare a report that would have formed the basis of a venture capital enterprise that had been encouraged, due to some of my mailings, by a number of my affluent friends. The objective was to develop and bring one device to the marketplace…

…All was not to be. I was busted for a murder I did not commit, and all my work on mind control and free energy became history. [signed] Ira Einhorn September 1, 2002

The following is excerpted from Ira Einhorn's July 5, 2002 email:

Robert Eringer proposed all kinds of book schemes for me; schemes in which I was not interested. Nor did I find any of the people my agent sent to me, re: the biography, to be of interest. Thus when Eringer suggested he would like to look at my fourth novel, Cantor Dust, which was near and dear to my heart, I informed my agent and sent it to him. Eringer was very enthusiastic about it. He said he would prefer to do my autobiography, but would work on getting my novel published as an opener to getting my autobiography. I said he was welcome to try. Thus began a continuous stream of many hundreds of e-mails between this alleged intelligence operative and myself, broken only by his journeys to England, wherein he told me he saw a number of publishers without success and one new house that agreed to publish Cantor Dust when they were actually in business, and his family vacations. We were still at it the day I was extradited to the United States: July 20, 2001… [Deleted]…

One of Robert Eringer's closest associates is Claire E. George, past Deputy Director of Operations for the CIA, in charge of covert operations for the entire planet. Sources who have researched the situation indicate that Claire E. George and Robert Eringer have worked together on a number of operations, still work together and have a pile of money at their disposal.

Einhorn presents the highlights of his case in http://groups.yahoo.com/group/Ira-Einhorn/message/454.

"We'll know our disinformation program is complete when everything the American public believes is false." -- William Casey, CIA Director (from first staff meeting, 1981) (Source: THE BROTHER JONATHAN GAZETTE DAILY DIGEST Wednesday June 28, 2006.)

How much is good press worth? To the Bush administration, about $1.6 billion. That's how much seven federal departments spent from 2003 through the second quarter of 2005 on 343 contracts with public relations firms, advertising agencies, media organizations and individuals. (Washington Post; Feb. 14, 2006) (Source: http://www.washingtonpost.com/wp-dyn/content/article/2006/02/13/AR2006021301897.html?nav=hcmodule)

Thomas Henry Moray: Radiant Energy Pump/Electricity Generator

Thomas Henry Moray, Ph.D., (August 28, 1892 - May, 1974) was an inventor from Salt Lake City, Utah. Moray graduated from The Latter Day Saint's Business College. Moray studied electrical engineering through an international correspondence school course. He received a Ph.D. in electrical engineering from the University of Uppsala.

T. Henry Moray's research dates from the time he was 9 years old (1901). Over the 73 years of Moray's research, he left behind him a wealth of notes, not only pertaining to radiant energy, but a wide range of scientific research bordering all the way from the devulcanization of rubber, the influence of mineral reactions in the presence of high energy, bio-electronic effects (electrotherapy), sound pick up, solid-state physics, and finally the detection of energy that constituted the major endeavor of his work.

Moray was a pioneer in the field of electrical energy. As a youth he greatly admired Nikola Tesla and in particular was very interested in Tesla's obsession with the earth having a limitless supply of energy available to it from the universe. Like Tesla, Moray wanted to find out how to tap this energy. Like a lot of people he became amazed at the "crystal radio" where a crystal can be tapped with a fine wire to make a radio work – without any battery or power. Moray figured that if this was possible it should be possible to find a crystal (or "magnetic rock") that could be tapped for a power source.

Moray became very interested in the properties of certain rocks and crystal structures and the powders from them. He actually developed and utilized a transistor more than 20 years before anyone ever dreamed of such things. These solid materials are what he made his so-called Moray valves out of; they were like radio valves *but were not using a heated coil* like radio valves (also known as vacuum tubes in today's terminology). They were all cold with no external power to feed them. They were a mixture of semi-conducting materials and intricate one-way conducting materials (diodes in today's terminology). The Moray valve was therefore a solid-state device – unlike a radio valve that heated a plate to produce energy.

It is well documented that Moray developed a bipolar semiconductor as early as 1927. His germanium "valve" was working in 1931. In the 1930s Moray developed advanced semiconductors and transistor-like devices.

Moray provided a complete disclosure of his semi-conductor research to Dr. Harvey Fletcher of the Bell Laboratories. Dr. Fletcher later became head of the department at Bell Laboratories that developed the transistor. Moray, therefore, could be the true father of modern electronics since his work predated the Bell Laboratory bipolar transistor findings by at least 20 years.

During the 1930's T. Henry Moray was refused a patent on his cold semiconductor cathode because the patent examiner couldn't understand how it could emit electrons. The patent examiner reported that he could not allow the patent because he could not see how it would work since "the cathode had no means of being heated".

"He tried to patent his device, but the requests were denied because the item he called the "Moray valve' was too new a thought for the patent examiner. It was actually a germanium transistor, and solid states were unknown at the time." his son John Moray said. 20 years later the development of the transistor apparently proved that his device could actually have worked.

Both Nikola Tesla and Thomas Henry Moray consider harnessing cosmic energy (vacuum or zero point energy in today's terminology) as the most practical method of producing energy yet discovered by man. Furthermore, they thought it is possible to utilize this vast source of energy from the universe without a prime mover at any point on the earth or in space – on the ground, in the air, on the water, under the water, or even underground.

Radiant energy is energy that is transported by waves. This includes energy transmission in the form of waves through space or various media. Radiant energy is also energy transferred through electromagnetic waves. Solar energy is a type of radiant energy. Radiant energy is the sum total of all the energy that comes to the earth from all the universe. The earth also reflects back radiant energy into the universe. Our sun directs electrically charged particles towards us. Radiant energy may be calculated by integrating or summing radiant power with respect to time. Radiant energy is usually expressed in joules.

During the 1920s Moray demonstrated a "radiant energy device" to many people who were unable to find a hidden power supply or batteries. Moray called his device a solid-state detector or the "Moray valve". It basically comprised of a large antenna connected to a complex series of high-voltage capacitors, transformers, and semiconductors. By supposedly stimulating the existing oscillations of radiant energy from space, his device could generate electrical power without any man-made power input. By 1936, Moray had eventually engineered his device so that a 55-kilogram version could constantly produce 50 kilowatts of power for several days.

An electrical generator may be considered as not in the true sense a generator – as electricity is not made by the generator – but is merely an electrical pump. Moray's radiant energy device may then be referred to as a cosmic ray pump: that is, a high-speed electron oscillator serving as a detector of cosmic radiations which causes a pumping action or surging within its circuitry. Moray used the term "radiant energy" to describe that source of energy coming from the cosmos to earth and radiating from the earth back to where it came. This is the energy the Moray device captures and could be described as those particles of energy pervading all space.

What sort of an apparatus is Moray's radiant energy device? Briefly, it would appear to be similar to a radio receiving set of power proportions.

An antenna is connected to a 29-stage solid-state collector material; a small rounded pellet mixture of triboluminescent zinc, a semiconductor material, a radioactive or fissile material, and germanium. The device contains two coils of wire, or inductances. It also contains several condensers, or capacitors, of different sizes. There is a detector tube, or electronic valve, and two oscillator tubes. Added to this is a "bar of silver and a bar of copper", a starting device, and a step-down electrical transformer, reported to be 1000-to-1, primary to secondary.

After tuning of the device the semiconductor material acts as a one-way gate (diode in modern terminology) for surges of high-frequency background atomic ion energy which can go through the material more readily in one direction than the other. For conversion of ionic to electromagnetic energy to then be transformed into useful electrical power by conventional radio circuitry and a transformer, the device must be grounded.

All of this was enclosed in a box measuring about 30 inches long by 16 inches wide by 16 inches high. It weighed about 30 kilograms. There were no moving parts. Moray said there are no dangerous radiations surrounding the box when it is in operation.

Moray's 30-kilogram radiant energy device produced 4 kilowatts of cold electricity which was able to power light bulbs. However, electric motors require special winding to increase their efficiency. While commercially available electric motors will operate on the power from a radiant energy device, they are not as efficient as motors running on ordinary commercial currents. Moray says when his motors are running in the dark they glow with a violet aura. His motors ran cold!

It has been estimated that using current dielectric technology that a 50-kilogram radiant energy device could be built to produce 300 kilowatts – sufficient to power buildings and also electric vehicles.

Some persons who have seen radiant energy power lights say the bulbs look as if they were filled entirely with white light, as if the gas itself which fill the bulbs were fully incandescent. Moray believes this to be true.

Radiant energy will heat electric flat irons and other electrical heating devices. It is claimed heating capacities are reached much more quickly with radiant energy than with commercial currents, and are considerably hotter than when powered with ordinary electric energy.

One photograph shows Moray demonstrating his generator as it powers 50 100-watt light bulbs and a 655-watt Hotpoint iron. Thus he proved that his radiant energy device was not running off batteries – as his detractors said it did.

By 1936 he had developed a generating unit that weighed about 55 pounds and was capable of producing as much as 50 kilowatts of power on a steady basis.

On several hundred occasions Dr. Moray lighted a bank of 35 light bulbs with power from his simple but ingenious radiant energy device. There were 20 150-watt bulbs on the panel. At the same time the generator powered a 600-watt glow heater and a 575-watt flat iron.

Moray, as Nikola Tesla before him, was unsuccessful in introducing his devices working on this principle. Some report that his secret was forgotten. Moray tried for several patents to no avail.

These valves are ONE reason why patents were continually refused – as he was told "there is no such thing as free energy".

"You must put energy in to get it out." As patents were applied for, there were refusals due to the fact that the patent applied for "infringed other patents". Even thought Moray patiently wrote details of how this could not be, the US Patent Office refused to allow any.

On the other hand, Moray gradually had perfected his device's output from a capacity to light one small incandescent light bulb to a present capacity claimed to be 50 kilowatts. Fifty kilowatts represents about 67 horsepower and, certainly, 67 horsepower is not to be disregarded. Many small factories do not use as much as 67 horsepower.

According to Moray, one of his radiant energy devices can be built for about $800 (year is unknown as there has been considerable inflation). Mass production methods might cut this price in half. Under these circumstances, a unit in a home would bring about a substantial saving in power bills over several years time.

As many as 100 persons have witnessed radiant energy demonstrations. Radiant energy, as it emerges from the Moray apparatus, may be considered a form of electricity. It is an alternating current, but an alternating current of very high frequency.

If a photograph of a single bulb lighted with radiant energy is taken the print shows a large, dark ring, perpendicular to the base of the bulb. This ring looks like a circle of translucent black fog. It seems the light somehow reflects itself on the air, or projects a shadow of itself there.

The demonstrations attracted newspapers and scientists from Bell Laboratories and from the Department of Agriculture, but none could attest to how the device actually operated nor could evidence of fraud be found. Even though eminent scientists examined his device during and after its operation, and admitted that they could not understand the source of the power they had witnessed, still he was never able to gain their support for his work.

Moray refused to sell his technology to corporate interests, fearing its misuse.

In the later 1930's engineers from the Rural Electrification Administration (REA) were ordered to work with him by President Franklin Delano Roosevelt. A controversy grew between the inventor and the government engineers. As a result Dr. Moray charged that the REA was trying to sabotage his work.

Moray reported that he and his family had been threatened and shot at on several occasions. His laboratory was ransacked to stop his research and public demonstrations. Repeated assassination attempts were made against his life. It was necessary for him to bulletproof his automobile since he was shot at while driving down the public street. Small wonder that Moray developed an extremely alert and suspicious nature, and visitors to his desk often noticed a fully loaded pistol lying on the desktop within easy reach of his hand!

In 1940 Moray demonstrated before the members of the Public Utilities Commission (in Utah?) his free energy generator. It maintained a continuous output of 250,000 volts with no apparent input.

The next day Moray was found shot in his lab, and all of his notes were stolen. Moray had been wounded by shotgun pellets in his lab by an attempt to frighten him into handing over the secrets of his work. Except for his own skill with a pistol to successfully defend himself against his assailants, Moray would have been murdered.

An REA engineer named Felix Frazer who was Moray's assistant had gone berserk and smashed the Moray device with an axe. It was never rebuilt. The frustrated inventor could not afford to duplicate his invention. He went to his grave many years later convinced that the destruction of his device was part of a communist plot. Frazer apparently was angered that Moray would not sell his device to corporate interests.

There is a rumor that to stop the USSR getting this technology the equipment was destroyed by Moray's assistant. Or, the equipment was destroyed because Moray refused to unconditionally hand over all aspects of the devices he had built. It was further claimed that one of his sons dumped the entire contents of Moray's laboratory into a river – because of continued threats and harassment – not only to himself but to his family as well.

The entire truth may never be known, but it is a fact that Fraser became enraged and grabbed a sledgehammer and smashed Dr. Moray's device to pieces.

"Dad believed to his dying day it was all part of a communist plot," John Moray said. "He had refused to cooperate with certain known communists so his invention paid the price," Moray added.

"It certainly smacks of some kind of conspiracy," the younger Moray mused.

The tragedy of it all was in the fact that Dr. Moray's years of research and development, and his entire fortune were wiped out when his device was smashed with a sledgehammer. It had taken Moray 20 years and $200,000 of his own money to develop it.

"Because of the expense and hardship in rebuilding the generator, which the patent office had refused to consider, my father never actually completed more than one unit at a time as he perfected it.

"Each updated model used parts from the previous model as he made improvements in successive stages."

Another factor in the total destruction of this marvelous technology was the demise of the various companies that provided Dr. Moray with components. Both the Great Western Radio Co. and the Baldwin Electric Co., which he worked with vanished as part of his resources.

"Inflation, the massive war effort and threats to my father's life spelled doom to any ideas he may have had for replacing the destroyed generator device," the younger Moray claimed. However, more than $200,000 in the late 1920's and early 1930's would indeed translate into many millions today.

Make no mistake about it; Dr. Moray did what he claimed to have done. He had achieved free energy. The Soviet Union even offered to provide him his own fully equipped laboratory in Russia, with no expense spared, and to back his experiments fully. Fraser could have been a trained Soviet agent who had succeeded in working his way into Moray's confidence and gaining access to Moray's laboratory as a technician and assistant. When Moray still refused to give his invention and services to the Soviet Union, the assistant destroyed the device, smashing it to pieces with a sledgehammer.

Sadly, T. Henry Moray died with his dream unrealized and the original device destroyed.

Walter Rosenthal (Reporter): Small Electrical Power Converter

Walter Rosenthal was a retired aerospace engineer with some test equipment such as oscilloscope and voltmeters. He had closely followed for a long time development of new sources of energy and personally knew some energy inventors. (Rosenthal recently passed on from natural causes. He received much praise for his careful energy invention measurements. See for example Thomas E. Bearden's eulogy in http://peswiki.com/index.php/Site:LRP:Tom_Bearden_Remembers_Walter_Rosenthal_%26_Floyd_Sweet)

More than twenty years ago, Rosenthal became involved with an inventor's invention of a small electrical power converter. Something about converting a flashlight battery's DC to 4 watts of power with a high conversion gain. He realizes now that it would be a very valuable invention because it could be used in cell phones, laptop computers, portable radios, etc.

Then the inventor got a call from a man representing Atlantic Richfield (now ARCO). They offered the inventor $40,000 to take it off the market. Otherwise, they would subject him to troubles, etc. He refused. They eventually offered $400,000.

One day he came home to find a group of men going through his apartment. He asked them to leave, and has had no further confrontations. He has not done any further development work on this device. Perhaps consequently, as of a few months ago, he was still alive and well. That energy device is still not on the market.

Later on, Rosenthal figured out that the Atlantic Richfield people could only have known details about the invention by tapping either his or the inventor's telephone.

Joseph C. Yater: Heat-to-Electricity Converter

In September 18, 1975 Joseph C. Yater invented a heat-to-electricity converter that he says will cost the consumer approximately $200 and would be up to 90% efficient. The device operates by capturing "fluctuation voltage" (the static noise heard on radios and amplifiers). The rooftop device would be heated by the sun and use millions of microcircuits to tap the freed electrons from heated molecules. Yater took his device to the U.S. Government, which declared that his device had "real potential". After promising him a working model within 6 months, the U.S. Government came back to him with the reply that the device would be impractical. Subsequent scientific analysis also revealed flaws in Yater's reasoning.

Adam Trombly: Trombly-Kahn Closed-Path Homopolar Generator

During the early 1980's Adam Trombly and Joseph Kahn, Ph.D., co-invented the Trombly-Khan closed-path homopolar generator which has an output power exceeding its power input by a factor of 4.92. The patent application and drawings represent the result of the expenditure of $290,000 in two phases. Their US patent application was rejected twice on the grounds of impossibility that the machine could work. Then the United States Patent Office notified the Department of Defense. Instead of congratulations, Trombly and Kahn received a secrecy order. The two authors were warned not to publish any information on the basis of violation of secret homopolar generator work being done concurrently in the U.S. Government's Department of Defense.

Adam Trombly, the senior designer of the machine, received two written gag orders from the Department of Defense – forbidding him to reveal details of the machine – upon threat of 10 years imprisonment for violating security relating to homopolar generator design. The DOD-imposed secrecy has prevented any recompense whatsoever from accruing to the men who performed this work.

According to information obtained under the Freedom of Information act by the Federation of American Scientists, the Pentagon placed 774 patent applications under secrecy orders in 1991 – up from 290 in 1979 – and 506 of these orders were imposed on inventions by private companies. The U.S. Government has standing gag orders on several thousand inventions.

In 1989 Adam Trombly proposed the retrofitting of the Four Corners coal-fired power plant with an advanced Trombly-Khan closed path homopolar motor-generator. Trombly and Farnsworth estimated that the cost of such an advanced electrical generator to be approximately the cost of installing smoke scrubbers on one coal-fired generating unit. (Sources: http://www.rexresearch.com/trombly/trombly.htm and http://www.broandrew.com/suppression.html.)

Adam Trombly: Trombly-Farnsworth Solid-State Oscillating EM System

Adam Trombly also co-invented with David Farnsworth the Trombly-Farnsworth solid-state oscillating electromagnetic (EM) system. In June of 1989 Adam Trombly and David Farnsworth of Zero Point Technologies, Inc., demonstrated a solid-state resonant device which physically produced over fifty times greater electrical output than input at the Church of the Holy Covenant just prior to a major address by Trombly at Dag Hammarskjöld Auditorium in the United Nations. The demonstration had originally been scheduled to coincide with Trombly's address.

But at the last minute Trombly and Farnsworth were informed by the Director of the United Nations Environment Programme, Noel Brown, that United Nations Security personnel refused to allow the demonstration in the Auditorium for security reasons. (The Church of the Holy Covenant was no longer used as a church but was used by the United Nations as an alternate venue for the demonstration of "sensitive" technologies such as that belonging to Trombly and Farnsworth.)

The demonstration was attended by fifty people including five major Wall Street executives, several engineers, and a Senior Engineer from Boeing Corporation Dr. Charles (Chuck) Clark. Clark had been allowed to spend several hours alone with the technology prior to the New York demonstration. Clark had checked for every conceivable trick that might be used to deceive naïve or unwitting observers.

The demonstration went perfectly. Many present stated that they felt they had attended a historical event; one that would help the human species emerge from the economically stratified and earth destroying dark ages of fossil fuel technology and into a time of universal, pollution-free electrical power. Some participants/observers were moved to tears by the ramifications of what they had witnessed.

After the demonstration the entire entourage proceeded to Dag Hammarskjöld Auditorium where Trombly addressed the standing room only crowd. He asked all of the witnesses to stand, and they did.

He then asked Dr. Clark to comment on what he had seen. Chuck said, "I am not here representing Boeing. I am here because I was hired to find out if this technology really works. I can't tell you how this thing works. David and Adam can explain that better than me. What I can tell you is that it does work exactly as Adam has just said. I have checked for every trick in the book, and all I can say is that this works."

There was a stunned air in the room. When Trombly finished there was a long standing ovation which was followed by a very long walk from the front of the Auditorium to the entry foyer. One senior diplomat called it “One of the longest standing ovations in the history of the UN.”

There were just so many people from all over the world expressing their excitement that it took nearly forty-five minutes for Adam to get through. By the time he reached the foyer he saw the five Wall Street executives were huddled up with a man whom Adam had introduced the day before as one of his best friends. They looked anything but happy. As Adam approached, one of them took him aside and said, "Your friend just told us that you faked the demonstration. Is that true?"

"Are you kidding? My entire life has led up to this moment. The future of this planet will depend on the development and deployment of these technologies if we are to have any hope of surviving the hell we are currently creating for ourselves." Adam was stunned.

"I do not know what his motivation is for saying that. He is not a scientist nor is he an engineer. It just doesn't make any sense."

"Well, you said he was one of your best friends. So you have to understand that our commitment of $500,000,000 is withdrawn until we can sort this out."

In an instant one man had obstructed history for us all. He misrepresented the truth even after the real professionals had agreed that the technology worked, and that there were no tricks. Adam later realized that this individual had cleverly infiltrated his life and won his confidence. He had torpedoed the future.

Adam did hours of interviews that afternoon and into the evening. Dr. John Lilly also asked to be interviewed. He said, "This is the most wonderful and exciting thing I have ever seen! I am coming out of retirement to help Adam promote this thing. Maybe we do have a future that’s worth living in after all."

The following Monday Trombly and Farnsworth presented a similar demonstration to some Congressional representatives in the US Senate Banking and Finance Committee Hearing Room. After the Congressional demonstration, Trombly commented: “Here is a technology that points to a better future; a future free of the taint that the politics of scarcity casts upon us all.”

After these demonstrations Trombly indicated that he had so far survived 47 assassination attempts over this technology which apparently threatens existing energy industry monopolies.

While David Farnsworth was in their $20 million Oregon shop/lab, early one March morning in 1994, badge-wearing US Marshals broke in with sledgehammers and chainsaws. Farnsworth watched with his wife and a friend from a motor home while they ransacked his lab and took the energy machines away.

They recklessly removed expensive electrical devices including expensive spectrum analyzers, earthquake forecasting devices and advanced generating equipment away from walls and shelves. They carelessly stacked them in waiting trucks and vans to be transported to a federal warehouse in north Portland.

The supposedly law-abiding U.S. Government employees also took home thousands of dollars of Farnsworth’s expensive ham radio equipment.

The US Marshals then filed charges against David Farnsworth and took him to court. Eventually, those charges were dropped.

Adam Trombly has had a total of 54 attempts on his life. One of the latest occurred early in 2006. Also, a suspicious incident occurred July 4, 2006 when Trombly was visited at his Aspen, Colorado home by a man of Middle East origin from Las Vegas who knocked on his door and earnestly tried to give him ten free cases of meat. Having been previously forewarned, Trombly refused, even after an additional offer of a free freezer, fearing the meat had been poisoned. This incident indicates that an energy invention suppression hit squad might be based in Las Vegas.

(References: June-December 2006 emails by Adam Trombly and Bruce Meland to Gary Vesperman. "In Search of Quantum Motors and Generators" by Bruce Meland, *Electrifying Times*, Spring-Summer 2006, Vol. 10, No. 1, www.electrifyingtimes.com. The book "*The Coming Energy Revolution*" by Jeane Manning. Tom Bearden's web site www.cheniere.org/correspondence/080301.htm.)

Gary Vesperman: My Car was Fire Bombed July 3, 2006

John Martens and I share the rent on a house in a nice, relatively crime-free neighborhood in Henderson, Nevada. The evening of July 3, John rode home on his bicycle at 9:45 p.m. The streets were quiet with no one walking in our neighborhood. He left on his bicycle 15 minutes later in a different direction. He still sees no people around. He does recall having a spooky feeling that someone was watching him leave and looked back a couple of times as he was riding away.

At 10:15 p.m. I went to bed and shut off my bedroom light which can be seen from the street. A few minutes later John's dog Coyote started barking. I let her bark for a couple of minutes hoping she will stop. I got up, looked out the front door, and could see what appeared to be fireworks burning in the street behind the car. I walked to the car, looked in the rear window, and saw the bottom of the back of the driver's seat burning!

I ran back into the house, called 9-1-1 and reported my car on fire. The firemen came later than I thought they would and with an iron bar proceeded to break all four door windows, even the two small windows in the two rear doors. I had jangled the car keys in front of them when they had arrived. They then found that the driver's side door was unlocked and sprayed water on the burning driver's seat to put out the fire.

They told me to wait for their arson investigator. He found on the driver's seat the carcass of an incendiary fire bomb three inches long and an inch wide. He said it burns at 2000 degrees.

The next day, being July 4, I asked two fireworks sales stands about it. It is illegal in Clark County where Las Vegas is located. It can be bought at Indian reservations fifty miles north. It appears whoever threw the firebomb in my car knew what he or she was doing.

I asked my mailman who has been delivering mail in my up-scale neighborhood for over ten years. He said he has NEVER seen a car torched in our neighborhood during all those years. My car is only one of numerous vehicles parked in our neighborhood. Yet my car, which is registered in my name, was the one targeted.

The car is a 1991 Chevrolet Corsica which had been painted, its interior in good shape, and has a fuel-efficient strong power train with new tires and many new parts such as new brakes, muffler, etc. It would have been a nice high-mileage reliable car for several years. In addition to the firemen breaking all the door windows, the roof lining burned and there are other burns and melted plastic parts. The interior is a mess. John is a certified auto mechanic and had spent many hours restoring it. John and I eventually had the car towed away to a junk yard as a heartbreaking loss.

Adam Trombly has had a total of 54 attempts on his life. One of the latest occurred early in 2006. Also, a suspicious incident occurred July 4, the day after my Corsica was firebombed, when Trombly was visited at his Aspen, Colorado (?) home by a man of Middle Eastern origin who knocked on his door and earnestly tried to give him ten free cases of meat. Having been previously forewarned, Trombly refused fearing the meat had been poisoned. The man became upset and even tried to add a free freezer. He then gave up and told Trombly he had to get back to Las Vegas. A few minutes later, Trombly took a walk and found the man sitting on a sidewalk curb talking on his cell phone.

Trombly's report hints that an energy invention suppression hit squad might be based in Las Vegas.

One of my energy inventor friends, who himself has been a target of energy invention suppression, happened to visit me a few weeks later. He has emailed "What I witnessed at Gary's house was no teenage prank. It was obviously intended to totally destroy a car, not just scratch the paint or leave a scar. With several other cars parked at the same house, Gary's was obviously targeted, not just the easiest to reach."

Three weeks before my car's firebombing, I had published on the Internet the third version of this compilation of energy invention suppression cases which can be read in www.byronwine.com (do Find for Vesperman). Other sites can be found by entering in the dogpile.com search engine Vesperman suppression.

So it may be that the energy invention suppression terrorists, possibly based here in Las Vegas, had retaliated by firebombing my car. I don't feel intimidated at all. In fact I am mad and more determined than ever to help end energy invention suppression.

Adam Trombly (Interview): The Truth about Zero Point Technology

(Originally published in Spirit of Ma'at: "Free Energy & Alternative Energy - Part I" — Vol 2 February 2002. For the print version see http://www.spiritofmaat.com/archive/feb2/prns/trombly.htm.)

The Truth About ZP Technology: A Wake-Up Call to the American People – An interview with Adam Trombly by Celeste Adams

Adam Trombly is one of the top scientists in the world in the development and creation of zero point energy technology. Devices that he built are working today in other parts of the world. And yet, instead of using zero point energy, Adam Trombly's own house in Maui is being fitted with a bank of expensive solar panels.

Why can't Trombly use his own expertise to fuel his own home? Trombly has spent most of his professional life under one gag order or another. But he decided, he told us, "that if I was going to give an interview for this particular publication, I wasn't going to pull any punches."

If much of this seems overly negative, keep reading. Trombly wants to wake us up, and to shine a light upon things that have been kept dark. But his grounding is deeply spiritual. It's just that the Divine forces that seek to assist us cannot do so unless we call upon them. "Now, in this moment," he tells us, "we must come out and ask for help. When we can ask for help, we get it."

Adam Trombly's revelations will shock you to the depths. But it is his hope, and ours, that it will help you to awaken, or to assist you in your task of awakening others.

Trombly's ultimate vision is the "redreaming of the American Dream."

Adams: How did you become interested in free energy?

Trombly: I was raised as a scientist and I have spoken the language of science all of my life. My mother was a blood specialist, my father was a biochemist, and my sister was at one time a biophysicist.

When my father had just gotten his Ph.D. in biochemistry from Purdue University — I was a young child — he was enlisted as a biochemist, by a fellow Purdue alumnus named Frank Olsen, into a U.S. Air Force/CIA joint project. He was stationed at the biological warfare laboratory in Fort Detrick, Maryland. This was in 1952 during the Korean Conflict. He had been a highly decorated U.S. Army Air Corp officer in World War II, but the government felt that he had a skill of strategic importance to the national security.

At Fort Detrick, he and Olsen, along with a couple of other scientists, were working on a very compartmentalized project. Since he died when I was in the eighth year of this body, I knew very, very little about what this project involved. On the seventh anniversary of his death (4/3/1967) I was in my mother's attic, putting out mousetraps, when I discovered a couple of boxes that contained journals my father had kept during his time at Detrick. You weren't supposed to keep journals, but he did.

One of the things he wrote about in his journals was his exposure to alien technology that totally defied what were considered, at that time and even still to this day, the laws of physics.

He wrote a letter to Dr. Quackenbush, who was on his dissertation board at Purdue, saying that what he had seen challenged even his "most vivid imagination." This was right after he got there.

After he had been there about a year, the notes he wrote got really interesting. He specifically described various technologies which he stated plainly were of "alien origin." He described not only flying disk-shaped craft and their related energy and propulsion systems, but Extraterrestrial Biological Entities. His work was actually concerned with them.

On November 19, 1953, my father (along with Dr. Frank Olson and a couple of other colleagues) was taken by Dr. Sidney Gottlieb to a summer camp near Baltimore. While there, he and his colleagues were involuntarily given large doses of LSD in their cocktails; doses on the order of 10,000 to 15,000 micrograms. Olsen knew about the experiment, and out of concern for my father told him, "Harvey you have been given a psychoactive drug and you are beginning to feel its effects. Don't worry."

Olsen had also taken a large dose of acid, and later freaked out because he said he had, "blown the experiment." It was supposed to be a double-blind experiment for all of the participants other than Olsen. He was supposed to keep silent.

Frank Olsen continued to feel unsettled, and was rushed by CIA personnel to New York for psychiatric examination. Something terrible happened instead. Frank was bludgeoned in the head and then thrown from his hotel room window. He was murdered. This, at least, was the conclusion of forensic pathologists hired by Frank's son Eric in 1994.

My father filed an internal protest demanding an investigation of his friend's and colleague's death, and that was what ultimately triggered the events that killed him.

In January of 1954, under the illusion that he was being immunized from a new retroviral biological warfare agent, he was injected instead with a live virus that he had discovered during his research. He became extremely ill. In his notes, he indicated that he immediately knew. "They killed Frank," he said, "and now they have killed me. The difference is that I will die slowly, very slowly."

He died in 1960, from a form of lymphoma as eleven government labs did morphological workups of his cells.

When I discovered that his death had not been an accident of nature, I was heartbroken. I despaired of life. I sat with a knife a quarter inch into my chest, with blood already trickling down, begging whoever was present at Infinity to reveal the truth of existence.

And in the next moment, I suddenly had no doubt of God or, if you prefer, the Buddha Nature, and I saw things with great clarity.

Adams: Do you believe that we're in denial about the involvement of aliens in the affairs of this planet?

Trombly: The American public has been lied to for so long, they wouldn't be able to recognize the truth if Jesus told them personally.

It's very difficult for the American public to know what is going on. In many ways, we are a nation in denial, and all too often a nation of alcoholics and drug addicts. We are in incredible mass denial.

People see what are referred to as flying saucers and UFOs. Sometimes they are not saucers but triangles. Sometimes they're small, and sometimes they're huge and look like buildings.

It doesn't matter how many people in remote places or in cities see them, or photograph or videotape them. The perceptions are simply shut out.

There are amazing mind-control projects going on. People literally cannot maintain their attention span. More than once I have stood and watched crafts 100 or 200 feet over my head and had people say things like, "Well that's not an airplane," or "Oh, my God, are we actually seeing this?" "Is that real?"

But by the next day, the whole chemistry of denial has set in and those same people say, "Wow, that was a strange airplane, it was going really slow, or really fast, and how did it make that right turn?"

This is what got me started in free energy technology — though I hate the term free energy, because it's anything but free. Many have paid dearly for its advent. I don't even know what term I like at this point. I use the term Zero Point Fluctuation Technology — ZP Technology.

I used to have a company called Zero Point Technology. As soon as you put something like that on your shingle, you discover just how unacceptable this concept is to those whose growth stopped so long ago.

People are being bombarded with subliminal messages that tell them that aliens don't exist. Even The "X-Files," which is a joke (thank God they're canceling it), was originally intended, by Chris Carter, to be something more than just random amusement. It was intended to be groundbreaking. But there's government interference. And this is a huge subject. People don't understand that the "other U.S. government" has had contact for decades with cultures that aren't from this planet.

We're like the aboriginal people of New Zealand, or Papua, New Guinea, or any other remote tribe. When they see an airplane, they think that it is a God — or they at least, they used to. Of course, now they think that it's just people who are more primitive than they are, but who have technology.

We are the same way with "alien" cultures. We are the same way with really clean and advanced electrical technologies that could begin to help us understand just how wonderful and abundant Being — simply being — is.

When I got involved in ZP in 1979, I was warned by Buckminster Fuller that if we were successful there'd be hell to pay. If we were actually successful, then it could develop into a real nightmare, because the humans we're dealing with are a species that has been kept in the dark. We've been treated like mushrooms (which are kept in the dark and fed a lot of feces -- there's no nice way of putting this).

The extremes to which these people are willing to go to make your life miserable are phenomenal. They go out of their way to torment those who challenge their utter mediocrity.

Then there are certain people who hang around in the so-called free energy field, who speak at conferences and who have never discovered, engineered, or invented anything in their entire lives that is worthy of note. What they have done is mediocre at best. I won't name them, but they just haven't produced. These are the people who say, "No one has ever bothered me."

These are the same people who — behind my back and behind the backs of those who have actually produced functional technologies — say, "Well I've never seen anything that he's produced."

Adams: Can you tell us more about this alien agenda?

Trombly: I know that there's an alien agenda because my father wrote this in his journals. He said he had discovered that the U.S. government had become involved in its implementation. He went further to say that this alien agenda, in his opinion, was contrary to the good of the human species and the planet.

He believed that a sector of the military/industrial complex was involved in a program, basically, to transform our atmosphere, which is benign to our species and other Earth species, into one that is greatly reduced in terms of its oxygen content.

So this is a force which doesn't have good intentions for us. It is a force that would gladly exterminate us. And yet human beings act as agents for this force. The "human" species is exterminating itself, by its own hands.

My father spoke of alien agendas in his most secret thoughts. This was not something he spoke of in public. He would never have given this interview, I'll tell you that much.

Adams: What species is this alien force?

Trombly: I can't say, but I can say that the species that are trying to harm us are a tiny minority of a vast host of alien species. My father knew of a couple. It wasn't just one, even back then. This sounds very far fetched — I know it sounds nuts. But I decided if I was going to give an interview for this particular publication, I wasn't going to pull any punches.

Adams: Many of the people who read this will share your belief system.

Trombly: Well, this is not about a belief system. I don't like belief systems! This is about reality! We are the ones who are collectively destroying the womb of the Earth in which our species gestates, in which we evolve.

There are real terrorists in Washington, and even, I dare say, in the White House. (See http://www.nogw.com/shadow.html.) And we are very rapidly approaching the time when that statement will be considered criminal. The incident we call 9-11 was a mockery. Now, every time someone dials 911 they'll think of the evil demon Osama bin Laden who in fact is someone we helped to create.

Alkhaida was largely financed by the U.S. government. We gave the Taliban 128 million dollars last year to suppress the growth of opium in Afghanistan. Where do you think that money came from? Where do you think it went?

Everyone thinks the 9-11 was caused by Osama bin Laden and his cronies. There's no doubt that some of his money comes from Saudi Arabia, but the fact is that the U.S. government is the primary source of funding for the Taliban. Why? Because Dick Cheney and his cohorts want to build an oil pipeline through Afghanistan.

Adams: What has happened to the free-energy technologies that you've produced?

Trombly: Every single technology that I have either invented or co-produced is no longer in my possession. There's one in Arizona that has supposedly become a national security issue.

A former colleague of mine once went off on his own with a design that he and I had come up with. He built a device that was very successful — and is now in a can, and he is a shell of his former self.

Forget about whatever technologies I have had a hand in reducing to practice. We have heard from very credible sources that these are nothing compared to the technologies already being produced by certain prime contractors right here in the United States.

Why is it a national security issue? Why is a generator that generates several times more output than input a security issue? Why is it that the American people cannot enjoy what their tax dollars are paying for? Why is it that we have a government that is willing to deny the American people access to the very technologies they themselves are secretly producing?

It's not a joke. Our government has produced technologies, with our tax dollars, that could immediately begin to reverse the damage done by the irresponsible use of fossil fuels, and they are not allowed to be used.

They continue to pollute this atmosphere, and they continue to reduce the amount of metabolically available oxygen. Who could possibly benefit from that? What species do you know of that is actually better off today than, say, fifty years ago?

What is it that we do when we burn these fuels? We make fire. What is fire? Fire is a rapid oxidation process that releases heat. The real destroyers of the equatorial rain forest are forest fires, because of the incredibly poor husbandry. There's nothing good you can say about what's being done to this planet!

There are far too many people in the U.S. government and other national governments who are acting in a way that is completely moronic and self-destructive. It is not a human agenda! This is what I'm trying to get you to see. There is this whole other thing happening.

We are exploited by a corporate structure — by the "military-industrial complex" Dwight Eisenhower warned us against in his farewell address to the nation. Eisenhower got the term "military-industrial complex" from Mussolini, who was describing Fascism. These are words you don't want to use in our society.

At Project Earth we get mail from all over the world, and the one word that keeps coming up since our last so-called presidential election — about that debacle, that tragedy — is the word "coup." From the perspective of the vast majority of the human species, it was a coup. They say this in India, Japan, South Korea, France, Holland, Spain — everywhere. In spite of the fact that we never posted an article on our website that said or even suggested that we had a coup, people write to us and say, "How come the American people don't realize that they just had a coup?"

Then, following on that coup, we have 9-11. Everybody is terrified, but people don't want to talk the way I'm talking now. They think it's self-destructive.

I tell you truly, it is our collective silence that is truly destructive.

The United States of America is a sacred idea. It is a sacred thought-form. What was America to the people who risked and frequently lost their lives to create it? It was the New Jerusalem. The spiritual foundation of the United States of America is an absolute necessity of our spiritual dimension. It was founded on the basis of the absolute need of the human spirit for freedom.

But freedom brings with it great responsibility and demands great intelligence.

We do not want to live in hell, but we are creating hell for ourselves. We are tormenting each other and ourselves. We're doing these things as if we have no choice. We are truly brainwashed.

The real ultimate cult that's going on in America is this one of jingoistic, flag-waving, unquestioning patriotism. We can get ourselves all hyped up on Zoloft, and that still doesn't change the fact that we as a nation have lost an incredible amount of prestige and trust because of what happened in 2000.

No matter how much money we put into the military budget, we will not be able to restore that trust in our own people or in the rest of the world until, through grace or the incarnation of the Divine Process, our democracy is resurrected from its present contrived state. It is a travesty.

When Dick Cheney refuses to turn over documents to investigators, he gives comfort to our enemies. Truly dangerous and deranged people in truly difficult countries like Pakistan cite the actions of our corrupt public officials as justification for their actions.

If we say to the world that we represent Freedom and Democracy, then by God we have an obligation to be Free and Democratic.

In the meantime, the world laughs, because perfectly capable intelligence officers in the United States are oppressed for the sake of short-term political agendas.

The Central Intelligence Agency attempted to warn the White House before September 11. The entire affair was handled with what can only be called incompetence. While three-letter agencies spent our tax dollars listening to my calls, true terrorists were going to flight. And in spite of over an 18-minute warning crash, a second full-size passenger jet went into the World Trade Center.

Even so, we are all supposed to fall into line and cheer.

Once, in 1986, I was introduced to a man in Toronto, Canada, who turned out to be a major Soviet technology spy. When he offered me a lot of money and a lot of benefits if I would turn over mechanical drawings for an electrical generating technology I had co-invented, I told that agent to go screw himself. I told him I was under a gag order, and that I would not violate that order.

He responded by saying, "What loyalty do you owe to your country? They have done nothing to help you or your work. If you cooperate with us we will appreciate you and take good care of you and your family. Three hundred million people will benefit from your technology. Who cares if a shaft is made in Leningrad or if assembly occurs near Moscow?"

Once again, I told him to go screw himself, to go back to the totalitarian hell that he came from — and then I got the hell out of his office.

In September of 1986, I turned this man in to the FBI — and as a consequence, I ended up under investigation myself!

In February of 1987, the counter-intelligence unit of the FBI contacted me. During my second so-called "interview," one of the special agents who interviewed me was Robert Hanson, now known as a famous spy for the former Soviet Union.

Hanson interviewed me about whether or not I was a spy. But he knew I wasn't a spy, because he was!

It's not just the U.S. government that's suppressing all this stuff, it's the whole theater of this species. The "human" species has rarely demonstrated qualities that say that it should be maintained or can be sustained.

This species has never acted in a way that is consistently to its own benefit. For thousands of years, this species has acted in a manner that can only be described as both sadistic and masochistic, and on a planetary scale. It has not acted intelligently.

At the same time, there is no decision to change, because the vast majority of the human species don't even realize that we have a choice to do that. They don't realize that we have the choice live intelligently. They don't even know or what that would entail.

My protests to the "powers above" are consistently related to this central fact: "I know there's a choice, you know there's a choice, but the general population on this planet has no clue that there's a choice. We can choose to live in a completely abundant and pollution-free environment. We can make that choice and have more abundance, and not less abundance. We can stop spending money for fuel. The capital expenditure for fuel could be completely eliminated. That would free up trillions of dollars annually, globally, from the world budget, from the planetary budget."

If you want to know why I got involved in this technology, it's because we have a way to generate almost boundless levels of electrical power without any pollution or fuel, without even the need for solar panels or wind power.

It's ridiculous that I am installing solar panels in my home, when I have spent the last 23 years of my life in the field of ZP Fluctuation Technology research and development and have one more than one occasion successfully demonstrated it along with colleagues who have also learned the same hard lessons that I have.

Adams: Can we still restore this planet?

Trombly: We can if we act with great clarity and great speed. No obstacle could stand in our path.

We could even reclaim the Sahara Desert. It didn't used to be a desert. It was destroyed by people who cut down the forest and overgrazed the grasslands that were once there. Now the same thing is happening in Brazil, Indonesia, China and South East Asia.

These forests and grasslands are like your skin. What does the skin do? It keeps us from becoming dehydrated. When a person gets third-degree burns, one of the leading causes of death is dehydration. The same thing is true of the forests and grasslands.

It's about maintaining that tissue and understanding that it is very vulnerable. These membranes are being taken away.

We can also reclaim the desert that is forming in the northeastern corner of Brazil, where there was rainforest a hundred years ago. The Brazilian desert exists because the Brazilian people won't stop cutting down their own trees. I say this very bluntly. If the Brazilian people want to demonstrate that they have some intelligence, then they'll stop cutting down the rainforest, which is the equatorial life support of our planet.

If the United Nations and if the American government want to demonstrate their intelligence, then they will suggest that we should give credits to these countries for their oxygen production.

We can reclaim the deserts by these new technologies, by taking the water out of the oceans and using it on the desert.

Where you run into the logjam, over and over with all these issues, is the question of energy.

How can we heal the ozone layer? It's going to take a tremendous amount of energy to do that. We have to replenish the oxygen that's not getting into the stratosphere.

One of the fundamental points that I try to make is about chlorine. It is a molecular demon once it gets into the ozone layer. One chlorine ion can interfere with the production of 100,000 molecules of ozone. So we have to eliminate as much free chlorine and bromine as possible.

But even if we entirely eliminated chlorine and bromine production, that would still not be enough to heal the stratospheric ozone layer.

Another significant cause of ozone depletion, one that is often overlooked, is the reduction in the amount of oxygen that should be transported into the stratosphere over the equatorial rainforests. Project Earth has been trying to educate people to this fact since the mid-eighties. The oxygen source has literally been cut off by deforestation. But we can heal that by reintroducing a tremendous amount of oxygen up there, and replanting the forest down here, on Earth.

It will take energy. Lots of it.

Adams: Can you describe how your life has been endangered because of your perspectives on free energy?

Trombly: If I had described my life to you since 1980, it would be a long, long story, and it would sound like a bad spy novel.

I've had a number of attempts on my life through really serious poisonings. My wife has had to revive me and give me CPR.

So we've had a whole nightmare component to our life. But we don't live in a nightmare at all. It's quite the opposite.

However, I must say that it has been almost unimaginable at times.

Once, in 1988, I was visited by a couple of scientists at my home in Colorado. One of them was Bob Dratch, a man who has done a lot of work in creating microwave detection equipment, which is widely used by the Department of Defense.

Basically, I was standing in my office, which was a large room, 27 feet long, and Bob Dratch was shaking change in his pocket, to demonstrate that his very sensitive microwave detector could pick up the signal this jingling generated. The signal would appear on the meter and the printout.

I pointed the horn of the device at Dratch to measure the effect. And then, as I pointed the horn away, I kept my finger on the trigger and happened to point it out the window of my office. To our surprise, the alarm went off on the machine! The red light went on, and the meter peaked.

My office was being microwaved!

I walked into my back yard and found the place where the signals were being broadcast. It was right behind my house, in a little forest, right next to an engineering company that is well known for making satellite antennas.

I clipped the cable to the antenna that was broadcasting microwaves at my house, and I called the FCC in Denver. I said told them that this was illegal, and I wanted it stopped now. I said, "Stop microwaving me." I already had cancer.

Within three weeks, this engineering company was totally gone. I assume they themselves had something to do with the broadcast, or they wouldn't have left so suddenly.

So dozens of people had to relocate to Kansas, or where ever.

But why were they trying to kill this body? We are perplexed at times by the strange modus operandi of this group.

The world is not going around very well right now, because people aren't loving. When people love, they become geniuses. Intelligence isn't about thinking, it's about feeling. I don't care how many times the force of darkness, which resists love, has attacked you and made you feel separate.

I don't care how difficult anyone's life has been. I guarantee you, I can match it. But suffering is finite, it's limited, it's not eternal. You can transcend suffering through love.

The resurrection we are called to is our resurrection. Once Jesus stood in front of Lazarus' tomb, and commanded, "Lazarus, come out." And we are told that Lazarus came out.

That is similar to what is happening right now. Surrounding this planet, there is a gathering which is inviting the human species into a new dimension. They are saying, "Lazarus come out, come out of your subjective tomb and out of your corruption. Come out of your doubt of God and out of your doubt of Love. In the midst of Infinity and Eternity, We command you."

Now, in this moment, we must come out and ask for help. When we can ask for help, we get it.

People don't understand that you become realized by incarnating love. We live only as expressions of love, in eternity. The only thing that is eternal is Love. Love as the presence of consciousness is eternal and infinite.

Time and space are subsets of eternity and infinity. Space and time are subjective states, and they have nothing to do with limiting the ultimate reality of consciousness, not even a little bit. They have to do with the gnarled subjective states of the contracted world.

Scientists talk about the accelerating expansion of the universe, but it's not that, it's the unremitting *transformation* of the universe that's happening, the inescapable transformation of the universe.

You don't have a choice about it this time. It isn't the same as it was two thousand years ago. We are in the midst of the time of the resurrection. It involves you and me and everyone on this planet, I don't care who they are.

There will be miracles everywhere. The most powerful thing is love. The whole astrophysical community is now acknowledging this power, but they call it the "dark energy." They give it this Darth Vader quality, because they don't know how to relate to the Light. It is the contraction of form and the denial of the Infinite Divine that causes the appearance of darkness.

Adams: How long has there been a conspiracy to prevent the development of free energy?

Well, if you are referring to the technological side of things, I guess you could say it started with Nikola Tesla. (Although the crucifixion was really an attempt to stop Free energy as well.)

Nikola Tesla was given the vision of infinite electrical power, without fuel, in the 1880s. He demonstrated it in 1886 and 1889, and then throughout the 1890s. He tried to give this gift, but the fossil fuel boys decided he couldn't give it. The fossil fuel boys decided that maybe they could make use of him, so they didn't kill him right away. They killed Tesla in 1943.

One of the detectives approached me in 1981, at a conference. This man told me that Tesla had been murdered. So I guess you could say that it all began right there. When I was a kid in school, nobody knew about Tesla. Tesla was the father of alternating current electricity. Tesla said he was inspired by aliens, beings from other dimensions. He was anathematized because he refused to kowtow; he refused to attend the same temple that the others worshipped in.

Adams: How can we make free energy available to the planet?

Trombly: There is no such thing as free energy without enlightenment and liberation. The technologies point to free energy. We are the technology. We are the free energy.

Great yogis like Sri Babaji demonstrate this. Yogananda talked about him. He was the physical demonstration of free energy. He was the physical demonstration of what the Tibetans called the Rainbow Body. He was transparent and transfigured in God realization, the realization of the Buddha Nature.

There are alien cultures and cultures in other universes who happen to be attentive to the events on this planet because this is one of the last archetypal moments. This will not continue anymore. This entire kind of universe is obsolete and will not occur again, because it would be masochism and sadism to allow it to be perpetuated.

There's a transformation that is occurring. It is about the liberation of all the energy that has been bound up in all of these worlds that are subject to corruption. That is the real physics. This is what is really important.

In the meantime, by understanding that this is true, we can tap into a field that we call Zero Point Vacuum Fluctuation or the quantum ether, and we can generate electrical power. Electrical power exists in complete abundance, without any capital cost for fuel.

Solar technology is so very expensive. We have 108 solar panels in our two facilities on Maui and it takes up a great deal of space. I would love to have ZP Technology here, but the fact of the matter is, if I had that working right now, this place would become a target.

The other side of this story is always the same thing. Just when Light appears on this planet, the subjective forces of darkness manifest with great tenacity. This government was overthrown and nobody knows anything about it. People are silent about it.

On the cover of *Newsweek,* on September 11, was an article about the secret vote that made Bush president. The article was about a conspiracy in the Supreme Court. *Newsweek* at that time was willing to challenge the Supreme Court. The Executive Branch of the United States government was about to fall, because it was going to be exposed.

But then the planes hit the World Trade Center.

If Al Gore had been elected, I know the man well enough to know that we would have been in a different economy after four years. We would've begun to implement these technologies.

The United States government has, right now, the technology to eliminate the energy crisis. This consoling gesture that George Bush made the other day, about developing hydrogen fuel-cell technology, is just a carrot that he's dangling before the American people.

Now there are military people who have come forward and are talking about the presence of aliens and alien technology on this planet. They are even talking about the fact that we are making our own flying saucers. This Disclosure Project is extremely important for people to know about (see Secrets from the Stars elsewhere in this issue).

We could be having the greatest economic boom in the history of history. We could actually do that. The technology exists. As early as the 1970s, Henry Kissinger, George Bush, Richard Nixon — all kinds of these guys — knew about this physics. But the downside is that we are on the brink of oblivion.

Parents are paying all this money to educate their children into the lie of physics instead of the truth of physics. Meanwhile, they are taking Prozac. We have legalized the anesthetization of our species. Depression is appropriate.

Adams: What is the purpose of your organization, Project Earth.

Trombly: The original foundation of Project Earth was to reveal to the human species the actual condition of our planet. We're not being told the truth about it. For the most part, the scientific community doesn't know the truth and has been so disempowered by their so-called education that they've lost vision.

Vision is the only thing that will save us. You have to be able to see where you're going.

The agreement that I made with the Divine is one that Bucky and I talked about. We would never just illuminate the problem, we would always offer a solution. If we talked about an energy crisis, we would talk about only it in the context of the fact that there is no energy crisis.

Electrical power is already abundantly available, pollution free. We like electricity. We can power our cars and flying saucers with infinite electrical power. We could have so much fun that living on earth wouldn't be a drag, but would be really great.

Your eyes would be so open that you would walk out the door and you wouldn't see the smog in Los Angeles, but you'd see the clear, sacred air.

Project Earth is not just about communicating the problems. It's about the transformation of humanity.

(End of interview transcript)

Adam Trombly, Director of Project Earth, is an internationally acknowledged expert in the fields of physics, atmospheric dynamics, geophysics, rotating and resonating electromagnetic systems, and environmental global modeling.

Taking the advice of his friend and mentor R. Buckminster Fuller, Adam has maintained a "synergistic, global view" within a multi-disciplinary scientific background. From this perspective, Adam offers unique insights into the changes humankind has effected on our environment, and the adjustments our future requires of us.

For further information about Project Earth, please visit ProjectEarth.com.

Trombly and Celeste Adams spoke on January 21, 2002.

Adam Trombly (Speech): Climate Change Factors, Ozone Layer Crisis, and Zero Point Energy Technologies

(Transcript, slightly edited from http://www.repp.org/discussion/green-power/200205/msg00011.html, of Adam Trombly's speech to the 1988 International Tesla Society Symposium, Colorado Springs, Colorado. Trombly provides additional details regarding Tesla's murder by painful poisoning, likely by the U.S. Government. It is reprinted in its entirety because I believe Trombly's message concerning energy in 2007 is even more urgent and troubling. Gary Vesperman)

As this is the last speech of the conference here, I'm going to give an overview of the development of zero point theory and I'm going to try and take into account all of you have been very patient...

The basic principle which we are obviously here to address, was originally elaborated by Nikola Tesla. The sense that Nikola Tesla conveyed of existence was, if not unique, then certainly it was profoundly inspired, not so much by initial analysis but by initial vision.

We have become a rather left brain biased society, an analytically biased society. As a result of this analytical bias we tend to refute or deny the validity of intuitive jumps or intuitive leaps and insight.

Tesla was an extraordinarily prolific inventor obviously, but in addition to being a prolific inventor, he explored very thoroughly, for his time, the dimension of the psyche. And I think that perhaps too often we tend to forget that he himself claimed that the source of his inspiration was not conventional.

He saw what he built, and then he described it to a draftsman, and built it. The draftsman was his interface with substance. To consider that when he was riding in his carriage or his Pierce Arrow here in Colorado Springs, not too far from where we are right now, he would often see devices in their totality, spontaneously.... is quite remarkable. (I myself have seen descriptions with drawings of some of Tesla's complicated machines. Genuinely amazing! Gary Vesperman)

When you see something in its totality, it tends to have a different meaning than if you tried to put the pieces of the universe back together to arrive at a conclusion. Tesla insisted that he rested in the conclusion in his own psyche. I think this is very important. Tesla was not an analytical apologist; he was not somebody who made gestures to the scientific community to make himself necessarily acceptable in his time. What was acceptable was that he produced. The means by which he produced were often unacceptable, especially in the last couple of decades.

Therefore, we heard a lot about Thomas Edison, and we heard a lot in our education about just about everybody else except Nikola Tesla. The reason I'm sure this Society exists is this left a vacuum, a huge vacuum that is not merely filled by the acknowledgment of Nikola Tesla, but by the acknowledgment of the function of a human being, the function of a being not being polarized to the left hemisphere, but balanced to the two hemispheres of the brain, in other words vision coupled with analysis.

In the development of our generator, which we originally called the "Acyclic Closed Magnetic Generator," vision was implicitly necessary to arrive at our conclusions. Basically we had to work from very little information. There were very few explorers in the field, and we had to begin to consider that perhaps the way we considered reality actually is fundamentally incorrect, that fundamental cornerstones such as the law of induction, for example, that particular cornerstone was not necessarily as we believed it to be.

What stimulated me, and I've said this before, since 1980, was the recognition that certain astrophysical phenomena express energies in excess of what the apparent input is. This is a very common thing in astrophysics, whether you're talking about quasi-stellar objects, or whether you're talking about the planet Jupiter.

When we first found out that the planet Jupiter was developing a looped current between itself and the moon Io, Jupiter was called, in a paper published by a Goddard scientist at NASA, a "Homopolar generator."

They tried to rationalize that the relative motion between the moon Io and Jupiter was actually responsible for the current that we could measure by virtue of its magnetic flux tube as tested by satellite probe. But when you went through some very simple calculations, you found that was not true.

So we decided that we would look into the matter of "Homopolar" generation itself – the history, who came up with it, as Bruce DePalma and others have pointed out. Even though Michael Faraday did an experiment on December 26th, 1831, in which he co-rotated a magnet with a copper disk and measured a current output. Even though he had done that experiment, his own law of induction tended to ignore that fact.

A professor with the Royal Society in London, a professor of science history, told me that the original Faraday cage was designed not to keep electromagnetic noise out, but to keep Michael in. You see he played with a substance we call mercury, and in those days there was very little appreciation for the toxicity of mercury. And so Faraday apparently suffered from a form of dementia, which we've heard very little about because it's one of the cornerstones of the building we have been living in, in science.

We found out after we found Faraday's diary, after we found the citations of the experiments that he had done, that there was a gentleman by the name of Bruce DePalma in Santa Barbara, California, who had suggested that on the basis of the co-rotation of a magnet and a conductor, which we were at that time contemplating ourselves, it might be possible to generate more energy out from the generator than input in.

I must say that my initial response to that was probably not as skeptical as some people might be when they heard such a thing, because in the fields of astronomy and astrophysics it is not uncommon, not uncommon at all to find an object that is obviously exceeding what we "know" to be its thermonuclear, or any other form, it's exceeding the output that it could possibly have by thermonuclear means, by fusion, by fission, by anything we normally consider.

And so, because we had seen that already in space there was this planet Jupiter clearly being a demonstration of what we initially considered to be an anomaly. Clearly putting out three times as much energy as it could possibly be receiving from the sun. We decided to reduce to practice a form of generator with the intention of practical commercial use, and through various good fortunes we arrived at funding.

We actually, for this field in those days, got substantial funding. And as a result of that work, we applied for a patent in 1980 which was, as many of you know, denied by the U.S. Patent Office as being implausible to the extreme. The statement was to the effect that, "This device could not even generate electricity." It wasn't that it couldn't generate electricity in excess of input, it was that the machine couldn't generate electricity at all. The patent officer himself was, as many of us, as all of us basically were unfamiliar, he being totally unfamiliar, with the fact that you could co-rotate a magnet with a copper disc, even though we had provided him with a copy of a page from Faraday's diary. He actually suggested that the diary notes might have been something created expo factos.

My initial naiveté in entering this field was rapidly destroyed.

We felt that if we could produce a practical, commercial, viable unit, then the world would be very excited indeed. And what we discovered instead was we were dealing with a profound level of inertia; inertia in a frame of reference we didn't normally consider.

Economic inertia, intellectual stasis and dogma. Certainly the explorers in this field, over time, whether it's myself, or Bruce DePalma, or Tewari or going back to Moray, Tesla, Hubble. These people all discovered this inertia. It is an astonishing thing when you first encounter it. It is irrational. It says that no, indeed the Earth is the center and everything revolves around it. And the moons around Jupiter couldn't possibly be doing that what you say.

Galileo wasn't vindicated by the Catholic Church until 1984. If we took that many centuries to acknowledge zero point vacuum fluctuation-based technologies, we will all be dead. And that's the sobering realization that I have come to over the last five years.

Buckminster Fuller was a huge influence in my life. I met him when I was sixteen years old and largely because of his influence I wasn't permanently lost in space; lost in the theoretical level of things. And therefore, when I began to encounter this resistance he said something that was very important to me. He said that every new idea, every new technology, every major breakthrough, has an inevitable period of gestation. He said you must learn to be patient. He had experienced profound resistance, as you may know, to various ideas that he had in the thirties.

I think that what we are really seeing is not the resistance or inertia imposed upon this technology, but instead a resistance to a fundamental shift in perception about the Universe itself.

We have tended to describe ourselves in discrete terms, as encapsulated beings, with rather defined boundary layers, both temporally and spatially.

We're born and we die. The boundaries of our body are the boundaries of our being. Inspiration has a difficult time entering into a closed bottle. Where would it come from? Where would it appear?

How could Nikola Tesla say he got ideas from space? He was considered a very eccentric and crazy man as a result of his statements. People point out that he always had all these napkins piled up next to his plate. But by the end of his life, people had forgotten that his vision is what is powering these lights. And if we had continued with his vision, we wouldn't have a fossil fuel economy today. And J.P. Morgan and Rockefeller and a number of other individuals would not have amassed extraordinary fortunes on the basis of that fossil fuel economy.

I think this is extremely important for us to understand because when Nikola Tesla's vision was denied, a part of our own vision was denied. Just as when Galileo's vision was denied. The fact of the matter is that as we sit or stand here, a field of energy pervades us. This even relatively conventional physicists like John Archibald Wheeler stated in a 1962 article in the Review of Modern Physics. "Energy has a mass equivalence of ten to the ninety-fourth power grams per centimeter." You just need to look in the literature. That ninety-fourth power grams per cubic centimeter represents a rather coherent state. It represents something that we could very easily call a continuum.

But because of the taboo against the idea that you might perhaps be able to get water from the well of space, or what people call "perpetual motion", there has not been a sense of any kind of practical application.

Once in a seminar, well over a decade ago, I asked a question I found was extraordinarily taboo, and I said, "Why can't we tap into this field?" It had been established in the literature in Europe by Philip Sipolan (sp?) since 1951 and 1952, that not only did the fluctuation field exist, a fluctuation field of extraordinary energy equivalence. And that the vacuum field was bias able; that it was polarizable.

The polarizablity of a vacuum, fluctuation background, I believe is the essential issue, and a very simple issue indeed that we need to really consider.

David Deutch in 1982 explored briefly in a book called "General Relativity," on Einstein's centenary, which was edited by Hawking, considered very briefly the fact that not only is the vacuum polarizable in terms of density, but that an ideal theoretical situation density polarization could asymmetrically approach infinite density and asymmetrically approach negative energy density. That means that within the vacuum fluctuation itself, stress can be created. That means that the vortical dynamic that Tewari speaks of is really not that difficult to imagine, because you have fluctuation density that wishes to remain isotropic, or uniformly distributed, disrupted, polarized, in a curved manifold, and that vacuum density once polarized wants to relax from that stress back into a more isotropic state.

Anybody who studies vortical physics, fluid dynamics, plasma dynamics knows that there is no greater stress than that by which we invoke a vortical momentum. And therefore it is not hard to imagine, if we simply consider the fact that we are dealing with a medium of this extraordinary density. It is not hard to imagine or even begin to feel that just by simply biasing this field in a rotating cylinder or perhaps in an oscillating circuit, by biasing this field correctly, we can precipitate vortical momentum.

Now we may only precipitate a quasi-electron. In the vacuum fluctuation of space, their production is occurring all the time. In a bias environment however, where an electrical potential exists, that quasi-electron, instead of annihilating with its anti-particle, might indeed be distracted along the potential and find its way into what we refer to very blithely as manifestation.

It doesn't necessarily take giga-electron-volts for this to occur. And that's why Tewari, DePalma, myself and others speak of the generation of power from space.

We need to very simply and seriously consider that it's already in the literature. It isn't just in the literature of the fringe; It's in the literature now even of Physical Review since 1975. Review of Modern Physics, since 1962. And in the European literature since the 1950's. It's a remarkable thing that because of the bias against so-called "perpetual motion", or so-called, "free energy", that nobody seems to want to extrapolate what is implicitly obvious.

The atom itself can then be seen as a dynamic modification of field space. Only a dynamic modification of field space, with no quality of stasis what so ever.

Harold Putoff, in his May 15th, 1987 article in Physical Review, pointed out that in order for the hydrogen atom in its ground state not to collapse, it had to be absorbing energy from the fluctuation background. In this moment. This is not something that happened at T equals zero – before the Big Bang.

This is something happening at this moment, real time present context, now with every atom and molecule that we see configured before us. It is happening right now.

It is wonderful to have Dr. Puthoff describe this energy in terms of the Bohr atom. It is implicit that the electron orbit dissipates energy. If we consider that to be a resonant shell with no locatable density bias, then it still pertains because the atom itself, even in its ground state, resonates in space.

We have a picture, that we got when we were young, that says a thing is solid, even though particle physicists are telling us that nothing is solid, and while that's all very fascinating on Nova television, we still have a picture that persists. Can an atom, existing in certain states of polarization and stress, perhaps become a conduit drawing upon the energy of space? A transducer in a certain light.

Obviously it must be, or else it couldn't exist. The electron itself must be spontaneously appearing out of the background field. If it was not spontaneously persisting then we have to invoke the somewhat Neanderthal concept that everything had to start at a certain moment. And because we have embraced this new cosmology of the Big Bang in the last couple of decades, we have some real problems.

This is not the best forum to go into this in great detail, but I will say this - the Universe is clumpy. That's a term that is used frequently in astrophysics to describe the fact that mass is not uniformly or isotropically distributed. It is simply not. On a large-scale basis with models that have assimilated data from observatories from all over the world, especially over the last few years, we have seen that the Universe we observe is indeed clumpy. It is in fact concentrated in a way that cannot be the artifact of a Big Bang.

Now that's a bold statement. Alfven (Swiss Nobel Laureate), famous for Alfven waves, has come up with an extraordinarily beautiful description of the plasma dynamics of space. And so far, interesting to note, although he was considered to be a complete heretic when he came out with his theory, every single observation we have made from space with satellite probes, has confirmed his predictions. I think it very important that everybody here who is interested in the reality in which we adhere, become familiar with either the esoteric or the exoteric level of Alfven's work. It's just beginning to appear in the literature. I think Discover magazine had a rather prosaic presentation of it, but it was also quite good. (June '88; the "Big Bang Never Happened.")

If there was not a Big Bang, where things conveniently began with a single event, then we need to begin to consider the fact that something that has a gram equivalence of about a gram per cubic centimeter, which is our body, must be a rather insignificant modification of a field that has a potential of ten to the ninety-fourth power/grams per cubic centimeter.

This impacts the way in which we live together; it impacts the way in which we live with the Earth itself.

I had not initially planned today to show some slides from the NASA program, but because this is a cap speech at the end of the day, I feel that it might be very useful to digress for a moment and observe the rather catastrophic impact that the very concept of discrete encapsulation has had upon human existence and the Earth itself.

And I would suggest to you, after considerable study of the subject, which is now becoming accepted in the lterature worldwide, that we cannot sustain the dynamic of human existence any longer unless we begin to transcend the arbitrary, subjective boundaries that we presume to be true. Whether these boundaries are about ourselves, or all phenomena of manifest existence, until we begin to move beyond this anal-retentive state, in which everything must be particularized. Everything being particularized, leaves Humpty Dumpty.

We will never be able to re-assemble existence.

As Fuller pointed out to me at an early age, "existence is already implicitly whole, we break it into parts only in our minds only."

It is already unified whether or not we have a unified field theory or not. And as Einstein suggested at his last series of lectures at the Advanced Institute at Princeton, "perhaps we can only appreciate the unified field by entering a conscious relationship with it."

Again, this is something that would not have been at all contrary to what Nikola Tesla proposed, and yet some people would be embarrassed to say it.

I think we need to very succinctly consider that we cannot continue to burn fossil fuels on this planet, and that we really haven't found anything to do with our nuclear waste.

And that the appearance of bona-fide third party confirmation of the generation of energy from space is a significant event in history. It's not significant because it will make a few men popular, or unpopular. It's not significant because it will somehow create a minor change in our concept of being. It's significant because it represents a dramatic shift that we desperately need to embrace.

Right now we are sitting at the edge of an unprecedented human catastrophe on this planet. A friend of mine, Sayed Sayed (sp?), at Texas A&M who has for twenty years been a climatologist, in an elegant experiment recently carried out in Antarctica, has shown clearly that if we lose between 6% and 7% more of the remaining stratospheric ozone the phytoplankton in the oceans will die.

The phytoplankton in our oceans contribute 50% of the oxygen that we enjoy on this planet. It is extremely important to point out that prior to the appearance of photosynthesizing biomass; oxygen was a trace gas which basically appeared through the natural transitions of H_2O.

We simply cannot afford to lose any more oxygen than we already have. At this moment, literally hundreds of millions of internal combustion engines are running. A six-cylinder engine, of normal displacement, consumes eight hundred thousand (800,000) cubic centimeters of oxygen per hour. This transforms the breathable oxygen into combustion by-products, an entire spectrum of combustion products.

In the last twenty years, in Africa alone, we have destroyed 64% of the biomass ground cover. In the last twenty years! This is a United Nations Environmental Program figure, confirmed by satellite and manned space flight telemetry. (Remember that Trombly gave this speech in 1988. Perhaps these gloomy figures and reports are likely to be even worse now in 2007? Gary Vesperman)

Also, in the last twenty years we have consumed 29% of the photosynthesizing ground cover in Central and South America. In the last twenty years! You cannot consume oxygen at the same time you consume the factories that metabolize carbon dioxide and return oxygen to us, and expect to have a sustainable environment. Because as oxygen tensions decrease even a few percent in the troposphere, ozone tensions decrease disproportionately. This is because there is a column of oxygen and other gases that rises from the biosphere to the troposphere and then to the stratosphere. It is on the basis of the mixture of these gases, that we have ozone in the atmosphere.

I would suggest that we can not afford to wait to demand that serious money is applied to this research, Federal money. We need this to happen desperately and we need this to happen immediately. And for those of us who feel that we can be blasé, and wait and wait and wait until somehow this becomes acceptable, (the implementation of this new kind of technology) let me just say that if we think we can wait; we're sorely deluded.

You wonder why there is a drought in Ethiopia. You hear in Time magazine that the so-called scientists can't figure out why there is a drought. Well, Ethiopia at the beginning of the century was covered by 43% forest. Ethiopia today is covered by less than 4% forest. How is the hydraulic cycle supposed to maintain itself?

This at first, this entire consideration at first, seemed to be in rather left field of the consideration of energy generation. But, as I began to explore it further and further and lectured around the world, I began to discover that most of the human race has been entirely uninformed. Some people have suggested this is rather conspiratorial. The slides you are going to see in just a minute have been available, some of them, for several years. We finally got a few of them on CNN December 25th (1987?)

I think when you see them you're going to realize why they are so significant. And as always I would like to thank Richard Underwood of NASA, now retired, for providing these images. They are in the public domain, but anyone who has tried to get photographic data from the NASA space flight program, especially during the Reagan Administration, will find that it is a very difficult thing to do. As a matter of fact, most of the infrared photography is now stored at AMES, and you can't get into the building. Even though this material is not classified, the building itself is off limits.

I would like to have the lights dimmed, and I would like to show these slides and then we can go on from there. We can discuss in more detail about this and other things.

This is the way clouds are supposed to look over the rain forest. These are healthy clouds. These clouds are appearing over the Northern Congo area and this photograph was taken in the mid-seventies from Skylab. Cumulonimbus, stratocumulus, very beautiful cloud formations and an extraordinary density of water vapor as you can see.

Next slide. This is what the ground looks like after you get rid of the forest. This picture isn't from Africa, it's from Brazil; but literally millions of hectares worldwide look like this today. You can see that the watershed to this river, which is the Sao Paulo River, has been almost totally devastated. You can see that evaporation would occur rather rapidly instead of in a moderated sense through the membrane canopy of the forest.

The next slide shows the way clouds look after you do this. By the way, this is the same coordinate almost exactly, taken from the Space Shuttle in 1984, as the slides show big billowy beautiful clouds from Skylab ten years earlier. What you see beneath this cloudbank is now desert. So the cloud building is no longer healthy. Instead of that nice kind of veil of water vapor, you see an extraordinary, Los Angeles scale, optical density. That's dust.

Dust that has been lifted and aerosolized and now remains in chronic suspension over much of the African continent. The clouds are flat. The convective, humid currents that rose from the rain forest no longer carry water vapor in significant quantities.

(At the end of the above "Charles N. Pogue: 200+ MPG Carburetor" suppression case, this writer, Gary Vesperman, mentioned that he had taken an introduction to meteorology class given by University of Wisconsin-Madison climatology professor Dr. Reid Bryson. One memorable lesson was a study Bryson had conducted of why the Harappan Empire of ancient India had failed. Due to over-grazing by sheep and goats, the Harappan Empire's land had become barren. Each drop of rain is comprised of enough water vapor coalescing around a single dust particle that it becomes heavy enough to fall.

Bryson discovered that increasing dust in the air can reach a critical point where there are so many dust nuclei per unit volume that none of the drops of water can become heavy enough to fall as rain. A feedback cycle then starts up where lack of rain causes even more dust to be stirred up into the atmosphere. More dust causes even less rain to develop.

Bryson's suggested simple solution? Stop goats and sheep from over-grazing the land so as to allow the land to re-vegetate and keep down the dust. The feedback cycle then reverses itself – causing more and more rain to fall.

Currently the American southwestern states are enduring the worst drought in many decades. Are they about to suffer the same fate as the Harappan Empire?)

There was a great effort, a joint effort of the United Nations and several other countries to seed what clouds remain to see if the hydraulic cycle could be restored. Unfortunately somebody forgot to plant anything under the seeded clouds, so the desert is now growing. The Sahara desert is now growing six miles per year and is three thousand miles across. This is significant.

Next slide please. This is to give you an idea of the scale. We are not looking at the desert floor here. We are looking at a pall of dust that stretches as far as the eye can see, to the curvature of the Earth. Twenty-five maybe twenty-eight thousand square miles here. This area all used to be called the sub-Sahara and now is moving into the Sahara. Flat clouds, no rain.

The next slide will show you conclusively that when you see breaks in the pattern, you have a deeper understanding of the optical density. This density is equivalent to a critical day in Los Angeles. This again is chronic and has serious ramifications for us on this continent. Serious ramifications.

This has happened because somebody denied vision. This has happened because when in 1906 Nikola Tesla said that fossil fuels would one day create a corruption in the entire atmosphere of the Earth, he was called eccentric. Next slide please.

South of the aridification process, in Zaire we have fires. These fires are burning out of control. They have no planes to drop chemicals on the fires. They have no fire departments. They have no money. This is a small area, only a hundred by a hundred miles. You can see where the forest that was once there has already been stripped away, and the hydraulic cycle therefore undermined.

The next picture is Angola burning. The CIA did not win the war in Angola; fire did. 13,000,000 acres burned in 1985. When NASA scientists examined this photograph, they thought that this was some sort of strange cloud until they realized it was the combination of the plumes of smoke from the fires. Just consider the area involved, and consider the fact that this is now being visited on our country.

Alaska in the last three weeks has lost 750,000 acres to fire. The Secretary of the Interior, Hodel, said, “Let Nature take its course.” They saved part of Yellowstone that was close to Old Faithful, but decided that the rest of the wildlife habitat was expendable.

And this while we are spending hundreds of millions of dollars producing neutron bombs and other clean kill weapons, which can never be used and God forbid that they ever should be.

The next slide please. This is Junguoy (sp?) Bay on the coast of Madagascar, and it is not uncharacteristic of bays all over the world now. This is what happens after the deforestation and after the fires. This bay was over six hundred feet deep twenty years ago. Now you can walk across it during the dry season it is so filled with silt. This is happening now, today. It is not theoretical. We have to move now.

Next slide please. This beautiful lake was called Chad. Lake Chad was the size of Lake Erie. Lake Chad supported 1.8 million human beings in peripheral agriculture and fisheries. The next slide is Lake Chad in 1982. (In his movie, An Inconvenient Truth, I remember Al Gore showed possibly this very same pair of satellite photos of Lake Chad in central Africa. For an alarming update on Africa’s huge lakes, see http://news.yahoo.com/s/ap/20061209/ap_on_sc/warmer_world_african_lakes. Gary Vesperman)

It’s the hole that was left when the hydrological cycle was destroyed in Africa. This is not a cyclical drought, and it is not a drought that will be only visited on Africa. The water vapor distribution on this planet is being changed dramatically by the destruction of biomass.

The water vapor budget on this planet is being changed dramatically because we have failed to feel beyond our own little subjective event horizons. We tend to exist like psychic black holes. We take a lot and give too little.

A few years ago I pointed out at the fourth International conference on Atmospheric that the drought of 1986 and 1988 would occur. Now they have occurred. They are not going to cease because we don’t want them to occur. They are not going to cease until we realize that we need to mobilize every democracy on this planet, and hopefully this will someday soon include the Soviet Union, to implement this new class of technologies.

We can address these issues by planting forests and by using energy generated by these new technologies. Whether you call it an "N" machine or something else, I'm sure these technologies will continue to evolve.

By utilizing this energy which we can get directly from the "vacuum" of space, we can desalinate and re-irrigate. The Israelis if nothing else have shown us that you can resurrect a desert. We are going to need to resurrect a planet. We cannot posture ourselves and say that national security comes before the security of the human race. It is the security of the human race in total that is now threatened.

This is the last slide. I'm only going to show eleven slides today. I think they speak for themselves. This is a veil of dust that stretches out towards the horizon across the Atlantic Ocean, reaching from the Caribbean Sea, in the lower portion, all the way to the African coast. This is not a phenomenon that occurred in one year. This is a phenomenon that occurs every year – between eight and nine million square kilometers this year. (8-9,000,000 square miles)

This dust acts as condensation nuclei for water vapor causing precipitation in the south, over water, in Honduras, in Nicaragua, while the Midwest and Southeast are parched.

We are changing the way things work, and we haven't even begun to inspect the ramifications. It isn't just the "Greenhouse Effect"; it's a much more complex issue.

Only by stepping over the threshold into a more synergistic view, which is not just a kind of convenient term bandied about for the sake of the "New Age," but only by entering into a more synergistic view which acknowledges the inherent coherence of phenomena, can we begin to comprehend the fact that when you do something here it affects something over there. In quantum geometrodynamics, actually in a number of other studies, what we call action at a distance, in a coherent field, distance is not presumed.

I hope that this all has said something. Fuller's suggestion was that Project Earth should either determine whether there was a reason why we had to implement these technologies, or whether it was no big deal.

"Can we last longer? – I need to get my next grant from DuPont." To produce more chlorofluorocarbons? "Yes, it does seem that it might have that effect, but if I say that in the literature than I am defying my contract."

Scientific integrity, which used to be something that characterized science, is something that is sadly lacking in too much of the scientific community. Too many have become grant whores and parasitic on society, posturing themselves as authorities, condemned to the inertia of the past and past conceptualizations of reality.

Recently I was lecturing at John Hopkins, which is in itself sort of a miracle, about zero point physics and while we were considering zero point physics somebody said, "Well this is all well and good that Mister Tewari did this over in India, and that it's all well and good that you've done this in the United States. DePalma, it's all well and good to demonstrate it, but what about the United States Government?"

"I mean wouldn't the United States Government be doing something?" the child asked. A sixty-two year old child, a very nice man actually. And I said all you need to do is get a hold of the 1986 fiscal year "Request for Proposals" published by the Department of Defense.

Look on page 193 of that document, and you will see something very interesting. In AF section, which is Air Force section 86-77 subsection 6, you will see that a government which denies the reality of zero point technologies is requesting .... "further research into esoteric energies heretofore unknown including the zero point dynamic fluctuations of Space." ... for propulsion. But it doesn't exist you see...

But we want you to research it if you have a bona fide organization that happens to be a prime contractor with triple security clearance. This for propulsion for the Air Force when the entire human race is threatened. Now there is a certain kind of insanity somewhere implicit in that. It's in the literature; you can order a copy from Project Earth, or call the Pentagon. This is not a classified document. I won't get in trouble for saying anything. This is actually a program that is ongoing, right now, today, within the government enclave. Call Los Alamos and ask a question about it, and you might get a very long silence on the other end. Call Lawrence Livermore Laboratories and their Aberdeen Testing grounds. The same phenomenon will probably occur.

A significant amount of funding is going to make sure that this irrelevant, mythical phenomena is applied to weapons systems and weapons-carrying systems. Something is very wrong about that. I don't believe that anybody sitting in this room would say that it's in the best interest of our people, or any people of the world, for this kind of technology to be applied outside the realm of civilian application at such a time.

Six to seven percent further depletion in stratospheric ozone, and we are seeing depletion rate trends that indicate that this level of loss will occur very easily within the next two decades. Those of us who have really considered this, and as you consider it more and more I'm sure you'll realize that two decades pass very quickly, for all of us. It doesn't give us time, as I said before for subjectivity.

This field has survived, but not on the basis of being acceptable in the literature. Tewari has tried to publish. I know the IEEE (International Electrical and Electronic Engineers) is involved in this conference, but Tewari tried to publish in IEEE and was summarily rejected. Many of us have tried to publish and have been rejected. The reason Tewari even bothered to try to duplicate this "Acyclic Closed Magnetic Generator," after years of correspondence with DePalma, was because he was able to convince some mechanical engineers that it had some engineering method. You see they actually did material stress analysis.

We also analyzed. We used beryllium copper for a reason. It's just engineering. There are a lot of you in this room who are perfectly capable of doing it. There was nothing magical. We just operated on a different presumption. We said, "Maybe this experiment will work." And if it doesn't work, well then it's like 88% of the rest of them. If it does work, heh, then there is another level of confirmation.

Robert Kinchloe, Professor Emeritus of Stanford University, went to visit the, how can we call it, encumbered "Sunburst Machine". This machine was originally developed by DePalma, Richardson and Bernard at Sunburst Farms, Santa Barbara, California. Dr. Kinchloe just out of curiosity of his own mind, decided that he would just see if there was something about it that was unusual. He presented a paper on it, and I understand that it only got to Bruce through somebody else. But that's not unusual; my own attorney has directed my attention to an article I never knew existed. It's funny about that.

It's funny when representatives from our own Government look me straight in the eye and say, "Yes we know this is real, but we wonder why you would disclose it to foreign nations?"

I said, "I didn't disclose it to foreign nations. It was in an international publication in 1982, and I didn't even know about it."

I would suggest to you that it's time for us to not simply entertain a curiosity. I would suggest to you that it's time for us to enter a human process of inter-relationship, to try to attempt to reintegrate ourselves with one another and not in a floaty kind of "new age" sense necessarily at all. Just call ten people and ask them to each call ten people and tell them that we have an emergency on our hands. Demand that the people we are hiring represent us, supposedly, not the major corporations. We are hiring these people to represent US! Which one of you has the power to lobby in Washington?

We need to send a very clear message to Washington that states, "Gee, don't you think it's silly to be talking about Star Wars? We're only talking about Global Genocide." This without doing anything except for what we are doing right now. We don't have to drop a bomb or fight a war. Just continue exactly as we are now. All we have to do is remain in this collective state of inertia. And I don't personally believe we are going to do that. I don't believe that human beings are not going to rise to this occasion. I don't believe it for a second.

But, I do believe we need first to understand what we are confronted with. And then we need to understand that we can do something about it. We need to act, and we need to act like somebody who is being chased by a hot poker, or someone who cares.

Whichever your response is, Act!

Ten people calling ten people calling ten people, covers the country in a week. It's called "Exponential Networking." I didn't come up with the idea; Fuller did. Call ten people. Ask them to call ten people and find out what happens. It's the equivalence of an electron avalanche in human society. It works.

So, I wanted to try to give a wrap-up and I wanted to cite the fact that we wouldn't be here if it weren't for somebody's vision. Yes, their vision was applied. Yes, their vision, his vision, Nikola Tesla's vision was brought into life. Otherwise he would have been a mere mystic, wouldn't he?

Yes, we do have to sit down with our Macintoshes, or sit with our Hewlet Packard 41C calculators. We had a lot of money (for this field). A total between the two phases of the experiment of about $200,000. And now I'm finally happy to say it looks like it's going to be produced, or at least this one is going to be produced. It looks like DePalma is also moving into that modality.

We are certainly hoping that more people will come out of the woodworks and say, "Hey, well I've had this thing for the last thirty years. But I was told that if I brought it out into the public when I was working at Los Alamos twenty years ago, they would basically permit character assassination to ensue."

It's hard to believe in some ways, and I don't want to paint a black picture, but I think we have to see the end of times when the New York Times calls a National Center of Atmospheric Research scientist to ask, "How come everyone in the world says that the Reagen report on acid rain is a lie?" And the man answers, "You don't understand the kind of pressure we're under here. People's careers are in jeopardy." This when all our lives are at stake.

So I would like to open the floor to questions....

".....I raised a question in another seminar about the oxygen depletion, and the speaker told me that even if we were to kill all the forests at once it would take a very long time for the oxygen to dissipate out of the atmosphere....

We are talking about a change in the mixture of gases, okay? There are people who say that even if you combusted all the carbon on the Earth, biomass and post-biomass, the oil reserves, everything, there would still 75% of the oxygen in the atmosphere. Unfortunately, they fail to take certain things into account. For example:

Today we sit, and if you knew what we went through to get this acknowledged in the world press (And it would take me an hour to tell you), but we now have it publicly acknowledged by NASA that we have between a 2.3% and 6.6% depletion in world wide atmospheric ozone depending on latitude and time of year. This not taking into account the rather large depression over Antarctica.

When this level of ozone depletion occurs, the level of ultra-violet influx increases the probability of photosynthesis in the lower atmosphere. So, the O_2 is preferentially converted into H_2O_3 for example. This would normally only appear in great quantities after a lighting storm in the past.

We have a lot of H_2O_3 in the atmosphere. We have a lot of O_3 in the troposphere, which until very recently was being attributed to internal combustion. But O_3 was appearing in large quantities in rural areas where there was very little internal combustion, relatively speaking. It became an embarrassment when the Department of Agriculture had to admit that 2.6 billion dollars worth of crops were being destroyed per year by ozone alone.

So the photosynthetic reaction that is occurring as the result of increased ultra-violet influx must be taken into account if we are going to begin to understand what is going to be sustainable in terms of oxygen tensions. It is the mixture of gases that rise from the biosphere through the troposphere and into the stratosphere that determines the tension of ozone, O_3.

The Nimbus satellite, by the way which NASA has conveniently said is out of calibration even though it was in fine calibration last September, and in almost perfect agreement with the instrumentation on the ground in Antarctica. Which by the way at the center of the Antarctic hole, six miles up, we had 96% depletion levels last year (1987). The jumpsuits worn by some of my friends from the Center for Atmospheric Research, please understand there are a lot of good people there, people there I respect a lot, their nylon jumpsuits were actually degraded by ultra-violet exposure in just one flight. Several people had serious eye injuries.

Now anybody who is going to suggest that this type of influx is not going to effect the species of molecules that we have in the atmosphere, and the mixture of those gases, is denying an extremely important fact. So whereas I'm not suggesting we're all going to die of anoxia, what's going to happen when the phytoplankton in the oceans die? They are the basis of the entire oceanic food chain. If you are not familiar with them, they are the little critters that actually made all this possible. This conference would not be occurring today without their sponsorship.

I think we need to realize that we are sponsored by living things, and we need to support them so they can support us. Does that answer your question?

Yes, thanks.

It occurs to me that the resurrection of Nikola Tesla's vision and other people who have had the vision of the quantum ether, may yet be called on for a second offering. I think it's a good time to invest in this second offering of free energy. We did not invest the last time and now we are paying for it. I don't want to see anybody suffer. What will it be like in ten years, when already the American Cancer Society says that even with sunscreen protection ratings of 15 SPF, direct sun exposure should be limited to an hour?

I hope the Tesla Society will prosper, and move into a new age of manufacturing, implementation and further development. I want what has happened so far to be totally obsolete in ten years. One kilowatt in your pocket, why not?

There is absolutely no reason why not. You've got ten to the ninety-fourth power, grams per cubic centimeter energy equivalent field. It's not in a great big area, but it's a Lot of energy. If we can just scrape the surface, ever so slightly, we would never have to worry about it again.

That's what Nikola Tesla was scheduled to tell Franklin Delanor Roosevelt back in 1943. In 1943 he had proposed to FDR that perhaps we should look carefully at the fact that we can get all the energy we need from any space we happen to be in.

He didn't show up for his meeting with the president. He was found dead in his apartment, "Natural causes."

There is some suspicion that maybe his visionary paranoia of poisoning was not exactly paranoia, ... but premonition.

I have never mentioned this before, but when I spoke at the 1981 Conference at the University of Toronto, a detective, an older gentleman from New York, with a heavy New York accent, approached me afterwards and said that he was a detective at the time when Tesla had been found dead, and said he was involved with the investigation.

He said, for national security reasons, that nobody was to know that the coroner's report had indicated he had been poisoned.

I have never personally read the coroner's report, but the man was about the right age. He showed me a badge, and I had no reason to doubt this man who had come all the way up to Toronto from New York, just to tell somebody after all those years.

The coroner's report did say he had been poisoned. Now it turns out that the only medium to my knowledge it actually cites that Tesla had been poisoned is the Yugoslavian film on Nikola Tesla called, "The Secret of Nikola Tesla." So everybody can watch again the introduction, because they say it right at the beginning. And they also say perhaps that he was killed by the Nazis.

I did not really want to mention all this, but science cannot exist in an environment where science is not allowed to grow.

Any other questions? Well, you have all been a tremendously patient group. Thank you for your attention.

Thank you Adam.

Em-Tech Technologies: Advanced Solar Photo-Voltaic Crystal Lattice Cells

In 1989, during another flight of the Space Shuttle Atlantis, the U.S. military photographed a newly launched Soviet communications satellite in geo-synchronous orbit above Moscow. There were several things about the new Soviet satellite which were unusual. First, spectroscopic investigation of the signature of the satellite revealed the familiar tell-tale presence of nuclear material located in the aft section of the satellite. It was presumed (incorrectly, it later turned out) that this signature confirmed that the satellite was, indeed, powered by a small on-board thermo-nuclear reactor.

What did not make sense, though, was the fact that the power requirements, which American military analysts believed were needed to support the variety of functions being performed by the Soviet satellite, were believed to consume considerably more power than could possibly be produced by a nuclear reactor of the kind and size believed to be installed and operating on the satellite.

Further, the photographs revealed the presence of a peculiar kind of parabolic dish suspended from the nose of the satellite. It was shaped like the much larger satellite receiving dishes commonly used by television viewers in the West. The peculiar thing about this dish was that it was very small, less than three feet in diameter, and had a very flat parabolic surface. This meant that it did not focus the signals they presumed it received onto any boom-mounted collector or decoder device. No such device was mounted on or attached to the dish.

Finally, it appeared to be constructed of a material or combination of materials which was unknown at the time, but which appeared to be highly reflective, almost like a mirror. Interestingly enough, the dish was also apparently transparent to interstellar signals which originated behind it. For years it was believed that the strange parabolic device was a special kind of high-gain directional antenna. That assumption later proved to be totally false.

In fact, information recently supplied by the I.N. Frantsevich Institute for Problems of Materials Science (IPMS), Kiev, Ukraine, to support several of its patent applications confirms that the dish was constructed of the same crystalline lattice material which is used to construct the interior of exceptional energy storage devices, but built with some very special features. The purpose of the device was to convert sunlight and other ambient wavelengths of energy into ion flow or electrical current, in sufficient amounts to maintain the electronic and other operational functions of the satellite. In the West we refer to devices which act this way as photo-voltaic devices or solar cells. The device which looked like a high-gain antenna dish was certainly a solar cell, but it was much more than that.

The quantum physics and the new technologies which made it possible to produce the crystalline lattice structure of the energy storage devices also made it possible to produce a similar crystalline structure which was capable of simultaneously converting wavelengths of widely varying characteristics into ionic flow or electrical current. The strategy employed by this revolutionary new material worked across almost the entire spectrum of known wave lengths, from far out in the realm of extra-low frequency long wave lengths propagated by the original Big Bang all the way up through the visible light spectrum and beyond, into X-rays and ultra-high frequency, ultra-short wavelength wave forms associated with pulsars, quasars and quantum singularities.

The quantum mechanics which describe the characteristics of the crystalline lattice structure recognize two distinct features of wave/particle propagation which are nowhere integrated in the linear quantum mechanics or solar cell technologies of the West. First, the characteristic of crystals which differentiates them from all other known material substances is that they resonate (or oscillate, to be more precise) at both primary and harmonic frequencies.

A crystal-based tuning fork which resonates at “A” natural will also resonate in sympathy with any harmonic of “A” natural propagated across the entire wave spectrum if the wave form is detectable and of sufficient intensity to activate the crystalline structure of the tuning fork.

The crystalline lattice of the Soviet solar cell was deliberately designed and constructed to resonate at all the harmonic frequencies of the entire wave length spectrum, as defined by six discrete bands which embrace all known wavelengths. These bands are each a harmonic of the next, and all of them cause excitation (oscillation) of the crystalline lattice structure at the same time.

This phenomenon reflects a new feature of quantum mechanics, instantaneous simultaneity of crystalline oscillation regardless of the distance of separation. The potential of this phenomenon in future applications is truly awesome. Properly harnessed, for example, this property of crystal structures as defined by the IPMS version of quantum mechanics could make it possible to communicate over vast distances with no time lag. The oscillation characteristics demonstrated by these structures operate outside the normal context of space-time.

This writer, Gary Vesperman, happens to be the inventor of a major advance in torsion field communications, made possible by these special crystalline lattice structures. The maximum theoretical capacity of torsion field communications apparently is 40 billion channels of three-dimensional holographic television through the entire earth without attenuation at one billion times the speed of light.

It has long been recognized in the West that oscillating crystal structures can be engineered to create a usable flow of ions in the form of low-voltage direct electrical current. However, instead of relying exclusively on light in the visible spectrum alone to create ion flow, the Soviet system operates on all known ambient wave lengths simultaneously, in six harmonic resonant bands. It creates ion flow wherever and whenever such wave forms are present. It means that these devices operate on ambient heat remaining in a room or in the dead of night when there is no visible light present at all.

One more feature distinguishes the Soviet material from the Western photo-voltaic or solar cell. The Western cell operates by trapping photons of light in a cleverly designed network of glass, mirrors and other inter-connected reflective materials which are deposited on a substrate of a dielectric material. When the volume of "photon" traffic striking the dielectric material reaches a minimal threshold, electrical current is created.

That is, when enough photons have been captured to excite the surface of the substrate by either directly impacting molecules on the substrate surface or by creating heat energy sufficient to cause those molecules to oscillate, ion flow is induced. It is not a particularly efficient method, but it is the best that has been devised in the West.

In the Soviet material, because photons are known to behave in precisely the same manner as electrons, the photons (which are present in all wave forms, including visible light) are simply introduced to the energy wells between the tips of the molecular pyramids on the sheets of crystal lattice which overlay each other. The material is so efficiently designed that it actually absorbs (here is another place where imprecise common language gets us into technical difficulty) the individual photons in the same way it accommodates electrons.

During the discharge cycle, when a circuit is open and available, the photons simply follow the path of least resistance, which is out through the crystalline lattice and into an electrical circuit, energy storage device, or some other similar application.

The Soviet solar panel operates at a nominal efficiency of no less than 51% in the least consistent pieces which have been tested in the United States. The best pieces have produced test results demonstrating operating efficiencies in excess of 80%. These devices/materials produce electrical current at a higher rate per unit of exposed surface area in the dark of night than the best solar panel ever produced in the West will generate in the most ideal sunlight conditions.

The simple circular device attached to the Soviet satellite was a single solar cell which was used to power the entire ship and all its functions. The nuclear fuel signature detected by the Atlantis crew was nothing more than the emissions produced by a piece of spent nuclear fuel placed on board the satellite, intended to mislead the American surveillance team. It worked.

Advanced solar photo-voltaic cells produced by Em-Tech Technologies of Toronto, Canada, have demonstrated actual hands-on efficiencies in laboratory applications of more than 50%. These cells are based on designs developed by the IPMS. Theoretical models have yielded energy production efficiencies of more than 80%. These cells operate on such wide band-widths and at such high efficiency rates that their performance characteristics in the dark of night exceed those demonstrated in broad daylight by the best current, state-of-the-art solar cells produced anywhere else in the world. When applied to current global electric energy requirements for domestic, commercial, industrial and military use, the cost of electricity could be reduced to less than $.002 per kilowatt hour, with the added capability of operating not only in daylight but at reduced loads throughout the night, regardless of weather, on virtually any scale.

(When I, Gary Vesperman, was peripherally involved with the IPMS inventions during the 1992-1994 period by way of preparing Rodger Ward's electric car IPO, I heard a cute story. Ashurst Technology Corporation was based in Las Vegas, Nevada, where I was also working. Ashurst wanted to bring some of the IPMS scientists to Las Vegas and set up laboratories. The scientists, who were used to the much colder climate of Kiev, Ukraine, balked at moving into the hot desert. Toronto, Canada was chosen as a compromise location for Em-Tech Technologies.)

For comparison, the very best solar cells ever produced in the West have been produced by the Japanese. These cells operate at a maximum of 19% efficiency. That is, they convert as much as 19% of the ambient visible sunlight shining on a clear, cloudless day into ion flow, which then becomes low-voltage direct electrical current flowing through a circuit. The Japanese panels require months per section to manufacture and literally cost more than their weight in gold to manufacture. They are very heavy and are so sensitive to vibration and calibration that once installed, they cannot be moved at all.

Joint ventures of the IPMS with more than a dozen private sector companies to develop these useful inventions have been repeatedly sabotaged by the U.S. Government's Defense Intelligence Agency and others. (Source: David G. Yurth, *The Anthropos Files: Tales of Quantum Physics from Another World – 2nd Edition*, 2007)

David G. Yurth emailed to Gary Vesperman on August 5, 2007 his own suppression story:

When I was hired in the Spring of 1992 by Ashurst Technology Corp, whose offices were then located on Western Avenue in Las Vegas, I was assigned the task of understanding everything there was to know about the new sciences and technologies developed by the I.N. Frantsevic Institute For Problems of Materials Science between 1945 and 1991, when the Berlin Wall came down. The owners of Ashurst had accidentally hooked up with three top scientists from the Institute, as reported in the publisher's proposal I submitted to my agent in the Spring of 1994. (Yurth's proposal comprised the original edition of *The Anthropos Files: Tales of Quantum Physics from Another World*. "Anthropos" is a Greek word meaning 'of man' or 'things related to humans'. Yurth used it in the title to his book about IPMS technologies because it occurred to him that their epic scientific and technological achievements offer everything needed to save Planet Earth from what we humans have been doing to it.)

My publisher's proposal was released by my agent to former Secretary of Defense Frank Carlucci at a luncheon they both attended at the Washington Press Club two weeks after I gave her my manuscript. Two weeks later, two guys in dark suits and thin black ties came into my office and attempted to confiscate my computer and all my records. I called the police, had them arrested and then was forced by the Director of the Western Regional Office of the Defense Intelligence Agency to forego publishing the book for five years under threat of prosecution and personal injury. When you read the treatment, you will understand why it was important. That was a major league suppression exercise, the scope of which you will come to appreciate after you have read my manuscript. They are still successfully suppressing many of the technologies that are cited in that piece of work. (Some of them are described elsewhere in this compilation of energy invention suppression cases.)

However, the most important scientific technology suppression story, in my estimation, is the successful squelching of the report issued to Discover Magazine by the CDF Collaboration at Chicago's FermiLabs, citing the discovery and verification of sub-quarks as the constituents of quarks. I reported this information in my still unpublished book manuscript *Seeing Past The Edge* in considerable detail, including copies of the press releases and report abstracts issued by the more than 450 signatories to the report when it was issued. (This writer, Gary Vesperman, edited *Seeing Past the Edge*.)

If ever there was a significant suppression of essential, baseline scientific information, this was it. What it means to science, and what is suggests about the sufficiency of the Standard Physical Model is one thing. But what it says about the extent to which the gatekeepers for the scientific establishment are willing to go to suppress information that threatens their stranglehold on their own territorial imperatives is another matter entirely. If I were to choose between all the instances I know of scientific or technological suppression during the past century, this would have to be number one on my list, bar none.

Dave

Like energy inventors, physicists occasionally also encounter suppression. See http://rense.com/general77/21.htm.

Marshall Douglass Smith (Author): The Rise of Fascism in the American Energy Business

The ruthless geo-political strategy of corporate American energy oppression is clearly exposed by Marshall Douglass Smith in his book *Black Gold Hot Gold –The Rise of Fascism in the American Energy Business*. The book details the collusion of oil companies and the US military and federal government since the 1920s. A preview of Chapter 3 is available online at http://www.theforbiddenknowledge.com/hardtruth/black_gold_3.htm, and is recommended reading.

To be fair, an experienced oil and gas geologist, a friend of Gary Vesperman, thinks Smith's account is false of how the end of the Vietnam War was intentionally delayed until the very day that Standard Oil had completed its exploration of oil offshore of Vietnam.

And what do you suppose is really happening with Iraq and Iran? The *Los Angeles Times* article "It's Still About Oil in Iraq" (8 December 2006) -- see http://www.truthout.org/docs_2006/120906Y.shtml -- affords us some clues. The U.K. *Independent* article "How the West will make a killing on Iraqi oil riches" (http://news.independent.co.uk/world/middle_east/article2132569.ece, 7 January 2007), and Truthout's "New Oil Law Means Victory in Iraq for Bush" (http://www.truthout.org/docs_2006/010807A.shtml) confirm the suspicion of what many people think is the real reason why the United States invaded Iraq.

Perhaps the key to peace in Iraq would be to share Iraq's oil dividends among the Iraqi people, in the same manner that Alaska shares oil dividends (see http://www.iraqdividend.com). Instead, the American and British oil companies, in collusion with Bush administration, are planning to keep the lion's share. Realizing the real purpose of the U.S. invasion and reconstruction of Iraq, Iraq's oil workers unions are struggling to prevent the handover of ownership of Iraq's oil to foreign oil companies (see http://www.truthout.org/docs_2006/060907A.shtml).

To order a video about the US warning to the Taliban in August 2001 to allow an oil pipeline through Afghanistan --- or bombs would start dropping in October 2001 --- visit http://www.nutech2000.com/category1_1.htm.

It is logical to assume that the real reason for both Gulf Wars, and the interim between the two wars which featured US Navy patrols of Iraq, was to allow major American oil companies to use explosions from US Navy bombs – for well over a decade – to seismically explore for oil in the Persian Gulf off Iraq's shore, at nearly no expense to themselves, just like Standard Oil did during the Vietnam war.

Is it now time to explore for oil in the Persian Gulf off Iran's shore? But first the oil companies have to secretly stampede the United States and Iran into a very long war with each other…

CONCLUSION

It should now be evident that the oil/auto and power monopolies viciously defend their global energy markets by threatening, persecuting or even murdering targeted energy inventors, and even entire nations.

U.S. Patent Office Holds Secret 5000 Patents

The most straightforward way to suppress development of new sources of energy and still maintain an appearance of legitimacy might be by controlling the United States Patent Office.

Under the Invention Secrecy Act of 1951, the government may restrict the publication and dissemination of information about new inventions if their disclosure could be "detrimental to the national security." At the end of fiscal year 2006, there were 4942 invention secrecy orders in effect. These "secretized" patents are kept in the vault at the U.S. Patent Office (Park 5 Building). They never receive a patent number, and the inventor is rarely, if ever, compensated by the government for use of the invention. (Source: http://www.fas.org/blog/secrecy/2006/12/patent secrecy orders_lifted_o.html. Other patent secrecy links: http://www.fas.org/sgp/othergov/invention/admin.html, http://www.fas.org/sgp/othergov/invention/37cfr5.html, www.fas.org/sgp/othergov/invention/australia.pdf, http://www.fas.org/spp/starwars/, http://www.fas.org/blog/secrecy/2006/12/patent_secrecy_orders_lifted_o.html, http://www.fas.org/blog/secrecy/2006/12/navy_mind_control.html, and www.fas.org/sgp/othergov/invention/program.html.)

The U.S. Patent Office has a nine-member committee that screens patents in order to protect "national security".

An understandable reason for suppressing certain types of energy inventions is that the knowledge behind them is also capable of producing tremendously destructive advanced electromagnetic weapons such as the "death ray" apparently invented by Nikola Tesla and the Russian military's deployment of plasma beam weapons. Hence many such new energy technologies, particularly those using this kind of knowledge of advanced electromagnetic principles, are considered "dual use" technologies that are among the 5000 un-numbered patent applications confiscated in a vault at the U.S. Patent and Trademark Office because of their military potential and the need to keep that knowledge from America's enemies.

A hidden purpose of this committee is to also find and remove from public access energy-related patents which could threaten the fossil fuel and power monopolies.

Canada's patent office doesn't have a similar screening committee. It is recommended that energy patents possibly in danger of being classified should be first applied for in Canada. Once granted, up to one year is allowed to apply for the same patent in the U.S. Patent Office. Now the patent can not be classified because it is already out in the public domain, courtesy of Canada.

Text of Generic Patent Secrecy Order

SECRECY ORDER
(Title 35, United States Code (1952), sections 181-188)

NOTICE: To the applicant above named, his heirs, and any and all of his assignees, attorneys and agents, hereinafter designated principals:

You are hereby notified that your application as above identified has been found to contain subject matter, the unauthorized disclosure of which might be detrimental to the national security, and you are ordered in nowise to publish or disclose the invention or any material information with respect thereto, including hitherto unpublished details of the subject matter of said application, in any way to any person not cognizant of the invention prior to the date of the order, including any employee of the principals, but to keep the same secret except by written consent first obtained of the Commissioner of Patents, under the penalties of 35 U.S.C. (1952) 182, 186.

Any other application already filed or hereafter filed which contains any significant part of the subject matter of the above identified application falls within the scope of this order. If such other application does not stand under a security order, it and the common subject matter should be brought to the attention of the Security Group, Licensing and Review, Patent Office.

If, prior to the issuance of the secrecy order, any significant part of the subject matter has been revealed to any person, the principals shall promptly inform such person of the secrecy order and the penalties for improper disclosure. However, if such part of the subject matter was disclosed to any person in a foreign country or foreign national in the U.S., the principals shall not inform such person of the secrecy order, but instead shall promptly furnish to the Commissioner of Patents the following information to the extent not already furnished: date of disclosure; name and address of the disclosee; identification of such part; and any authorization by a U.S. government agency to export such part. If the subject matter is included in any foreign patent application, or patent, this should be identified. The principals shall comply with any related instructions of the Commissioner.

This order should not be construed in any way to mean that the Government has adopted or contemplates adoption of the alleged invention disclosed in this application; nor is it any indication of the value of such invention.

(The harsh punishment for a violation of this secrecy order, should an inventor exploits or even simply discusses his or her invention which is classified by a patent secrecy order, is 20 years in federal prison. In effect the U.S. Government brutally and suddenly orders unlucky energy inventors to keep absolutely quiet and not do any more work on their inventions – without compensation for their well-meaning efforts. Thus a shocked, intellectually shackled and frustrated inventor would end up losing everything he or she had invested in his or her invention. The public is also ruthlessly denied any benefits from the invention.)

US Congress: Energy Inventor Protection and Patent Declassification Act

The newly elected United States Congress should immediately write, introduce, and pass a bill titled, "Energy Inventor Protection and Energy Patent Declassification Act of 2007". Included should be 24/7 protection of energy inventors and their property by armed guards, and declassification of as many as 5000 energy patents unfairly held in secret by the U.S. Patent Office. (In spite of what one email correspondent suggests is the appearance of appointing a fox to guard the henhouse.)

Remy Chevalier suggests that the U.S. Congress needs to put back into question the entire review process of patent law, and its consequences on environmental health, by imposing strict fines to who ever is caught buying energy patents for the sole purpose of keeping its protocol out of commercial circulation.

In this fourth version of Gary Vesperman's compilation of specific energy invention suppression cases, the body count rose to a disgusting high of as many as 17 innocent people who were brutally murdered just to ensure the global market supremacy of giant energy monopolies. 31 energy inventors and associates are known to have been threatened with death, and 5 energy researchers and associates have been imprisoned or falsely charged.

The Congressional bill should also include a provision to hunt down and imprison for many years the secret government/corporate energy invention suppressors and their hired bullies and assassins.

The U.S. Congress in 2005 gave the oil companies $2.6 billion in tax breaks as a reward for $190 million in campaign contributions. (Source: League of Conservation Voters)

Wilhelm Reich: Orgone Energy Motor

In the mid 1930s Wilhelm Reich, MD, began noticing an energetic connection that is shared by all living beings and had the clarity of mind to not dismiss the observation as unimportant. Dr. Reich called this energy "orgone" and worked for decades demonstrating its laws and studying its various manifestations.

Dr. Reich in 1948 got a "synchro" type of electrical spinner motor to run from both an orgone energy accumulator and an orgone-charged high-vacuum tube. James DeMeo and Nicholas Reiter have each written an article on the orgone energy motor construction and use, with eyewitness quotes and many construction details. DeMeo has also published a third article on the subject of electrostatic motors, which are powered by sources bearing some resemblance to what Reich used in conjunction with the orgone accumulator.

An assistant, either suspected to be secretly working for the U.S. Government or was simply an incompetent and thief, had helped with its mathematics and construction. This assistant then took some of Reich's money and the motor with him that winter on the pretense of working on further refinements. Instead he disappeared. None of his claims about his past including previous employment were verifiable.

The U.S. Government then campaigned for many years to thoroughly ban and burn Reich's books and any other printed literature that included the word "orgone". U.S. Government violations at the time included the warrant-less invasions and searches of the homes of people peripherally associated with Reich. In one such case, a home was searched, and Reich's books were confiscated from private bookshelves. School teachers and doctors who worked with Reich were fired from their jobs.

Reich died at the age of 60 after serving eight months of a two-year federal prison sentence. Reich had been falsely labeled a quack and a racketeer by the U.S. Government and the corrupt American medical system. (Sources: Emails from James DeMeo, http://www.proliberty.com/observer/20030310.htm, http://www.orgonelab.org/cgi-bin/shop.pl/page=xpulse.htm, http://www.orgonelab.org/cart/xpulse.htm, and http://pw1.netcom.com/~rogermw/Reich/orgone_motors.html.)

Energy invention suppression much too frequently involves energy inventors unjustly being deprived of their constitutional rights. Years ago James DeMeo, Ph.D., wrote a scathing well-referenced article "Anti-Constitutional Activities and Abuse of Police Power by the U.S. Food and Drug Administration and other Federal Agencies" (see http://www.orgonelab.org/fda.htm). The flagrant abuses by the U.S. Government he cites are clearly reflected by U.S. Government-sanctioned energy invention suppression terror tactics. At its end, he lists the pertinent constitutional rights which for over two centuries hundreds of thousands of Americans have defended with their lives as sacred:

The Constitution of the United States Bill of Rights, 15 December 1791

Amendment I: Congress shall make no law ... abridging the freedom of speech, or of the press...

Amendment IV: The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated...

Amendment V: No person shall be ... deprived of life, liberty, or property, without due process of law...

Bruce DePalma (Interview): A Peaceful Revolution against Energy Oppression

A University of California at Santa Barbara 1983 interview by Daily Nexus Staff Writer Evette Justus quoted Bruce DePalma, local physicist and scientist:

"A peaceful revolution can occur providing we can free ourselves from the oppression which is dominating us and controlling our day-to-day existence. This oppression is the necessity to make payments to a system which gives us the energy to heat our homes, transport ourselves, brings our food and fertilizer to grow our food, and makes the plastic that goes into our clothes. When we can be released from that we will have a choice. And this can be the only revolution – a peaceful revolution, and free energy technology makes this peaceful revolution possible." (Quote submitted by David Crockett Williams.)

How to Stop Energy Invention Suppression

Compiling energy invention suppression cases is the most disgusting project this writer, Gary Vesperman, has ever done. All too many times while writing these stories, I have recoiled in dismay at the meanness of the energy invention suppression bullies who for DECADES have conducted their vicious operations paid for by giant lying greedy energy monopolies and their secret allies in the United States Government.

Even if HALF of these suppression cases can somehow be found to be false, the conclusion is still inescapable that we have a very, very serious problem of which very, very few people are even aware.

Hundreds of billions of dollars of energy business are at stake. I can not think of another issue that is more fundamental to American politics than energy invention suppression.

Energy invention suppression indirectly impacts on the largest scale economics, national security, foreign policy, Middle Eastern oil wars, the environment, food production, preservation of beloved parks and wilderness areas, protection of endangered species from extinction, trade balances, climate change, conservation of scarce natural resources, company and personal bank accounts, and the health and safety of ourselves and our loved ones.

The perpetrators of energy invention suppression constitute the world's single most powerful economic force. They are secretly committing acts of high treason for which their leaders should be hunted down and severely punished. The Internet can educate and empower a widespread grassroots revolt against energy invention suppression. To stop paying hundreds of dollars a month of tribute to the energy tyrants as soon as possible, each of us millions of energy consumers must again and again identify and carry out specific organized actions – the combination of which hopefully will culminate in a peaceful overthrow of those traitors, restoration of full constitutional rights to energy inventors, and gaining our rightful energy freedom.

- In each energy activist's immediate geographic area, establish or join an Adopt an Energy Inventor Group to financially support and even physically protect a local energy inventor against harm.
- Petition the U.S. Congress to pass specific legislation against energy invention suppression such as the above suggested “Energy Inventor Protection and Energy Patent Declassification Act of 2007”. One by one, each Congressperson must be closely questioned, monitored and held accountable for his or her actions concerning energy invention suppression. Government and corporate officials as well as Congresspersons who are found to be committing high treason by supporting often vicious energy invention suppression should be hunted down, quickly brought to trial and, if convicted, severely punished.
- Review and modify, where needed, existing federal and state laws and regulations which either intentionally or unintentionally suppress energy inventions. For example, in the suppression case described above of the Fish/Kendig Variable Venturi carburetors, the possibly corrupt California Air Resources Board forced a young college student to remove a Fish/Kendig carburetor from his Mercury “gas hog”, even though it doubled mileage and reduced pollution.
- Educate and persuade local groups, companies, labor union locals, and government agencies to pass resolutions advocating energy invention freedom.

- Monitor energy research web sites such as www.keelynet.com, www.rexresearch.com, www.zpenergy.com, www.nexusmagazine.org, www.pureenergysystems.com, www.orgonelab.org, www.bob-dratch.org, www.teslatech.info, www.byronwine.com, www.commutefaster.com, www.freeenergynews.com, www.padrak.com/ine, www.cheniere.org, http://peswiki.com/index.php/Congress:Member:Leslie_R._Pastor, http://www.atlantisrising.com, http://www.newenergycongress.org, http://peswiki.com/index.php/New_Energy_Congress, http://www.borderlands.com/freeenergy.htm, http://www.lenr-canr.org, www.green-salon.com, http://www.novainstituteoftechnology.com/, http://www.electrifyingtimes.com, and http://www.energysuppression.com.

- Sell or give away millions of "End Energy Invention Suppression Now!" T-shirts, bumper stickers, yard signs, banners, etc.

- Subscribe to and buy back issues of alternative energy research publications such as Fusion Facts, Cold Fusion Times, Nexus, New Energy Times, Infinite Energy, Extraordinary Technology, Journal of New Energy, Borderland Sciences Research Foundation, New Energy News, Electrifying Times, Space Energy Journal, New Energy Movement, German Association for Field Energy, Swiss Association for Free Energy, and Canada's Planetary Association of Clean Energy.

- The mission of http://www.energysuppression.com includes a repository of energy invention suppression cases. Energy freedom activists may post notices relating to putting a stop to energy invention suppression. Energy freedom activists who organize a local "Adopt an Energy Inventor Group" will find resource materials and a place to announce and coordinate their anti-suppression activities.

- http://www.energysuppression.com will enshrine an honor roll of "Warriors for Energy Freedom". These are companies, university student groups, labor union locals, individuals, environmental organizations, and other groups who advocate restoration of full constitutional rights and adequate financial support to inventors of new sources of energy. A description of their actions, which can be as simple as a publicly declared corporate resolution, would accompany their listings. New nominations will be voted in by majority vote of the New Energy Congress.

- http://www.energysuppression.com will display an "Energy Invention Suppression Hall of Shame" listing the names of those who have been clearly identified as perpetrators of energy slavery. New nominations will be voted in by majority vote of the New Energy Congress.

The U.S. Congress and the environmental organizations quibble about raising automobile mileage standards a paltry few miles per gallon. Let's get real! Let's instead now begin this ultimate environmental crusade with millions of bumper stickers, meetings, state legislative resolutions, demonstrations, emails, yard signs, labor union boycotts, T-shirts, energy inventor adoptions, movies, live concerts, crusades, letters and phone calls to the U.S. Congress, web sites, television documentaries, sit-ins, college lectures, protests, and banners in the streets and on vehicles blowing in the wind…

End Energy Invention Suppression Now!

DISCLAIMER: Inclusion of any invention or technology described in this compilation of energy invention suppression cases does not in any way imply its suitability for investment of any kind. All investors contemplating any investments in these devices and technologies should first consult with a licensed financial professional. Prospective investors should exhaustively perform their own investigation of pertinent facts and allegations of facts. Investors should also ensure thorough compliance with regulations of the federal Securities and Exchange Commission and appropriate state securities divisions. For more information, see http://www.zpenergy.com/modules.php?name=News&file=article&sid=1655.

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September 3, 2007

Thank you for your comment, Gary Vesperman.

The comment tracking number that has been assigned to your comment is SEDDsupp20012.

Comment Date: December 1, 2011 21:12:42PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20012

First Name: Gary
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Privacy Preference: Don't withhold name or address from public record
Attachment: Locomotive_Power_Sources.docx

Comment Submitted:

Attached is my compilation of candidate power sources for high-speed rail locomotives. It is available in my website www.padrak.com/vesperman.

My website also has my compilation of 95 energy inventions that have been thoroughly and sometimes violently suppressed by the U.S. Government and others.

Both of these documents include similar descriptions of the IPMS-developed thorium-227 electricity generator:

IPMS: Thorium-227 Electricity Generator

The I.N. Frantsevich Institute for Problems of Materials Science (IPMS), Kiev, Ukraine, from 1951 through 1991 secretly employed 6600 of the most brilliant theoretical physicists in the entire Soviet Union to work for nearly 50 years with complete freedom. They were able to develop whole new sciences, technologies and materials unknown in the West.

Their models of non-linear quantum mechanics, plasma physics, atomic engineering, nuclear physics and related mathematical and theoretical constructs, which made their development possible, are so unique that they challenge the validity of the most fundamental assumptions embodied in the Copenhagen Interpretation model currently held in general acceptance in the West.

For example, Western-developed particle/wave quantum mechanics is described by Einstein's E = MC2. The Soviet nonlinear model of quantum mechanics is described by the formula E = MKv [Energy = Mass @ rest as a function of a mathematical constant].

Einstein's theory of relativity assumes that the speed of light is constant. However, measurements have shown that the speed of light has slowed down 7 per cent over the past two centuries. (See http://worldnetdaily.com/news/article.asp?ARTICLE ID=39733.) Einstein's famous equation is therefore not based on the real world of peer-reviewed experimental results. Consequently the more correct Soviet model has enabled numerous technical advances not even dreamed of by Western science.

Among several energy inventions developed by the IPMS are free-standing thorium-227 isotope electric power generating plants. They can be small enough to power a single home and large enough to power whole communities. They also can operate for up to 18 years without ever requiring refueling or maintenance.

Arrangements to commercialize these useful energy inventions by joint ventures of the IPMS and more than a dozen private sector companies were repeatedly sabotaged by the U.S. Government's Defense Intelligence Agency and others. (Source: David G. Yurth, The Anthropos Files: Tales of Quantum Physics from Another World – 2nd Edition, 2007)

(End of excerpt)

This Draft Solar PEIS should precisely compare the cost-effectiveness of a World War II Manhattan Project-styled crash program to develop and commercialize the IPMS-developed thorium-227 electricity generator with covering and otherwise ruining millions of acres of pristine wildlands with relatively inefficient solar energy collectors and transmission lines.

Locomotive Power Sources

High-speed trains typically rely on some means of supplying energy to the locomotive from an external source. For example, cumbersome overhead electric lines are tapped to directly power a locomotive's electric drive wheels. Another method of connecting the locomotive to an electricity grid is with a dangerously exposed high-voltage third electrified rail. Linear magnetic propulsion mechanisms have been researched.

It would be much cheaper and easier to build and operate high-speed trains if their locomotives utilize an internal practically fuel-less power source.

The following candidate high-speed locomotive power sources appear worthy of further research. Some may be found to be worthwhile for building and testing prototype self-powered locomotives.

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BlackLight Power's Hydrino Generator

BlackLight Power, Inc., is developing an exotic new source of clean energy from ordinary water. Either an electrolytic cell or gaseous potassium ions in a vacuum compress hydrogen atoms into lower-energy-state hydrogen atoms called "hydrinos". When the hydrinos are formed, energy is released which in magnitude is between chemical and nuclear energy. BlackLight Power, Inc., has ambitious plans for retrofitting fossil-fueled and nuclear power plants.

BlackLight Power, Inc., is developing a 100-kilowatt generator which can power a car 100,000 miles on a tank of water. BlackLight Power, Inc., claimed some years ago that it is developing a 10-kilogram battery which can supply 150 horsepower for 1,000 miles.

BlackLight Power, Inc., has already licensed 8,250 megawatts of clean, safe hydrino generation fueled by water to seven utilities (Hoover Dam's nameplate capacity is 2,080 megawatts) – eliminating $2 billion/year in fuel costs.

Focus Fusion

See http://www.focusfusion.org/. Apparently this method is much less expensive than hot fusion.

Thorium PowerPack

Bob Dratch's thorium powerpack would generate electricity at approximately one-tenth of the cost of current methods of producing electricity. Thorium is sufficiently abundant that the entire planet can be powered for millennia. After ten years of continuous operation, a trace amount of U-233 is produced. U-233 recovery to re-purify the thorium is easily accomplished. Thorium thus lasts a long time when recycled and consequently is a very efficient energy source. After extraction from ore, thorium does not require energy-intensive enrichment as is the case with uranium.

A thorium-powered reactor is inherently safe. It doesn't run the risk of "meltdown" or explosion nor can even a dirty bomb be created. Its nuclear reaction simply stops when its neutron exciter is turned off.

The simplest and smallest "table top-sized " neutron exciter design is something close to the size of a 4-D cell flashlight, and starts at about 500-kilovolt neutron output. In fact this smallest most cost-effective system can run off 4 D cells for its power.

A thorium powerpack's neutron excitor does not use radioactive flux components as conventionally done for portable systems. Instead it relies on Dratch's invention of a novel method of resonant phonon pair cleavage using specifically designed nuclear lattice holo-forms (holographic waveforms) to induce neutron imbalance in a host atom where the host atom then attempts to establish "balance" through the liberation of neutrons. Dratch demonstrated the first model of this novel design back in 1966.

Commercial thorium powerpacks can be developed with 50 or 100 kilowatts of output for home use, and up to 1 megawatt for industrial use. They actually are "power amplifiers" with power outputs of 60 times over input power. Maintenance would be minimal.

IPMS Thorium-227 Electricity Generator

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Among several energy inventions developed by the IPMS are free-standing thorium-227 isotope electric power generating plants. They can be small enough to power a single home and large enough to power whole communities. They also can operate for up to 18 years without ever requiring refueling or maintenance.

Micro-Fusion Reactor Employing Stable High-Density Plasma Electron Spiral Toroids In Neutron Tube

Electron Power Systems, Inc., (EPS) has discovered the explanation for ball lightning and from that has invented and protected with five patents an Electron Spiral Toroid Spheromak micro-fusion reactor. Safe, pollution-free micro-fusion reactor-powered generators could reliably generate electricity with capacities ranging from 10 kilowatts through 1000 megawatts at the cost of 10% of today's electricity. All transportation vehicles could be reliably and safely powered with micro-fusion reactors with substantially lower production, operating and maintenance costs and without poisonous emissions. EPS expects to reduce the mass and cost of aircraft by 70%, and space launch costs by more than 95%.

Each year 15 million cars and trucks are sold in the USA, and 48 million are sold worldwide. EPS expects to eventually replace all of them with silent, reliable, safe, emissions-free micro-fusion reactor powered electric vehicles with substantially lower production, operating, and maintenance costs.

In addition, EPS has designed a 10kW generator that will operate on clean, non-polluting fuel, and can operate locally. This innovation will potentially improve the lives of most of humanity by making available low cost electricity that anyone can produce in their own homes. It will help literally billions of people. The paper design shows that the EPS generator will be the approximate

size and cost of a 10 kW generator available today in any hardware store, with the advantage that it will not use fossil fuels, but will use clean energy instead.

An article in the Institute of Electrical and Electronic Engineers, Inc., Spectrum magazine over ten years ago stated that world demand for electricity increases approximately 500 megawatts every day. To put this in perspective, the equivalent of another Hoover Dam would have to be built every four days to keep up with world electricity increase demands. The EPS innovation will make local generation possible without the need for more power plants or more power lines.

Major contributors to air and water pollution are the fossil-fueled engines of aircraft, farm harvesters and tractors, ships, boats, snowmobiles, trains, military vehicles, and all-terrain vehicles. Their engines could be replaced with cheaper electric motors and batteries charged by safe, non-polluting onboard micro-fusion reactor powered generators.

Electron Power Systems, Inc., (EPS) is an early stage company working to develop the Electron Spiral Toroid Spheromak micro-fusion reactor. From EPS will come new applications, including a practical micro-fusion electricity generator, a low-cost space launch vehicle, a high-kinetic energy anti-missile beam, and practical zero-emission cars, trucks, buses, farm equipment, construction equipment, military vehicles, and jet aircraft.

EPS is moving to commercialize these concepts. EPS has assembled a team of engineers, and plasma physicists, all as contractors. EPS is working on proof of concept demonstrations for the applications.

EPS plans to build a laboratory demonstration unit in two to three years with present funding levels, and then the first commercial prototype. Recent breakthroughs in the EPS lab give confidence this will happen within this timeframe. More funding will make this happen sooner.

EPS is seeking $2 million as a first round of investment to complete the development of a demonstration unit in eighteen months. A second investment of $8 million will be needed to complete a prototype unit in eighteen months after the demonstration unit.

Up until now EPS has had no sales and operates with funding from angel investors, each of whom is retired and has accumulated a substantial personal fortune, allowing these types of investments of high risk, high reward. EPS also operates with funding from the founder.

EPS operates on a low budget, spends only what it has, and has incurred no debt or obligations. In this manner it is able to operate indefinitely, while continuing to make progress each year. Additional small amounts of funding will speed developments.

EPS has made a new discovery in physics with the potential to locally produce low-cost, clean energy for homes and buildings, independent of power plants. EPS owns the new technology and plans to initially produce a safe, clean, 10-kilowatt electricity generator that needs no nuclear fuels nor fossil fuels and will produce no green house gases. A home owner would need a one-liter sized container of environmentally benign hydrogen/boron fuel per year at a 20:1 fuel cost savings compared to commercially produced electricity or fossil fuels.

EPS's new discovery would allow anyone worldwide to buy a small home generator, about the size but less than the cost of a Sears 10-kilowatt portable generator. It would power their home plus

several nearby homes even where there are no power grids or power plants. This will be a step towards providing low-cost, local electricity to help eliminate poverty worldwide.

EPS plans to build 10-kilowatt generators by applying its newly discovered technology to improve work done by others to create energy. The basic work was shown successfully in the 1980s at the University of Miami. But that technology had limitations at that time. EPS's new technology will overcome those limitations.

From a modest start with producing 10-kilowatt micro-fusion reactor powered generators, EPS expects to branch out to other applications of its technology as well as producing larger and larger generators.

Mankind's practically insatiable demand for energy implies a simply humongous market potential for EPS which would encompass all of the world's producers of oil, coal, uranium and electricity plus all manufacturers of transportation vehicles including cars, trucks, buses, farm equipment, ships, boats, construction equipment, trains, satellites, aircraft, snowmobiles, and military vehicles.

Several thousand neutron tubes are in use in the USA today that safely collide hydrogen ions to produce neutrons, which in turn are used for medical testing, industrial process control, and homeland security. An ion source produces hydrogen ions (deuterium), which are accelerated to 110 kilovolts, then directed to hit a hydrogen target (also deuterium), which produces neutrons, and also heat as a waste product. Neutron tubes today produce neutrons and a low level of heat energy. The low density of the hydrogen ions limits the amount of energy produced.

In the 1970's, Dr. Wells at the University of Miami collided two plasma toroids to produce low-level fusion energy in the TRISOPS system. The amount of energy produced was limited by the short duration time of the plasma toroids used, as well as their low density and their low level of energy.

Electron Power Systems, Inc., (www.electronpowersystems.com) has discovered a plasma electron spiral toroid that remains stable without magnetic confinement, by using background gas pressure for confinement instead. These new plasma toroids are observed to remain stable for thousands of times longer than classical plasma toroids, which opens the way for new clean energy applications.

EPS's new stable plasma electron spiral toroids overcomes each of the neutron tubes limitations, and will potentially result in fusion with no magnetic containment required – thus producing a practical micro-fusion reactor. EPS's challenge is to adapt the new stable plasma toroid to the TRISOPS method.

The micro-fusion reactor adapts the Electron Spiral Toroid (EST) Spheromak to the neutron tube design. The EST Spheromak is patented jointly with MIT scientists who also have published papers confirming the EST Spheromak physics and data. The EST Spheromak will overcome the neutron tube limitations by increasing ion density by 2500 times. A metal containment can be used for efficient heat energy collection and conversion.

The EST Spheromak micro-fusion reactor will be less than three feet in length, the same as for present neutron tubes, and small enough to fit in an electric car. Elimination of the need for magnetic containment allows this power supply to be small and compact. A micro-fusion reactor will use hydrogen/boron to produce clean energy without neutrons. The energy in one pound of

hydrogen/boron fuel equals the energy of 250,000 pounds of gasoline. Hydrogen and boron are plentiful and will not run out, as oil is projected to do in the 21st century.

The Electron Spiral Toroid Spheromak (ESTS) is a plasma toroid that is self-organized and self-stable with no magnetic fields needed to contain it. Inventor Clint Seward has not seen any published descriptons of any devices nor phenomena similar to the ESTS. The US Patent Office agrees and has issued five patents.

The micro-fusion reactor was recently selected by the New Energy Congress as one of the few technologies now known to have a genuine potential to replace fossil fuels. See the lengthy analysis of the micro-fusion reactor in http://pesn.com/2006/03/08/9600242_Spheromak_Plasma_Toroid/.

"Locomotive Power Sources" for high-speed rail in www.padrak.com/vesperman includes the micro-fusion reactor with BlackLight Power's hydrino generator, focus fusion, Robert Dratch's thorium powerpack, Kiev, Ukraine's I.N. Frantsevich Institute of Problems of Materials Sciences (IPMS) thorium-227 electricity generator, Clem over-unity vegetable oil engine, thin-film electrolytic cells, noble gas plasma engine, Searl effect generator, Magnatron - light-activated cold fusion magnetic motor, Oleg Gritsevich's hydro-magnetic dynamo, IPMS energy storage/battery device, metamatter which is solid crystallized fully-ionized plasma, Gordon Ziegler's electrino fusion power reactor, and environmental heat engines.

Some of these listed new energy inventions appear to have at least one limitation that is not shared with the ESTS micro-fusion reactor.

The Electron Spiral Toroid Spheromak (ESTS) micro-fusion reactor has five patents and is documented in published papers confirming the physics and data. (1), (2), (3), (4)

Clint Seward discovered the ESTS (5) while studying ball lightning. Seward has developed a secret formula to produce the ESTS that is not reported in any other reference to date that he has seen.

Why this is important is that all spheromaks reported to date dissipate in microseconds, while the ESTS has been observed to endure with no confining magnetic field for hundreds of milliseconds, and theoretically will remain stable for many seconds.

1. Seward, C., Chen, C., Ware, K., Ball Lightning Explained as a Stable Plasma Toroid. PPPS-2001 Pulsed Power Plasma Science Conference, June 2001.

2. D. C. Seward, C. Chen, R. Temkin, Energy Storage Device, US Patent 6,140,752, Oct. 31, 2000.

3. C. Chen, R. Pakter, and D.C. Seward, Equilibrium and Stability Properties of Self-Organized Electron Spiral Toroids, Physics of Plasmas. Vol. 8, No. 10. Oct. 2001.

4. W. J. Guss, Chen, C., Equilibrium of Self-Organized Electron Spiral Toroids. Physics of Plasmas. August 2002.

5. Seward, C., Ball Lightning Explanation, Leading to Clean Energy. Acton, MA 01720. Seward Publishing Co., 2011.

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But first EPS needs to obtain $2 million as a first round of investment to complete the development of a demonstration unit in eighteen months. A second investment of $8 million will then be needed to complete a prototype unit in eighteen months after the demonstration unit.

EPS's new discovery would allow anyone worldwide to buy a small home generator, about the size but less than the cost of a Sears 10-kilowatt portable generator. It would power their home plus several nearby homes even where there are no power grids or power plants. This will be a step towards providing low-cost, local electricity to help eliminate poverty worldwide.

From a modest start producing clean, reliable, safe 10-kilowatt micro-fusion reactor powered generators, EPS plans to methodically produce larger and larger generators. EPS even has a preliminary design with supporting calculations for massive 1000-megawatt baseload generators.

Mankind's demand for energy implies an enormous market for micro-fusion reactors encompassing all of the world's producers of oil, coal, uranium and electricity plus all manufacturers of transportation vehicles including cars, trucks, buses, farm equipment, ships, boats, trains, satellites, aircraft, mining equipment, snowmobiles, construction equipment, and military vehicles.

Countries which export oil will benefit from not having to quickly burn up their finite oil reserves on cheap gasoline and diesel fuel. Instead they will be able to draw down their reserves more slowly by making products of higher value such as plastics, medicines, fertilizers and synthetic textiles.

Some years ago a Forbes article stated that PECO (formerly Philadelphia Electric Company), with an income stream to back it up, was able to sell on Wall Street $4 billion worth of bonds paying 5.8 per cent. A micro-fusion reactor powered generator manufacturer could simply sell bonds to build and operate generators at a low interest rate. Generator loan payback times may be in the ball park of a half-year to a year, depending on the local electricity market price. As soon as a micro-fusion powered generator is paid for, the revenue from that time on would be almost pure profit. Once a track record is established by successfully installing a few micro-fusion reactor powered generators, Electron Power Systems, Inc., could raise money to build and install more generators by simply selling billions of dollars of bonds instead of stock. So therefore, there wouldn't be any dilution of ownership.

EPS plans to partner with major electricity producers and suppliers. EPS will license them to produce electricity as they do now. EPS plans to partner with automobile manufacturers to license the technology. EPS plans to partner with defense and aerospace contractors to license the technology.

MANAGEMENT

Clint Seward is the discoverer of the Electron Spiral Toroid Spheromak and received the initial patents. He has been working ever since to scale up the results, which he has been able to do recently. He has been a project design engineer and program manager for many years, working initially with the US Air Force B-58 Hustler program, and as a project manager and engineering

manager in several major corporations. His work was defense initially, moving to security and process control, then energy related.

Clint was an Engineering Manager for Mosler, an American Standard Division 1970 thru 1978, and an Engineering Manager and VP of Marketing for Bristol-Babcock 1978-1985 – an ACCO fortune 500 Company. He was General Manager of Iontrack, a Division of a large international company 1985-1989 (now a Division of GE). He has been President of his own company Electron Power Systems, Inc. from 1989 to present.

Education: MSEE; University of Michigan 1965; BS at US Military Academy at West Point 1963.

D C Seward is the VP Engineering of Electron Power Systems, Inc. He has worked on the micro-fusion reactor technology since its inception in 1986. He has the responsibility for organizing the experiments and bringing qualified people in to help with the work. DC has worked as the VP Engineering of EPS on a contract basis from 1998-Present as funding allows. He is employed full time as a Field Sales engineer for Ember Systems, a wireless technology company, 2005-Present. Previously he was a Product Design Engineer, Trimble Navigation: 1994-1998

Education: MSEE Massachusetts Institute of Technology, 1994.

Jim Becker is acting CEO and Marketing VP. Jim has experience as a senior executive in the high tech sector with extensive experience managing rapid growth organizations. He has a broad technology background with proven skills in computer systems, avionics industries, and health care information technology along with direct functional experience in finance, sales, marketing, engineering and corporate management in both domestic and international settings.

Education: Thayer School of Engineering, Dartmouth College; Master of Engineering 1976; Master of Business Administration 1975; Bachelor of Engineering 1970.

PAPERS AND PATENTS for Clint Seward:

Chen, C., Pakter, R., Seward, D. C. "Equilibrium and Stability Properties of Self-Organized Electron Spiral Toroids." Physics of Plasmas. Vol. 8, No. 10. October 2001.

Seward, C., Chen, C., Ware, K. "Ball Lightning Explained as a Stable Plasma Toroid." PPPS-2001 Pulsed Power Plasma Science Conference. June 2001.

Seward, C. "Propulsion Using a Stable Plasma Thruster." STAIF 2001, (Space Technology and Applications International Forum-2001). American Institute of Physics , www.aip.org/catalog/conforder.html. February 15, 2001.

Seward, C.; Chen, C., Temkin, R. ENERGY STORAGE DEVICE , US Patent 6,140,752, October 31, 2000.

Seward, D. C. Electron Spiral Toroid; US Patent 5,773,919; June 30, 1998.

Seward, D. C. Energy Storage System, US Patent No. 5,589,727. December 31, 1996.

Seward, D. C., Chen, C., Temkin, R. (1996b). International Patent Application WO 96/38848, Energy Storage Device, Published December 5, 1996.

Seward, D. C. Fixed Geometry Plasma and Generator, US Patent 5,175,466. Dec. 29, 1992.

ESP's President Clint Seward collaborated with Gary Vesperman in writing a description of Seward's invention in www.padrak.com/vesperman. See "Locomotive Power Sources".

The Products page of www.electronpowersystems.com sells a book "Ball Lightning: Leading to Clean Energy" and a paper "Spheromaks Observed Forming in Atmosphere". Paper's abstract:

Plasma toroids, called spheromaks, are reported here as observed forming in partial atmosphere from high power electric arc events similar in power to lightning ground strokes. The spheromaks are observed to be stable in partial atmosphere with no confining magnetic fields and are observed to last for more than 200 milliseconds in partial atmosphere. This paper describes the observations and presents a model that explains the properties of these spheromaks, which we call Electron Spiral Toroid Spheromaks (ESTS's) due to the spiraling motion of the charged particles. It includes four TV images. The model presented is a hollow toroid with a thin outer shell of electrons that all travel in parallel paths orthogonal to the toroid circumference, in effect spiraling around the toroid. A comparable inner surface of ions acts to neutralize the space charge. The paper provides formulas describing the ESTS. Potential ESTS applications include X-ray production, air defense, and energy production.

The cost to produce a 10-kilowatt EST Spheromak electricity generator would be about $1100 in production quantities. The EST Spheromak generator would have fewer parts than a comparable Sears generator.

Electron Power Systems, Inc., does not have a working prototype. The company has identified the instrumentation and needs another $100,000 for laboratory work. With $2,000,000, the company expects to have in two years a demonstrable prototype. In an additional year for $8,000,000 a production prototype is expected to be built. Remember, each piece of the project uses technology others have demonstrated.

Clem Over-Unity Vegetable Oil Engine

Richard Clem was a heavy equipment operator who had noticed that a hot asphalt sprayer would continue to run for up to an hour even after the power was turned off! So he built a modified version as a 200-pound engine which ran on vegetable oil at 300 degrees and was started by a 12-volt battery. The heat is internally generated by the engine. During a nine-day test conducted by Bendix Corporation engineers, the engine in its self-running mode consistently generated 350 horsepower into a dynamometer. The engine is constructed from off-the-shelf components except for a hollow shaft and a custom cone with enclosed spiral channels.

If the automobile industry adopts the Clem over-unity engine, motorists could change its eight gallons of vegetable oil only every 150,000 miles and never buy any gasoline. To illustrate the engine's durability, the only working model of the Clem engine has been continually running on his son's farm for several years.

Combining the Clem over-unity engine with the hydrosonic pump could provide distilled ocean water as well as hot water for space heating, kitchens, and bathrooms at *no* energy cost.

The Clem over-unity vegetable-oil engine is not patented. It may be fairly straightforward to set up a small machine shop for manufacturing hollow shafts and cones.

Thin-Film Electrolytic Cells

A number of seasoned technology integrators have developed thin-film energy storage technologies which hold considerable promise. Dr. George Miley, Dr. Robert Hockaday and others have developed thin film technologies with energy densities exceeding 250-400 watt hours per kilogram. Dr. Miley's invention is illustrative. Using a flowing pack-bed type electrolytic cell with 1-molar $LiSO_4$ in light water, 1mm plastic beads with a very thin [500-1,000 angstrom] film of metal [nickel, palladium, titanium] are employed. A special sputtering technique is used to spray the metals onto the surface of the beads. With 2-3 volts of electrical power and 1.5 milliamperes of current, the single film experiments have shown the material to produce more than 10 times as much output power as input. The input power is no more than 0.01 watts while .5 watt of heat is produced.

It is likely that the physics involved in this reaction involve the release of energy as a by-product of nuclear transmutation. Dr. Miley has written, "The key finding from these studies has been the observation of a large array of "new" elements (i.e., different from the original bead coating), many with significant deviations from natural isotopic compositions, after the run.

Great care has been made to ensure that these elements are distinguished from isotopic impurities by use of a "clean cell" with high purity components and electrolytes, in addition to the pre-and post-run analyses. Even low-energy radiation was detected from the bead days after each experiment. Applications to space power, providing a 1-kilowatt cell with only 500 cubic centimeters of active electrode is predicted." Note that this particular invention, with its large over-unity energy yield, was awarded a NERI grant by the DOE. At the insistent urging of the American Physical Society and representatives from MIT and other universities whose laboratories are currently engaged in high-temperature gas-cooled nuclear reactor research, Secretary Richardson eventually withdrew the grant. The tangle-footed Department of Energy actively discourages the development of new sources of energy, presumably to appease the oil, uranium and coal companies. The U.S. Patent Office has unfairly classified secret nearly 5000 energy patents. Luckless energy inventors then risk 20 years in prison if they work on, sell, or publicize their energy invention – often created at great personal sacrifice.

Searl Effect Generator

The Searl effect generator (SEG) can be used to charge the batteries in a self-powered electric vehicle. A solid-state device, the heart of an SEG is a series of three concentric magnetic rings with magnetic rollers going around the rings. Both the rollers and rings are comprised of four layers of titanium, iron, nylon, and neodymium.

The magnetic fields impressed on the rollers have both AC and DC components. The AC component is for floating the rollers so they don't touch the rings. The DC component is to prevent them from flying off. The innermost set contains a minimum of 12 rollers for the same reason that a linear motor will not operate with less than 12 phases.

The inner set of rollers travel around at 250 miles per hour, the middle set travels at approximately 600 miles per hour, and the outer set at approximately 1500 miles per hour. Hundreds of millions of volts are generated the energy of which is picked up by brushes positioned all around the outside set of rollers.

An SEG also creates an anti-gravity field. An uncontrolled SEG will rise about 50 feet as the rollers increase speed, emit a light blue halo which indicates energy is being extracted from the ether, and then shoot up into the sky gaining speed, never to be seen again. At least one roof has been holed by an SEG. The friction-less rollers can be prevented from reaching the critical velocity that produces lift by use of a “governor”, either mechanical or electronic.

An SEG can be easily controlled by immersing it in an electromagnetic wave field the frequency of which is a harmonic of the SEG’s primary frequency. While in resonance, the magnetic poles of the rollers reach a unification state, and they stop moving.

The inventor has built and flown a small “inverse gravity” vehicle. A flying saucer-like SEG-powered aircraft about the size of a bus is currently being built in England by a private group.

The inventor for some years independently powered his house off the power grid with a home-sized electrical generator version of the SEG. A householder could set up a 45 x 45-cm unit and generate an output of 11 kilowatts of free electrical power.

Oddly, a house powered by an SEG has been observed to have greater healing powers than conventionally electric powered houses. The healing effect is claimed to be due to the electrons zapping the occupants, taking away pain and returning blood more quickly to damaged tissue. The SEG would also help combat asthma, bronchitis, hay fever and lung complaints due to the increased supply of oxygen in the body. Conventional methods of electric power do not pump out electrons which results in tired eyes and a tired brain.

The SEG's negative charge also means that dust stays in the carpet instead of floating in the air. This is similar in action to negative ion generators sometimes sold as air fresheners.

Two Russian scientists replicated the Searl effect generator and vindicated all of these somewhat unusual claims. See their paper “Experimental Research of the Magnetic-Gravity Effects”, V. V. Roschin and S. M. Godin, Institute for High Temperatures, Russian Academy of Science, Izhorskaya 13/19, Moscow 127412, Russia.

At one time, a German power company reportedly considered replacing a nuclear power station with eight fuel-less SEGs costing a total of about $4.5 million and generating a total of 240 megawatts with no pollution.

Noble Gas Plasma Engine

Joseph Papp was granted US Patent #3,670,494 for his “Noble Gas Plasma Engine”. A mixture of recycled inert gases (helium, neon, argon, krypton, and xenon) is exposed to a high-voltage discharge in a sealed cylinder with a piston. The spark causes the gases to expand violently though no combustion occurs. Mechanical energy is delivered by the piston's displacement. The gases immediately collapse to their original density, and the cycle is repeated. After several thousand hours the gases lose their elasticity and are replaced. The operating cost is 15 cents an hour.

The first prototype was a simple 90-horsepower Volvo engine with upper end modifications. Attaching the Volvo pistons to pistons fitting the sealed cylinders, the engine worked perfectly with an output of three hundred horsepower. The inventor claimed it would cost about twenty five dollars to charge each cylinder every sixty thousand miles.

There were indications that such an engine could provide its own electrical power and being a closed system, require no fuel. It is not by definition an electromagnetic engine, however. It is believed that at the heart of the Papp engine is the development of high-density electrical charge clusters which provide the energy to expand the gases.

Other patents are 5319336, 4151431, 3670494, 4046167 - Mechanical Accumulator, 3680431 - Method and Means for Generating Explosive Forces, and 4,428,193 - Inert Gas Fuel, Fuel Preparation Apparatus and System for Extracting Useful Work from the Fuel.

Magnatron – Light-Activated Cold Fusion Magnetic Motor

During the late 1970's Howard Rory Johnson, a brilliant inventor in Elgin, Illinois, combined light-activated cold fusion with a new type of magnetic motor into a "Magnatron". His prototype Magnatron produced 525 horsepower but only weighed 475 pounds. It could propel a large truck or bus 100,000 miles on about 17 ounces of deuterium and 1.5 ounces of gallium before being recharged. This was years before either Pons and Fleischman or Dr. James Patterson entered the scene with their cold-fusion technology.

Johnson discovered the light-activated cold fusion portion of the Magnatron by accident when as he was developing a new type of electronic circuit using deuterium oxide and gallium, he noticed the two materials were producing energy on their own. He could not figure out what was triggering the energy production for some time until he finally discovered it was light.

The Magnatron's flow of deuterium (an isotope of hydrogen) is controlled by magnetic tunnels. At the point where the deuterium strikes the gallium (a heavy metal electron donor), a beam of light from a diffraction prism forces their fusion. That controlled reaction results in the fusion of two atoms forming a new atom. In the process, electricity is released, and that is what powers the magnetic motor. The Magnatron is sealed, however, so 'light' is provided from photon energy produced from coils tied directly to the motor. It is more or less a pulse-generated system.

A photon is a football-shaped particle of electromagnetic wave energy. Its energy content is a product of its frequency f and Planck's constant h. When an electron in orbit around the nucleus of an atom drops to a lower, less energetic orbit, a photon containing the energy equivalent to the electron's energy drop is emitted. This explains why light and other forms of electromagnetic energy such as gamma rays and radar are sometimes observed as particles and other times as waves. The heated filament of a light bulb is an example of photon production.
There is no way to explain, using contemporary electrical theory, how his relatively small motor could produce such tremendous horsepower. Utilizing his own new electrical-magnetic energy theory, involving a process he called "attract-attract", Johnson exploited the magnetic field. He used the top and bottom rotors in his motor. First, the top rotor attracted, released; then the bottom rotor attracted, released. The action of attraction, alternating between upper and lower magnets, used the windings to complete the attract field.

Robert Nelson's compilation of articles about the Magnatron provides much more technical detail on the Magnatron than the foregoing. (See http://www.rexresearch.com/magntron/magntron.htm.)

Johnson constructed his prototype Magnatron's 525-horsepower magnetic motor without any of the hardware that is presently used in present state-of-the-art electric motors. Conventional motors use the accepted principle of attract-repel, an energy form that doesn't utilize the magnetic field to its greatest advantage. For comparison, a typical 500-horsepower electric motor has wires exiting it that are the size of a garden hose.

The sealed self-contained Magnatron has no wires. Thus, other than the Magnatron's infrequent refueling with small amounts of deuterium and gallium, the stand-alone Magnatron uses no input power. The Magnatron's entire output power is conveyed by its magnetic motor's rotating shaft.

Fuel for the Magnatron is plentiful: deuterium is derived from water, and gallium is extracted from abundant aluminum bauxite. Commercially available pure gallium is still scarce and expensive. It may well be possible, however, to cheaply transmute another less expensive element into gallium. See Gary Vesperman's list of over two dozen methods of neutralizing radioactive waste in http://freeenergynews.com/Directory/NuclearRemediation/Vesperman/ which includes possible transmutation methods. Additional methods are briefly described in http://freeenergynews.com/Directory/NuclearRemediation/. Dr. Santilli's method plus an explanation of suppression of radioactivity neutralization methods are available at http://www.nuclearwasterecycling.com/. Robert A. Nelson's survey "Transmutations of Nuclear Waste" is at http://www.rexresearch.com/articles/nukewa.htm.

The Magnatron uses no fossil fuel in its operation, and it emits no pollution. The magnetic motor's RPM is 8,000 with a gear ratio of 2:1. Lubrication for the sealed motor is synthetic motor oil which does not need changing and does not need a filter, because foreign materials such as carbon and varnish are not introduced into the system, as they are in the internal combustion piston engine.

This writer, Gary Vesperman, attended the 3rd International Symposium on New Energy in Denver, CO (April 25-28, 1996). I remember being impressed by Gerald Orlowski"s lecture "Magnatron, Fusion Magnetic Motor", during which he provided substantial technical information on the Magnatron.

Orlowski reported that, "Some inside information revealed that OPEC had been keeping track of all competitive technology", and Johnson was #1 on their hit list! Johnson was about to manufacture the motors through a nationwide dealership. Some motors still exist, but the owner wants several million dollars for them."

This writer Gary Vesperman knows of very few inventions of new energy sources which are reasonably large stand-alone energy producers. Besides the Magnatron, they include Oleg Gritskevitch's hydromagnetic dynamo, and Electron Power Systems' micro-fusion reactor, which employs stable high-density plasma electron spiral toroids. Almost all inventions of new energy sources are, or claimed to be, relatively small over-unity power converters that convert input power to greater amounts of output power. Bob Dratch's thorium powerpack is an exception (see above).

At the September 14, 2005 public meeting in Green Valley Ranch casino regarding the proposed Regional Fixed Guideway traversing Las Vegas, Nevada, this writer Gary Vesperman submitted comments suggesting possible power sources for the train, including descriptions of the hydromagnetic dynamo and the micro-fusion reactor (http://www.rtcsouthernnevada.com/rfg/documents/September2005PublicMeetingMinutes.pdf, pp. 19-77).

No wonder the Magnatron's inventor, Rory Johnson, was rumored to have been "Number One" on Organization of Petroleum Exporting Countries (OPEC)'s hit list.

The following is an excerpt, slightly edited, from Orlowski's lecture transcript where he tells about his unwitting personal involvement with the U.S. Government's suppression of the Magnatron:

"After I saw the Magnatron motor, my life changed. I was no longer a happy camper working by myself in a wonderful, fully equipped research machine shop for the Greyhound/Armour Corporation in Arizona. While on a business trip, I saw this motor running in the Magnetron, Inc.'s showroom located in Eglin, Illinois.

"During my 15 years of electric motor repair, among the hundreds of motors I repaired, I rewound a 500 HP electric motor. That motor had wires exiting it that were the size of a garden hose. The Johnson motor being shown had NO wires. Surely this motor was unreal, a con-job to get money for dealerships. Yes, there he was, Rory Johnson standing next to his sealed self-contained electric motor.

"Upon returning to the Greyhound Towers and telling them what I had seen, they instructed me to call Mr. Johnson. Greyhound wanted Johnson to put forth a plan to install a motor in one of their buses for testing purposes.

"I called Johnson. He was delighted that a Greyhound employee had seen the motor running, and replied that the testing idea was acceptable. He would set a time frame for just when a bus should be delivered to him.

"Two years went by, with no business proposal from Johnson. Then, his former business partner, Mike Marzicola, called to say Johnson had passed away. He wanted me to work with him to get one of the motors running. I flew to Orange County, CA, saw the motor, took pictures, and put forth a plan to Greyhound. Subject to a contract with Marzicola, one of the old worn motors would be brought to the research shop. I would then very carefully reconnect the generator wires that Johnson had cut off prior to moving from Elgin, IL to California.

"Discussions with Marzicola brought out that the U.S. Government (given the authority by the Congress of 1952) had issued a GRAB order to take Johnson's motors. Rumor has it, the DOE is run by US oil companies and OPEC, and they want no competition, period. Because of this grab order, Johnson had cut the generator wires. He had then put his `total shop', with motors and all, on several U-Haul trucks and left Illinois in the middle of the night. He went to California to re-establish his business. But before he could get a motor running, he passed away.

"Surely, Greyhound would agree to let me re-start one of Johnson's motors. The wonderful proposal put forth to Greyhound was rejected by mail. Very agitated, I went to the top office at Greyhound demanding an explanation. I was met at the door with the comment, "We know why you are here." Knowing the potential savings to the bus company, surely they could have only one reason for rejecting the proposal. They must have believed I was not qualified to start up the motor.

"Greyhound's top legal advisor stated he was present when the Greyhound board met and discussed my written proposal. He stated the following, "At NO time was the thought put forth that you would not succeed. In fact, we discussed all of the hardware designed and constructed by you, and started the conversation from what happens when Greyhound has a running motor. We contacted a State representative who felt this motor should not be allowed to be used in 4,000+ buses. The loss in tax

dollars for fuel alone would be a very huge sum." He then asked me to leave, stating he was sorry that he had to tell me the reason the plan was rejected.

"Telling Marzicola of the rejection, I offered to personally put in a few thousand dollars toward the parts to get one motor running. In return, I would be assigned the dealership for the Phoenix metropolitan area. We signed legal papers in exchange for the money agreed on, and went to work. (I still have the signed dealership.)

"The first thing I noticed was that someone had been working on repairing the motors. Three motors already had new commutator assemblies installed. Each assembly consisted of 3 commutator assemblies on one insulated tube with a metal case to secure it to the shaft.

"One motor still had the old worn commutator assembly, as it had not yet been repaired."

Orlowski goes on to describe his reconstruction efforts and includes interesting technical details about the Magnatron's structure and theory.

Johnson did not know that OPEC tracks all potential competition to its oil business and that he was reportedly number one on OPEC's hit list. His first mistake was publicizing, in many magazines, his plans to manufacture and distribute his revolutionary motor.

Erik Masen has spoken with a few people who even signed up for distributorships. Erik Masen had included Johnson and his Magnatron in his energy invention suppression anthology (see http://www.electrifyingtimes.com/erik masen suppression.html).

In 1979, Johnson placed his engine in a Buick Electra and was preparing to drive it around the country to sign up more distributorships when the US Department of Energy and the State of Illinois teamed up to prohibit his company Magnatron, Inc., from producing and selling Magnatrons. They first placed a gag order on all the people in the company by using the Secrecy Act of 1952.

Secondly, the State of Illinois immediately requested the company to provide information about all of their employees, distributors, stockholders, investors, suppliers, etc. They asked questions that blatantly deny anyone's constitutional rights to privacy. The pressure from the State of Illinois became so overwhelming that Johnson decided to move his entire business to California in the middle of the night.

After a year of hearing nothing but silence from Johnson, Greyhound agents tried to contact him – only to be notified that he had passed away unexpectedly. This is a particularly troubling part of the story, since he had been in his early fifties and in robust health. Later, Greyhound learned that shortly before he died, Johnson had inexplicably moved out of his laboratory in the middle of the night and taken all of his motors and technology to California.

Bob Bass, in his report copied below on low-energy nuclear transmutation, claims that the CIA, the KGB and the Mossad, etc. all have "sprays" which can be sprayed upon someone and cause him or her to die of apparently natural causes. One speculation is that Johnson's death – apparently due to heart failure – had been artificially induced by such a spray.

In a January 20, 2007 email to Gary Vesperman, Terry Sisson reports:

"Hi Gary,

"I visited Magnatron, Inc., in July 1979. I wish I would have taken a photo. Placards were placed over every inch of the large windows in the front of the building listing all of the questions the State of Illinois requested his company to provide. He wrote, "When has the government ever had the right to ask this of any company." I peeked in the front window and saw one of his motors mounted on an engine stand. Nobody appeared to be there so I walked around to the rear of the building. I found the rear garage door open and could see the Buick Electra inside. I was about to approach nearer when a man emerged. We talked, but he quickly informed me that due to a US gag order he was unable to talk about anything. I managed to get his phone number and called him from time to time for years following. He was an assistant of Rory's and he kept the information very close to the vest. He did tell me that it was real and it worked, yet not how it worked.

"About 1984, I began to call all the Johnsons in the phone book in Elgin. I finally got a hold of Rory's son. He too said that it was real, but I got nowhere. Around 1992, I met Jerry Orlowski, and he told me his experience as the employee of Greyhound who was sent to investigate the technology, since he wound electric motors for several years. Jerry was very upset about the whole incident, particularly Greyhound's Board of Directors refusal to utilize the technology after he found the technology to be authentic. Jerry even witnessed the government's seizure of the motors in California. --- Terry Sisson."

Hydro-Magnetic Dynamo

The hydro-magnetic dynamo is a doughnut-shaped large-scale emission-free electrical generator which does not requires external fueling and operates safely, reliably and silently at moderate temperatures. The dynamo is capable of powering larger transportation vehicles such as buses, trucks, ships, locomotives, and airplanes. Doubt remains about making dynamos compact enough to power automobiles.

The circumstantial evidence for the Russian inventor's performance claims for his hydro-magnetic dynamo is reasonably strong. While three experimental prototypes have been built with Russian and Armenian expertise and equipment, a fourth demonstration prototype needs to be built with more modern Western engineering expertise and equipment to verify dynamo performance claims and to further explore the dynamo's potential capabilities. Performance claims are as follows:

Hydro-magnetic dynamos are scalable from 100 kilowatts to 1,000 megawatts. One doughnut-shaped, fuel-less 1000-megawatt dynamo is about the size of a two-car garage. For comparison, Hoover Dam's 17 generators have a total nameplate capacity of 2,080 megawatts. Seven 1000-megawatt dynamos can be vertically stacked to comprise a single 7000-megawatt dynamo.

A dynamo can reliably run continuously for 25 years or more with little or no maintenance, no external fuel source, and no pollution. If a dynamo's output is 1,000,000 watts, its total input power is approximately 10,000 watts. So the dynamo's energy efficiency is 10,000%, or 100 to 1.

The source of the dynamo's massive electrical output is a nuclear reaction which is not generally known to mainstream science. However, it is known that the dynamo produces alpha particles which are helium nuclei made from fused deuterium, an isotope of hydrogen with one proton and one neutron. The electrons missing from the helium nuclei are what seem to provide a copious "sink" of electricity, and which happen to be the secret to the dynamo's ability to generate an exceptionally large amount of electricity.

It is also known that the dynamo uses high-density charge clusters. High-density charge clusters are the basis of plasma-injected transmutation of elements and also neutralization of radioactive materials.

There were three dynamo prototypes built. The first two small experimental prototypes were built in Vladivostok. The third and last prototype continuously generated electricity, except when turned off to incorporate improvements, from 1992 to January 1997 in Armenia. (It was sadly destroyed during an armed rebellion by local religious fanatics who were unhappy with the Armenian government.) It generated a constant current of 6,800 amperes at 220 volts DC. That multiplies out to nearly 1.5 megawatts. The Armenian prototype dynamo's toroid weighed 900 kilograms and had a diameter of approximately 2 meters.

Cooling water is circulated through copper pipes wrapped around the toroid. The heat is expelled from the cooling water with a heat exchanger.

After a dynamo is assembled in a factory, the water is literally jump-started (by discharging a large bank of capacitors) to moving around the toroid. The dynamo's controls are temporarily set to generating enough of a modest amount of electricity to sustain itself, even while being transported from the factory to its site. For the Armenian prototype dynamo, two 10-farad capacitor banks (from Russian military radar stations) were used to provide the initial water motion (acceleration and excitation of water). Using a total of 20,000 joules, 100,000 volts with 0.05 amperes of current were applied to the Armenian dynamo for 3 - 5 minutes for starting its generation of electricity.

After these Russian radar capacitors were used to jump-start the Armenian prototype dynamo, a bank of buffer batteries sustained continuous operation when water motion and ionizing occurs. This battery bank contained 8 powerful 12-volt, 150-ampere lead batteries. The Armenian dynamo's sustaining input power was 14,400 watts. The nominal maximum output power is nearly 1,500,000 watts. Once, the output current was accidentally increased to 40,000 amperes for almost a minute. Fortunately, the power was reduced to a safe level before the water started to boil. Internal coils (windings) control water velocity and therefore dynamo power.

The dynamo's production cost is estimated at $500 per kilowatt which is competitive to nuclear power’s capital costs of $5,000 per kilowatt, windmill capital costs of $4,000 per kilowatt, etc. A well-run nuclear power plant can generate power for 1.5 cents per kilowatt-hour, coal 1.8 cents, natural gas 3.4 cents, and oil 4.1 cents, on the average. The dynamo’s operating cost would be approximately .1 cent per kilowatt-hour with no external fuel needed nor pollution.

Dynamos could replace all nuclear power plants, solar installations, wood-burning furnaces, hydro-electric dams, windmills, fossil-fueled power plants, etc. Satellites, locomotives, heavy trucks, buses, airplanes, and ships are obvious transportation applications. It does not seem that dynamos can be made compact enough to power electric cars although it certainly would be worth trying.

A Forbes article states that PECO (formerly Philadelphia Electric Company), with an income stream to back it up, was able to sell on Wall Street $4 billion worth of bonds paying 5.8 per cent. A dynamo manufacturer could simply sell bonds to build and operate dynamos at a low interest rate. Dynamo loan payback times may be in the ball park of a half-year to a year, depending on the local electricity market price. As soon as a dynamo is paid for, the revenue from that time on would be almost pure profit.

Once a track record is established by successfully installing a few dynamos, the dynamo company could raise money to build more dynamos by simply selling billions of dollars of bonds instead of stock. So therefore, there wouldn't be any dilution of ownership.

A recent IEEE Spectrum article stated that world demand for electricity increases approximately 500 megawatts every day. To put this in perspective, the equivalent of another Hoover Dam would have to be built every four days to keep up with world electricity increase demands. Or, a dynamo manufacturing company would have to build another 500-megawatt dynamo every single day of the year to keep up with world electricity increase demand in addition to replacing all existing generators fueled by hydro, nuclear, and fossil fuels.

The following is a highly condensed summary of the "Description" of the dynamo's Russian patent IPC H 02 K 44/00 “Method of deriving of electrical energy and organization of Gritskevich’s MHD-generator for its realization”:

The dynamo is a sealed toroid filled with distilled water with heavy water (deuterium oxide) added. Movement of water inside the closed loop and use of unique properties of water as a polar liquid cause a release of electrical energy as an outcome of a rupture of hydrogen connections. Additional electrical energy is drawn from nuclear reactions and micro-cavitational processes. The liquid gets ionized and moving around the toroid at start-up time by a running magnetic field with the help of stimulating electromagnetic windings.

A layer of segnetoelectrical material covers the internal surfaces of the toroid. 32 electrodes made from a hard-alloy material are inserted into the toroid at equal distances apart. These 32 electrodes are connected to a power supply. Additional stimulation windings are also connected to the power supply.

The partially pre-ionized (on the part of the heavy water) water gets ionized further by the high-voltage discharges by the 32 electrodes. With the help of the stimulation windings, a running magnetic field is created which moves the water in one direction inside the toroid. An electromotive force gets created by the electromagnetic induction in a separate set of windings. During the movement of the water stream free electrons get created, and an additional energy gets emitted because of the water’s friction (viscosity) against the layer coated on the inside surface of the toroid, because of electrostatic breakdowns of cavitatal-vacuum structures, and because of the ongoing nuclear reaction. 100 times as much electrical energy is generated as required for electrical energy input.

Note that the hydro-magnetic dynamo is always producing electricity once it is manufactured and jump-started at the factory. Whenever a locomotive is parked in sub-freezing weather, its hydro-magnetic dynamo’s electricity output would be used to heat the dynamo’s containment to prevent its water-filled toroid from freezing.

Whenever a locomotive is parked, its hydro-magnetic dynamo’s excess electrical output could be sold to the local power grid.

IPMS Energy Storage/Battery Device

During the summer of 1984, airborne intelligence surveillance teams of the United States Air Force, operating out of specially configured and equipped Boeing 707 airframes (called AWAC’s) electronically detected (and then shortly thereafter photographed) bursts of coherent light of

enormous power originating in the vicinity of Dushambe, Turkministan. The bursts of light, a brilliant blue-green color, lasted just a few seconds and were shifted almost to the ultraviolet end of the light spectrum. The "laser" beams were directed upwards out of the atmosphere towards American military communications satellites.

At precisely the same time the AWAC's detected and photographed the laser bursts (they were referred to in that jargon by American military analysts but later proved to be something almost entirely different), several of the satellites essential to America's global military command and control communications systems became inexplicably inoperable.

The Defense Intelligence Agency, under the direction of the National Security Council and assisted by the National Security Agency, escalated its surveillance of the remote site in the Ural Mountains from which the bursts first originated. For several months, during a concerted campaign of uninterrupted observation by AWAC's and American spy satellites, no additional bursts were observed or reported. Then, without warning, in the middle of the night nearly seven months later, AWAC's crews operating just outside the territorial airspace of Afghanistan detected similar laser bursts of lower intensity during a period of intensive localized ground warfare.

The Afghanistan bursts were apparently aimed at targets under attack by Soviet infantry units. The laser bursts continued in a sustained, localized but obviously mobile attack pattern, as frequently as four or five times per hour, until nearly sunset of the next day. Photographic evidence gathered at the time by the AWAC's crew, and later corroborated by photographs taken at the actual site of the fire fight and forwarded to the U.S. for analysis, showed that the targets of the laser bursts were ammunition and fuel supply depots located in the remote desert. Several of the ammunition and fuel caches had apparently been destroyed during the attack, as demonstrated by the evidence of explosions, fire, smoke and residual infra-red heat patterns detected, photographed and electronically recorded on-board the AWAC's.

All this information was transmitted (via encrypted communications bursts, routed through the military Global Command Control satellite system) to the National Security Agency (NSA), located at Fort Meade, Maryland. Analysts there recognized that they were looking at evidence of a weapons system which had never been observed before. They did not know what had produced the laser bursts. But they did know that the technology which made such a thing possible was not available to the countries participating in the NATO Convention. They were terrified at the implications of such a development.

Within hours, the information was packaged into classified documents and conveyed to the Joint Chiefs of Staff. The Joint Chiefs examined the information while they were being briefed by the AWAC's crews which had witnessed and recorded the events. After the briefing, the crews were dismantled, and their various members stationed far away from one another, with orders never to discuss the events they had witnessed. Officially, the laser bursts never had occurred.

Secretary of Defense Frank Carlucci took delivery of the packet at his residence in Falls Church, Virginia, three days later, at a private, secret meeting held in the middle of the night. No one has yet adequately explained why the Joint Chiefs waited three full days to brief the Secretary. Early the next morning, he was driven in a specially prepared bulletproof limousine to the White House. He personally delivered the information to the new President of the United States, Ronald Reagan. The content of the Secretary's report had an immediate, measurable impact.

It was this series of events which principally precipitated the Strategic Defense Initiative, a program of military defense and reprisal based on America's state-of-the-art satellite-borne laser-optical and particle accelerator technologies. The S.D.I. system was intended to provide the U.S. with a meaningful deterrent to further aggressive use of the technology developed by the Soviet Military.

There was only one problem with this system, aside from the fact that its astronomical costs almost bankrupted the American economy: it did not work. S.D.I. was designed to respond to a kind of technology which was not achievable in the West, and which could not be explained by any of the models, materials, technologies or sciences known in the West.

In 1985, the top-secret military version of the space shuttle, code named Atlantis, embarked on a special orbital mission. One of its mission assignments was to retrieve, examine or photograph the military spy satellites which had been disabled by the laser bursts recorded in 1979-84. The results of this investigation have not been declassified or released in any but the most censored version to the public. What we do know for certain, as a matter of publicly available non-classified information, however, is that each of the disabled satellites appeared to have had at least one, and in some cases as many as four or five precisely measured holes, approximately the size of an American silver dollar, melted completely through them from the outside.

The photographs taken of the satellites show evidence of intense heat, charring and carbonized residue evenly distributed around the perimeter of each hole. The evidence is clear and unmistakable – the satellites were disabled by a coherent beam of some sort, characterized by such intense energy that it was possible to melt consistently measured holes through the exterior and interior components of American military satellites, after having passed through the atmosphere of the planet and into space for as many as 325 miles. Such a thing has scarcely been dreamed of by the American military, much less put into any but the most nominally effective operational form.

After more than ten years of political, economic and technological wrangling, and after the expenditure of more than one hundred twenty billion dollars in largely ineffectual research and development efforts, it is inescapably clear that no amount of money or political pressure, no amount of geo-political posturing or economic sanctions was going to compel the disclosure or replication of the technologies which produced the results photographed over the Carpathian Mountains and the Afghanistan deserts. The Soviets had developed a weapons system which was so revolutionary that it could not be explained, replicated or defended against.

The Reagan Administration's lack of specificity about the nature of the implied threat to which S.D.I. was supposed to respond subjected the Administration, the Defense Department and the R&D proponents of the most prominent American aerospace corporations to an endless barrage of charges by the Press and the Congress. They were characterized as being disingenuous and accused of being unreasonably secretive during successive appropriations battles in the Congress.

The truth of matter is that the Administration and the Pentagon were not being disingenuous at all. They simply could not admit to the American public that they were attempting to develop an effective response to a weapons system which they did not understand and could not replicate.

There are a number of issues intrinsic to this set of circumstances, along with several dozen others which, though less well known or economically dramatic, are no less important from a technological standpoint. It is certain that the implication of these technologies has not been lost on those multi-national corporations whose entire capital structure may be threatened by the new

sciences, technologies and materials which have been developed in secret laboratories, hidden in caverns excavated beneath the Carpathian Mountains, in the former Soviet Union.

Over the past decade the West has enjoyed occasional gratuitous glimpses into the heart of Soviet science. Attempts to disclose or discuss these developments in the press have been ruthlessly suppressed by powerful special interests vested in both the public and private sectors.

The science which underlies the series of events recounted here remains at the outer limits of the most advanced technology of which the West is capable. The questions posed by the military and corporate analysts about this laser beam weapons system are far-reaching in their scope and implications. Some of them are illustrative:

1) New Model of Quantum Mechanics: The sciences and models of quantum mechanics which produced such stunning recent developments in the West as the laser and maser make quite clear how much energy is required to create a beam of coherent light powerful enough to penetrate the atmosphere, retain its coherence in spite of atmospheric diffraction (and other effects described in quantum mechanics as "thermal blooming"), and melt a two-inch hole clear through a satellite made of the most sophisticated alloys ever produced in the West. Except for limited short-distance demonstrations conducted with industrial grade lasers used in cutting operations, there is no known combination of materials or technologies extant in the West to make such a thing possible.

2) New Materials: The materials necessary to create an electrical charge large enough to power a device capable of producing such a beam certainly do exist. In quantum mechanics the term large enough does not make sense, but we can agree for the purposes of this discussion on the effect of it as represented by such commonly accepted constructs as frequency, voltage, current and ionic flow rates [as distinguished by the phenomenon of resistance].

Hydroelectric plants and large, fixed-base nuclear power plants are capable of producing enough energy to theoretically power such a device. But the energy bursts in both the Carpathians and the Afghan desert were generated by sources which moved from one location to another. In order to do that, several additional considerations must be addressed:

a. Portability: The power source would have to be transportable or be capable of storing sufficient energy to repeatedly power such a device. Western technology cannot produce either a portable power production unit or energy storage system capable of the performance requirements everyone agrees must be met to make the weapons system work, either in the laboratory or in the field. System portability was the most puzzling feature of the NSA/DIA report.

When carefully analyzed, the computer-enhanced enlargements of the photographs taken by the spy satellites and AWAC's crews failed to provide evidence of any tracks which could be attributed to wheeled or tracked vehicles operating in the precise locations and at the same time as the laser bursts which were observed. The implications of this set of circumstances was almost too much to believe – the devices were apparently either hand held or transportable and rechargeable in such a way as to allow them to be transported by one or more foot soldiers, without vehicular support.

b. Enormous Power Requirement: The materials and technologies used to construct a device capable of generating a beam of such enormous power and magnitude would have to be sufficiently advanced to enable the components to be transported without damage over significant distances in unpaved areas of very rough terrain. Such strategies, engineering techniques, construction technologies or materials do not exist in the Western inventory.

c. The continuous repetition of the laser bursts suggests that the devices can be operated repeatedly at short intervals of 12-15 minutes. This means they can be triggered with significantly higher frequency and intensity than anything which can be produced in the West, even for laboratory use. Industrial strength lasers used to cut metals require careful setup, accommodate only limited use in short bursts, require extensive cooling and must be continually recalibrated. These limitations obviously did not apply to the devices being operated in the Afghan desert. Analysts at AMTL agreed that the units would either have to be recharged via an external, independent device or somehow be capable of self-recharging in the field.

Such a thing is almost unthinkable by current Western military standards. Not only can we still not replicate the technology in any meaningful form, but the Soviets had refined the technology to a point which allowed it to be carried on the shoulders of ordinary foot soldiers and recharged in the field without motorized support.

Unbelievable! How was such a thing possible? According to some of the highly qualified scientists who scrutinized the photographs, it is not possible. The "Not Invented Here" syndrome is alive and well in the American engineering community. Some of them still insist that the pictures were either fabricated or demonstrate something completely different than this narrative suggests.

3) Energy Recharge-Batteries: How did such high-intensity laser beam generators get recharged in the middle of the Afghan desert, in the absence of powered support vehicles or fixed-based power plants? There are a number of possible alternatives. They could have been powered by some sort of advanced battery technology. It's possible, but if the battery technology used in the West is used as a model to support such a thesis, it would take a bank of the most sophisticated batteries ever designed by NASA, arrayed in series and parallel configurations larger than five full-sized Soviet T-60 tiger tanks to power such a device.

This theoretical battery bank, operating at 100% efficiency (which is not practically or theoretically possible; the best batteries manufactured in the West operate at less than 60% discharge efficiency), could conceivably produce enough direct current voltage (in a zero resistance super conductive circuit, which is not possible, either) to perhaps produce one burst of light equal in intensity to 20% of the power required to burn a 2-inch hole through a satellite moving at 20,000 miles per hour at a distance of 325 miles.
Soviet ground forces were generating bursts of this magnitude every 12-15 minutes for more than 10 hours with nothing but ground troops. During eight hours of this exchange, it was totally dark. Something pretty remarkable must have been going on to make such a thing possible.

4) Energy Recharge – Solar Cells: Another alternative would have been to have whatever energy storage devices were being used to power the "laser cannons" recharged by sunlight. The state-of-the-art in photo-voltaic cells produced in the West simply would not support such an undertaking. The very best solar cells ever produced in the West have been produced by the Japanese.

These cells operate at a maximum of 19% efficiency - that is, they convert as much as 19% of the ambient visible sunlight shining on a clear, cloudless day into ion flow, which then becomes low voltage direct electrical current flowing through a circuit. The Japanese panels require months per section to manufacture and literally cost more than their weight in gold to manufacture. They are very heavy and are so sensitive to vibration and calibration that once installed, they cannot be moved at all.

Photo-voltaic cells capable of providing enough electricity to recharge a theoretically infinite energy well would have to operate at efficiencies of 50-80% to recharge batteries of infinite electrical capacity with enough power to trigger such a device. Such cells would have to be very light weight and able to withstand extremes of heat, cold, vibration, dust, wind and other conditions encountered in a hostile battlefield environment. Nothing like that exists in the Western technological arsenal.

5) Dielectric Materials – Transformers and Capacitors: Another consideration must be reconciled before this issue can be theoretically put to rest. In order to produce a burst of coherent light of sufficient intensity to have the effect which was observed and recorded by the surveillance teams, the voltage and amperage required to support such a device would have to be staggeringly high. In order to operate at all, the voltage supplied to the system must be released all at once, not in a continuous stream but in a single coherent burst so intense that any materials known in the West would either evaporate or melt. Not only would the best dielectric materials known to Western Science melt because of the heat produced by such enormous energy bursts, but before a bolt of energy of this magnitude could even be released to such a device, it would have to be accumulated and stored somehow.

A similar set of requirements of a less dramatic type is present in all the electronic devices manufactured and marketed in the West. This includes the entire range of electronic devices such as VCR's, computers, televisions and sound components, telecommunications, information storage, transmission and retrieval systems of every kind. We could not live as we do without them. The components which convert, store and release ion flow into the circuitry of these devices are known as transistors, transformers and capacitors.

This discussion delves into a slightly technical area here, so non-scientific types will need to either become familiar with the fundamentals of electricity to understand what is meant or simply give it a possibility that what is developed in the next section is a true representation of the way such things actually operate. The discussion deals with such commonly used and seldom understood concepts as voltage, current, frequencies and resistance.

(a) Transformers convert voltage at one level of current (amperage) to either higher or lower voltage levels. When the voltage is increased, the amperage or current is proportionately decreased. A low voltage produced at a high current level can be transformed into a much higher voltage at a proportionately lower level of current or "power."

(b) Capacitors: The decrease in amperage which accompanies a transformation of low voltage to higher voltage is often compensated for by a device known as a capacitor. In the most simplistic terms, capacitors "store" electrical energy until the amount of voltage and current reach a certain minimal threshold. When that point is reached, the entire store of energy is released all at once in a single burst.

The tantalum materials used in the West to manufacture such devices conform to certain standard rules which are commonly accepted by electrical engineers. These rules have only recently been stretched by new technologies and materials developed in the West. For the purposes of this discussion, though, it is safe to say that electrical engineers have long relied on these rules because they have always produced the same results when applied in the same way. Here's an example.

It is standard engineering fare which dictates that a transformer capable of accommodating one volt at one ampere of current across a grid of one ohm of resistance will be one cubic meter in

dimension. If followed to its logical conclusion, this standard rule of electrical engineering would require that a transformer capable of supporting a laser burst device of the kind operated by the Soviet ground forces in the Afghan desert would have to be approximately the size of a building built on a base 100 feet to a side, nearly 150 feet high.

Surely such a device could not have been hidden from the AWAC's eye in the sky which can clearly photograph the letters on a license plate from 60,000 feet altitude, nor could it have been moved on the shoulders of ground troops without wheeled vehicular support. The fact that there was absolutely no trace of such a huge, massive transformer device (or any other kind of structure or vehicle which could be construed to serve that purpose) means that something else must have been used instead. Military analysts had absolutely no idea what it could have been.

Such a burst system cannot operate without a capacitor of some sort. A capacitive device capable of storing the amount of energy required to power a single burst from a laser cannon, made of the most advanced dielectric material known in the West, would have to have been equally massive and, further, would have to have been cooled by some sort of strategy which would have been instantly and unmistakably detected by the infrared cameras and spectroscopic scanners used aboard the AWAC's and the spy satellites which investigated the scene.

The practical requirements of such a system are best demonstrated by the massive equipment required to operate and cool the Super Conductor Super Collider linear particle accelerators recently designed by the United States and Japan. No evidence of any such capacitive device was recorded in either the Carpathian Mountains or the Afghanistan desert. How can we explain it?

Without going into any detail about how the technologies were developed, suffice it for now to say that the Soviet ground forces in Afghanistan were equipped with a prototype of a hand-held plasma beam accelerator, the likes of which had only been roughly imagined by American military analysts. The device relied on some innovative strategies. Among these were:

Energy Storage Devices: The power source for the Soviet light cannons was comprised of a back-pack array of specially designed energy storage devices. The closest thing we have in our vocabulary to compare to them is described by the term "battery." In the limited sense that these devices store electrical energy, they are batteries. Any other similarity to the batteries we are accustomed to in the West ends there. The literal translation of the Russian name for them is energy accumulators.

The batteries relied on in the West are based on the chemical properties of components which, when combined in certain configurations and proportions, interact chemically with one another. The result of this chemical interaction is that it creates both heat and a stream of liberated ions – electricity. In dry cell batteries, the process of chemical interaction is one way – once they have been expended, they are simply disposed of. It is estimated that more than 12 billion expended dry cell and lead-acid batteries are dumped into America's landfills every year.

Other batteries are designed and constructed so that the chemical reactions which liberate electrical current are reversible in some degree. These rechargeable cells are characterized by the lead-acid batteries which are used in automobiles and in commercial and industrial applications. Various strategies have been developed to make batteries relying on chemical reactions maximally effective, but the theoretical limits of effectiveness of such devices have surely been reached.

A consortium of aerospace companies working with NASA recently announced the development of an advanced sodium-hydride-based rechargeable cell which is the most efficient battery yet invented in the West. Unfortunately, it operates at an ambient temperature of 2000 degrees centigrade and, if allowed to reach temperatures outside a very narrow safe operating zone, will explode with the force of a small thermo-nuclear device of approximately ten-kiloton yield. It is not safe, but it is the best Western science has come up with.

The energy storage device developed by the I.N. Frantsevich Institute for Problems of Materials Science (IPMS), Kiev, Ukraine, works on a completely different principle. Its construction is the result of a completely unique nonlinear quantum mechanical model which makes it possible to create crystalline lattices of absolutely pure carbon (and other materials) in sheets of infinitely variable dimension which are exactly one molecule thick. The crystal formation techniques and the whole body of new science which allows for their creation in the first place are completely unknown to Western science.

The mono-molecular sheets deposited by this technique are wrapped back and forth on top of each other, more than one million times per millimeter, and are separated from each other by a distance of less than one atomic diameter. At this level of construction, the material becomes subject to the rules of quantum mechanics which are almost entirely probabilistic. That means a whole atom of carbon (or almost anything else except an electron or photon) will not fit in the space which separates the lattice sheets.

When viewed under an electron microscope, the sheets produce a pattern which looks for all the world like an endless field of four-sided pyramids, connected base to base, on a single plane, with the tips of the pyramids protruding endlessly, uniformly upwards. When wrapped back and forth on top of each other, these sheets of pure carbon crystal, made of carbon molecules shaped like trillions of identical tiny pyramids, all arrayed endlessly in identical formation, are positioned so that the tips of the pyramids on the bottom sheet are matched with the tips of the pyramids on the top sheets. What remains between the pyramid tips are open “spaces” or energy wells.

The quantum physics which describes the characteristics of the energy wells created between the layers of crystalline lattice is largely unknown to Western physicists. The Soviet model predicts with a high degree of probability that the quanta of energy referred to in the West as electrons (and, in some cases, photons), the stuff of which electricity is made, will, when introduced to the lattice structure, search, find and fit into the energy wells with military precision.

During the recharging or loading phase, the energy storage devices made of the crystalline lattice material channel one electron at a time into each well created by four carbon pyramids on the bottom layer and four carbon pyramids on the top layer. Because the rules of quantum mechanics which operate in this tiny environment demand it, each electron or quanta of energy has a certain polarity, spin and “color” (and other mathematically defined characteristics) which must be accommodated if it is to find, fit and stay in an energy well. Interestingly enough, when a current is applied across the lattice-work structure, the electrons behave precisely as nonlinear quantum mechanics predicts they will. They flow much like a fluid into the lattice field, then separate into individual energy quanta and spin into the last energy well in each layer, automatically adjusting their individual spin, polarity and color to match their characteristics to fit the requirements of each well, until the lattice is full.

Because no chemical reactions are involved in the process of marching electrons into or out of the energy well fields, there is no resistance in the circuit. In the absence of resistance, the electrons fill

the wells at light speed, never missing a space, automatically adjusting polarity, spin and other characteristics, and creating no heat. The amount of time required to "charge" such a cell is less than 5% of the time required to recharge a conventional chemical battery of similar voltage and current.

The validity of $E = MC^2$ is called into question by the way these devices function. When the battery is fully charged, it actually demonstrates more mass than when the energy storage device is empty or discharged. The laws of quantum mechanics relied on in the West state categorically that this is not possible. It is the answer to the question, "How much does a beam of light weigh?"

According to the Soviet model, this is precisely as it should be. When this phenomenon was first demonstrated to scientists in the West who were testing the energy storage devices at INEEL in Idaho, they were thunderstruck. The quanta of energy, or electrons as we refer to them, which are poured into the crystalline lattice demonstrate characteristics of mass even though they are bundles of pure energy sitting in stasis, literally at rest. The characteristic of mass is verifiable – you can measure it by weighing the energy storage devices before and after they are charged. When they are charged, they demonstrate appreciably more mass than when they are fully discharged.

If this is confusing to you, to suggest that pure energy can be shown to demonstrate verifiable mass while at rest (in stasis), perhaps you can begin to appreciate how fundamentally different the physics of all this is when viewed in the terms of Einstein's classic equation $E = MC^2$.

The existence of this technology clearly is proof positive that not only does energy demonstrate the characteristics of mass, but it does so in a state of non-motion or stasis, sitting idly in an energy well. A state of stasis is a very far cry from the terminal theoretical velocity required by the constant in Einstein's equation, equivalent to the square of the speed of light.

The scientific implications of this phenomenon are truly staggering. At very least, the verification of mass as a property of energy quanta at rest suggests that Einstein's theory of relativity may be altogether incorrect as a means of describing the dynamics underlying the real nature of the material world and its relationship to energy.

The existence of this technology suggests at very least, that energy and mass are equivalent characteristics of all things which are manifest in the material world. It is this fundamental contextual difference which distinguishes the Soviet model of quantum mechanics from the Western model. "The proof of the pudding," they say, "is in the eating."

Theoretical physicists may argue endlessly about the validity of the assumptions relied on by the IPMS scientists to develop their unique sciences, technologies and materials. But they cannot argue about the existence of the materials which have arisen from that context. They are as real as they can be. And they are unlike anything ever seen or contemplated in the West.

In the same way energy quanta stored in the energy wells of crystalline lattice materials demonstrate complete mathematical satisfaction with staying there indefinitely, when allowed to flow out in the form of an outgoing wave of electrical discharge, these quanta (electrons or photons, as you prefer) march right back out without resistance at light speed through a closed circuit to another use.

When these energy storage devices are discharged, they demonstrate other attributes which are not known in Western science, and which, because of the very nature of the chemical reactions we are accustomed to, are not theoretically possible according to conventional wisdom. Conventional

chemical batteries, when fully charged, produce electric current at a useable voltage for perhaps 30-40% of the total discharge cycle. After that, either the voltage or amperage (or both) drop to low enough levels that the devices being powered by them cannot recognize or use the electrical current which remains available. At that point, the batteries either have to be recharged or replaced.

The crystal lattice batteries have been demonstrated to produce precisely the same current and voltage levels throughout 98% of their discharge cycle. They produce no heat during discharge, regardless of the rate at which they are discharged. This is absolutely contrary to our experience with batteries, transformers or capacitors. Until the crystalline lattice materials were specifically engineered to register an electronically detectable blip at 95-96% discharge, it was impossible even for the scientists who developed them to distinguish a partially discharged battery from a fully charged one.

There is another characteristic which is intrinsic to energy storage devices which comes into play here. It is a characteristic of materials which is described as energy density. For non-scientific readers, this concept can simply be construed to mean the amount of measurable electrical current which can be produced by any device or material when its mass is converted into electrical energy. The concept is expressed in mathematical formulas as the number of watts and hours of consumable energy which can be converted from each kilogram of material. It is expressed as watt-hours per kilogram.

Here is an example we can all understand. Consider gasoline. When converted into electrical power at 100% efficiency, gasoline has been theoretically shown to have an energy density of between 550 and 600 watt-hours per kilogram of mass. In easy terms, that means that if one kilogram of gasoline were converted into pure electricity at 100% efficiency (with no loss due to heat, resistance, waste, etc.), the reservoir of energy would power a 100-watt light bulb for 5.5 to 6 hours.

Most of the high-end conventional automobile batteries of the lead-acid variety operate at an energy density rate of between 20-25 watt-hours per kilogram. The best NASA sodium-hydride batteries operate at 48-50 watt hours per kilogram. The energy accumulator devices which have been tested at the Idaho National Electronic Laboratories have demonstrated energy densities of between 850 and 1050 watt-hours per kilogram.

What does this mean in practical terms? It means, for one thing, that for the first time in the history of science an energy storage device has been created with an energy density which is greater than gasoline or any other refined fossil fuel. It means that devices which rely on these energy storage technologies can theoretically be designed to store and deliver clean electrical power at higher rates of efficiency than any fossil fuel ever discovered.

The global implications of this technology are irresistible. It means, among other things, that the technology exists, right now, to eliminate the need to build another nuclear power plant or dam another river to produce hydroelectric power. It means we can no longer justify burning another ounce of petroleum, another piece of coal, another cubic centimeter of natural (or unnatural gas) or another tree to produce heat, electricity or power for any purpose, including transportation.

When coupled with the plasma beam devices being tested by the Soviet infantry units in Afghanistan, these energy storage devices operated at such unbelievably high rates of discharge efficiency that they made it possible to repeatedly induce huge electrical discharges in a highly mobile configuration.

The same technologies which were used to produce the energy storage devices have been adapted to create transformers and capacitors with previously unimaginable performance characteristics. Instead of adhering to the conventional western model of "One Volt at One Amp across a resistance of One Ohm equals One Cubic Meter," the Soviets have produced a capacitor which measures more than 1200 farads at 10,000 amperes in a package the size of a tuna sandwich.

When tested by the Technology Materials Testing Laboratory of the Defense Department at the Pentagon and at the I.N.E.E.L. in Idaho, totally new testing equipment had to be designed, engineered and constructed just to test the devices. The scientists at those laboratories had never tested anything like these materials before.

Instead of having to house transformer and capacitor devices in a series of trailers towed by diesel tractors or huge fixed-base facilities, the operating apparatus which supplied transformed power and high intensity capacitive bursts to the light cannons weighed less than ten pounds and could easily be transported in a backpack by a foot soldier.

One final question remains unanswered. "How did the energy storage devices, once dissipated or discharged, become recharged in the field, especially in the dark of night?"

The back-pack plasma beam device detected by the AWAC's during limited combat use in the Afghanistan desert was powered by energy storage devices constructed of crystalline lattice materials. After each laser burst, the energy storage devices were recharged every 12-15 minutes (nearly 45 minutes in the dark of night – the residual ambient heat of the desert is a very efficient source of infrared energy) by sunlight, collected and converted to electricity by four-foot square panels of "solar cell" material arrayed on a pole like a flag, each weighing less than ten ounces.

The electrical energy stored in the back-pack energy accumulators was transformed into enormously high voltages and released at almost unbelievably high current levels when the super-capacitors were sufficiently charged. The beam of "light" detected by the AWAC's crews was a field of plasma, flowing at the speed of light and demonstrating characteristics of mass (and, therefore, kinetic energy). The phenomenon represented by these bolts of lightning are not comprehensible according to the model of quantum mechanics and plasma physics currently being used in the West.

Battery packs utilizing these energy accumulator materials have been designed, produced and tested which provide more than 14 hours of continuously transmitted power on a single charge to conventional hand-held cellular telephone devices. Similar improvements in conventional battery/energy storage capacity have been developed and are being tested for such devices as video camcorders, laptop and portable computers and other similar consumer, commercial, industrial and military applications.

IPMS research in the field of layered crystals has thus led to the creation of capacitors with a very high level of capacitance (measured in farads). This technology is based on a revolutionary production technique which forms polarized surfaces of one molecule thickness, separated by less than one atomic diameter of space, held together by weak Van der Waals energy forces. The special properties created by these layered crystalline structures provide previously unimaginable internal surface areas. Super capacitors are constructed of layered materials numbering more than one million dipole sheets for each millimeter of crystal thickness.

These devices provide a virtually limitless number of charge-discharge cycles at astonishingly rapid charge and discharge rates. The potential impact of such devices on all electronic equipment currently being produced is incalculable, since virtually all electronic devices rely extensively on the West's state-of-the-art tantalum capacitance technologies.

At present, IPMS has on hand (among others) a super-capacitor roughly the size and dimension of a sandwich which develops more than 1,200 farads at 10,000 amperes. It also boasts production of a battery whose active mass energy density exceeds 850 watt-hours per kilogram. For the non-scientist (and all the rest of us as well) this means that a "battery" has been produced which, for the first time in history, produces more power per unit of mass than any fossil fuel ever devised.

Prototype testing of larger-scaled devices designed specifically for providing power to electric vehicles is currently underway. Prototypes are expected to be capable of sustained highway speeds of up to 70 miles per hour with a range of 525 miles on a single charge. The power plant for this application has been recently improved by the inclusion of a proprietary solid-state ceramic electric motor which weighs 7.2 kilograms and produces 100 horsepower on 12-volt direct current. For comparison, an electric vehicle employing a 100-horsepower electric motor performs the same as with a 500-horsepower gasoline engine.

If these performance attainments can be sustained in broad-based applications, electrically powered vehicles could be produced which would meet or exceed virtually all performance characteristics currently available in equipment relying on internal combustion, petroleum-based engines. Gasoline/diesel-powered transportation devices can be replaced by cleaner, more efficient and significantly less expensive alternatives.

The world market for current energy storage applications which will be superseded by these energy storage technologies is estimated to be in excess of $24 billion per year (1991), exclusive of electric vehicle considerations.

Metamatter

9/25/1997 11:16 AM
From: Robert Bass
To: James Bowery<jabowery@netcom.com>;
CC: Robert W. Bass<rbrtbass@pahrump.com>;Gary Vesperman<vman@skylink.net>;
Subject: for the postulated "Bass page"?

Jim,

I just went to http://www.generalstore.com/ and see nothing but "under construction, etc." Is this you, or someone else in another state? Do you know how to (reasonably economically) do Mass-eMailings? Say either from a rented Data Base of known Investors, or just blindly to "millions"?

How about posting the following

Potentially Awesome Speculative Investment Opportunity?
==========
Venture SEED Capital? Low Risk, AWESOME Payback!!!

I seek one or more High-Technology-Oriented "High-Roller" Nerves Investor(s) who would be intrigued by the following proposition (if demonstrably sound and absolutely genuine): Suppose you go to "Super Monte-Carlo" in the sovereign nation of Erehwon, and you come to a table with a Croupier who says:

"I have here a coin the size of a U.S. silver dollar, which is perfectly evenly balanced between Heads and Tails to 10 decimal places [with the edge for Heads in the 11th decimal place]; and a certificate from the US Bureau of Standards certifying it is not "loaded" to favor either Heads or Tails to the best measurements they can make.

"You can flip the coin yourself.

"I have here Certificates of Deposit for $30 Billion in a centuries-old Swiss Bank of spotless reputation.

"My croupier's fee for allowing you to play is ridiculously modest.

"How much are you willing to wager on the honest flip?

"Now suppose the preceding scenario is repeated, except that several of the most reputable scientists in the world assure you that the coin is 'loaded' so that the chances of Heads are between 95% and 99%. Your own experts assure you that you have at worst One Chance in 20 of losing.

"Finally, the croupier says, you may play for $150,000."

To recapitulate, the odds are 20-to-1 that you will win $30 Billion, versus one chance in 20 that your entire $150,000 wager will be lost.

Would you play?

==========
-------PRIVATE Communication-----
------(NOT a Publication)--------
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I need Seed Capital of $150,000 under circumstances exactly analagous to those outlined in the Risk/Reward scenario above. If "Heads" comes up, then my patented Plasmasphere technology can be escalated to a Metamatter technology, where by METAMATTER I mean a solid, *crystallized* fully-ionized plasma.

An ordinary crystal has nuclei spaced apart distances of about 10^[-8] cm, the Bohr radius, because the electron cloud makes the atoms behave like little billiard balls of the size indicated.

However, in a plasma, the positively-charge nuclei and the electrons are equal in number, but the electrons are not in orbit around individual nuclei; they are "mixed up" as in a plum-pudding. Most plasma physicists will tell you that in order for hydrogen gas to be fully ionized (i.e., all electrons stripped from all nuclei) the temperature of the gas would have to be above 150,000 degrees Kelvin (i.e., 15 times hotter than the surface of the Sun). But this is demonstrably FALSE (both theoretically and experimentally).

If the gas is dense enough, it can be fully ionized at "low" temperatures, e.g. 5000 Kelvins [so-called "pressure ionization"].

Now suppose that the fully ionized low-temperature gas is condensed into the physical state of a liquid metal. I call this a Liquid Metallic Plasmoid (LMP). The characteristic of an LMP is that, like mercury, it keeps a constant volume; unlike a gas, it does not expand to fill all available space (if in a vacuum). The positive nuclei remain on average equidistant, and the electrons circulate around the dynamic lattice as in a giant crystalline molecule. Cook called it a "Cryscapade"; whereas others might call it a Liquid Crystal.

Fewer than a score people in the world understand that LMPs can exist. One LMP was photographed in half a dozen or so photos on the cover of the Journal of Applied Physics in 1957 by [later] Nitro-Nobel Medalist, physical chemist, Dr. Melvin Cook. The theory by which Cook explained his accidental discovery has been *independently* rediscovered (in 3 separate countries, USA, UK & France) by researchers seeking to explain the illusive natural phenomenon of Ball Lighting.

The late expert on High-Energy Lasers and Shock Tubes, Dr. Jay Blauer of Rockwell Rocketdyne, who died early of leukemia, helped me to design an experiment that would prove beyond shadow of a doubt that LMPs can be created at will. The basic idea is to use a combination of Shock Tube technology and High-Energy Laser technology, with my patented Plasmasphere technology, in order to achieve in a non-self-destructive, reusable device, what Cook discovered accidentally with high-explosives in a self-destructive experiment.

Once the mere EXISTENCE of producible-at-will LMPs is achieved (for the Risk Capital of $150K), it will be trivially easy to raise several million more for refinement of the device to move the LMP into a cryogenic vacuum chamber where (since it is electrically conductive) it can be magnetically levitated and allowed to cool by radiation.

Use of the Brush-Sahlin-Teller Equation of State (used to design the H-bomb) shows that as the LMP cools, its volume contracts, and it becomes more and more dense. There can be shown to scientists sufficiently expert to understand the evidence, a mass of recent experimental evidence (as well as expert theoretical evidence) that before the LMP gets down to room temperature it will crystallize into a Metastable Solid Crystal, namely a *new form of matter* never seen before on Earth!!!

The density will be intermediate between that of ordinary condensed matter and that of neutron stars, wherein a teaspoonful weighs tons.

I propose to manufacture 3 kinds of Micro-Crystals of Metamatter: MSP, MSD, and MSD. Each addresses in a truly *revolutionary* way a trillion-dollar market, with a multi-billion dollar profit potential. In many ways, Metamatter will have a bigger impact on human civilization than any prior discovery, including both computers and atomic energy! In fact, consider the following:

MSP (Meta-Stable Protium [hydrogen]) will be the IDEAL room-temperature Superconductor, which will revolutionized both the Computer/Electronics industry and the Electric Power industry.

MSD (Meta-Stable Deuterium [heavy-hydrogen]) will be the ideal 5th Generation Cold Fusion fuel; when triggered by an infra-red photon of 17.7 eV, a micro-pellet will undergo a phonon-mediated and Lattice-Catalyzed ANEUTRONIC chain-fusion reaction to cleanly release the energy of 10

sticks of dynamite, to make steam for mechanical heat and conversion at 67% efficiency into electrical energy. This can make both homes and automobiles independent of the present electrical utility companies, though they will still need to buy the almost dirt-cheap MSD fuel micro-pellets from Metamatter Industries.

MSH (Meta-Stable Helium) will be the IDEAL rocket propellant for expanding human civilization into the Solar System (e.g. to colonize Mars); when a micro-crystal of MSH is triggered by the right frequency of laser-light, it will return to the form of gas as if it had been compressed by tens of millions of atmospheres of pressure; it will release 43 times more energy per unit weight than any conceivable chemical combination!

During the mid 1980s, the Air Force Systems Command sent a group of 7 or 8 Colonels who held Doctorates in the physical or engineering sciences to scour the USA for 9 months, in groups of 2 or 3, and to report back on what futuristic technology would have the greatest potential impact on the USAF and USA economy by the year 2000 if reduced to actual practice. They listened to 600 industrial and academic presentations and selected MSH as the greatest payoff (for least risk) choice! The USAF Rocket Propulsion Lab was supposed to issue 8 parallel contracts for 8 "crash" projects to see if bulk MSH could be manufactured. I was slated to get one of the 8 contracts, but my approach (through solidifying a helium LMP) was radically different from that of the other 7 selected proposers.

With MSH as fuel, one could take a 50 percent payload to Mars and back in two weeks! (Accelerate there and return at one gee.)

But a Princeton professor of Physics, Will Happer, then Secretary of the JASONS [advisers to DOD/DOE], advanced theoretical arguments which appeared to shoot down the practicality of the other 7 approaches, and the whole project was canceled. But Happer's arguments are totally irrelevant to my approach. Moreover, Happer was later Chief Scientific Advisor to Admiral Watkins (Secretary of DOE) when the ERAB Report was produced.

Those who understand the recent work of Arata and Zhang in which the aneutronic conversion of deuterium nuclei to helium nuclei inside of a palladium lattice is recorded in Real Time (inside of a sealed apparatus which contains a Mass-Spectrometer and which give ZERO helium when the heavy-water deuterium is replaced by ordinary-water hydrogen) know that Aneutronic Cold Fusion (CF) is a demonstrable FACT and that Happer and the ERAB Report were WRONG. Therefore it is logical to consider the possibility that Happer was also wrong when, before he shot down CF, he also shot down MSH.

There is ZERO risk in producing an LMP; it is just that 99.999% of all scientists are ignorant of Cook's work.

There is a slight technical risk in crystallizing an LMP at room-temperature; conceivably, it will remain liquid until below the temperature of liquid nitrogen, in which case my proposal will have been a failure. But the payoff is so AWESOME, and the chances of failure so tiny, that the risk seems worth taking.

I can supply drawings of the Proof-of-Principle Process Prototype Plasmasphere demonstration designed by Dr. Blauer and myself. Jay Blauer told me that he could do the experiment in his spare time evenings and weekends "in two weeks" using shock-tube and laser equipment already in his lab at Rocketdyne, provided he had $10,000 cash for items and materials not on hand.

Several "reputable" labs have explained to me that they would not even consider bidding on doing the Bass-Blauer experiment for less than $100,000. I have personal contacts at 22 government and private labs (such as JPL, SRI, LANL, etc.) which I would like to visit with my former graduate student Dr. Lou Puls (who, unlike me, is an accomplished experimental plasma physicist) to make joint presentations on the theoretical and experimental aspects of creation of an LMP, preparatory to asking them to bid. After 22 weeks spent in such visits, (and paying Dr. Puls Consulting Fees) I expect to have $50,000 left to offer the Highest Bidder. I also expect that no one will bid less than $100,000. But I also expect that out of the 22 presentations, at least several will become so excited that they will offer to Cost Share. In several labs, the working-level scientists interested in LMPs have told me, "If you can get the Management to pay attention, we have in place already a mechanism and a precedent to Cost Share."

Remembering what happened to Fleischmann and Pons it will accomplish naught for me to take the $150K, rent the equipment, and do it in my own garage. Nobody will believe it, and nobody will pay any attention. However, if we spend 6 months getting suitable technical personnel of nationally reputable laboratories excited about the subject of LMPs, and then some lab with the prestige of, say, JPL or LANL or SRI, announces the production of an LMP, many other labs will immediately undertake to "catch up" and to replicate the result at their own expense. Once 3 or 4 labs have announced successful replication, no one will doubt and then it will be trivially easy to raise the venture capital to go from LMPs to solid, crystallized Metamatter micro-crystals of MSP, MSD, and MSH.

I can supply a large amount of written technical material to anyone who is interested in raising the $150,000 seed capital required to get Metamatter Industries off the ground (and for me to file the pioneering Patent Applications, and since I am now licensed to practice Intellectual Property Law before the PTO I can do it myself at no extra expense – as did the physicist/patent-attorney who invented the Xerox process).

This will be BETTER than getting in on the ground floor of Xerox or Polaroid or Microsoft!

Sincerely,

Robert W. Bass, M.A. Oxon, Ph.D.
Dr. Robert W. Bass, Registered Patent Agent 29,130 [ex-Prof Physics]
Inventor: Topolotron, Plasmasphere, issued; QRT Cold Fusion, pending
P.O.Box 1238, Pahrump, NV 89041-1238; phone/FAX (702) 751-0932/0739
Voice-Mail: (702) 387-7213 e-Mail: rbrtbass@pahrump.com

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XXX.YYY
XXX Venture Partners

Dear XXX,
Have you got your _____ Fund off the ground yet? Did you receive the Proposal I sent you last week?

Do you agree that the logic of the Analogy I used for the proposed Low-Risk, AWESOME Payoff, "Proof-of-Principle" (POP) Experiment is sound? If a rational Investor were convinced (e.g. by the photos published by Nitro-Nobel Medalist, Melvin Cook) that it is possible to put a plasma in the state of liquid metal (Liquid Metallic Plasmoids, or LMPs), and that the ONLY risk is that when cooled to room temperature they will not yet crystallize [but won't crystallize until down below, e.g.. the temperature of liquid nitrogen], which risk will be taken by OPM [Other People's Money] when the scientific community realizes that LMPs can be created at will, and that there is ZERO risk in performing the proof-of-principle demonstration experiment to convince them of this fact, and that this can be done for as little as $150,000 (which will also permit Patent Applications ensuring the inside track when LMPs get crystallized), don't you agree that the Reward to Risk Ratio of $3 X 10^[10]/$1.5 X 10^[5] = 2 X 10^[5] multiplied by the probability of crystallization at room temperature (which is supported by hundreds of theoretical papers on MSH and at least one recent paper in Physical Review Lettersw on MSP, as much, much better than 50%), namely an EXPECTED REWARD/RISK RATIO of more than 100,000-to-1 implies that this Proposal is "better" than any proposal made in this field yet, when you note that each of the 3 main products to be manufactured from crystallized LMPs, namely MSP, MSD, and MSH, EACH separately addresses a different Trillion-Dollar Market with a clear Profit Potential of more than $10 Billion?

Moreover, this is a Proposal in which the Investor who RISKS $150K will know within a mere 6 or 7 months WHETHER OR NOT Phase One of his speculation has paid off! (And it is highly likely that the Absolute Answer will be known within another 3 months, considering how fast the scientific community reacts to something, e.g. High-Temperature Superconductors, which is both surprising and EASY to replicate!)

Please tell me when a Speculative Investment Possibility better than this one has last crossed your desk? (I'll bet, NEVER!)

Regards,

Bob Bass

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Electrino Fusion Power Reactor

Gordon L. Ziegler has discovered how to make a clean electrino fusion power reactor capable of generating up to a net of 1880 megawatts of DC electricity. The proposed energy source would produce no carbon emissions and no radioactive wastes. (By reversing the order-to-disorder arrow in the second law of thermodynamics, a $50,000,000 electrino fusion power reactor could be built which would also reverse all aging, disease, and decay processes within a one-mile radius.)

Power output, however, cannot occur in this system without the simultaneous operation of two aspects of the invention. One is an accelerator-collider making a field reversing the order-to-disorder arrow in the second law of thermodynamics in a controlled area. Among other things, that field makes the other aspect of the system (the power source) efficient enough to be self-sustaining and prevents the formation of radioactive wastes.

Electrons are generally regarded to be structure-less spinning point charges. But that contradicts a reasonable postulate that occurred to Gordon L. Ziegler in 1967: “A spherically or cylindrically symmetric smooth charge distribution cannot have detectable spin.” Electrons have detectable spins. Therefore they must not have smooth structure-less symmetric charge distributions. They must be lumpy and have internal structure. An application of the Parsimony Principle shows that they must be composed of two half-charges orbiting each other at the speed of light. The reason scientists concluded that the electron was structure-less was that it could not be blasted apart in collisions up to 700 MeV each particle.

But in Ziegler’s model, electron sub-particles are bound together by confinement by a speed of light barrier (they are trapped going faster than the speed of light). They cannot be blasted apart, even though they are two particles.

The two sub-particles of electrons make a whole different structure for matter than quarks and leptons. The sub-particles can also fuse with each other – making new particles. Fusing sub-particles of positrons reverses the order-to-disorder arrow in the second law of thermodynamics – making the power source efficient enough to be self-sustaining and preventing the radioactive wastes from forming. Fusing the sub-particles of electrons comprise the power source.

Key components include a polarized positron source, injector accelerators, inflection magnets, end magnets, and the beam transport.

Governments and utilities would buy electrino fusion power reactors because the process is a clean, inexpensive way to produce electricity. It is 1000 times as efficient as nuclear reactors. It does not require uranium or plutonium for fuel. It can run on anything for fuel such as dirt, sand, sewage, ground garbage, toxic chemicals, radioactive wastes, sea water, etc. without carbon nor radioactive pollutants.

Assume that the collision energy were 940 MeV to avoid unwanted heat (operate at room temperature), and the current in each beam was 1.0 ampere of electrons. The energy investment into the electrino fusion would be 1880 megawatts. The energy released in annihilation photons would be 3760 megawatts. Recoverable net power would be 1880 megawatts or less.

The collision energy of the linear accelerator would be 940 Mev (each particle – 1880 MeV in the center of mass frame). The current in each beam would be 1.0 amperes of electrons. There would be two beams 180 degrees from each other.

The energy released in annihilation photons would be 3760 megawatts. "Annihilation photons" are the 940 MeV X-Rays produced when a negatron annihilates a proton. These X-rays are converted to electricity by order-to-disorder arrow reversed photo-voltaic cells with nearly 100% efficiency.

In summary the 3760 megawatts output of annihilation photons would be converted to electricity. However, in order to keep the electrino fusion reaction going, 1880 megawatts would be taken from the 3760 megawatts to power the linear accelerator. The net energy output would thus be 1880 megawatts-electric.

The size of an electrino fusion reactor would be about 80 ' x 10' x 10'. The fuel is whatever brass or copper James M. Potter uses in constructing the walls of his linear accelerators. James M. Potter, Ph.D., is President, JP Accelerator Works, Inc., 2245 47th Street, Los Alamos, NM 87544, 505-690-8701 or 888-301-2833 or 505-661-8155, jpotter@jpaw.com, http://www.jpaw.com. 155 lbs of

brass would be consumed over 100 years before shutdown for refueling. The linear accelerator would be a standard commercially available model. It would not need to be customized for an electrino fusion reactor.

The smallest electrino fusion reactor that would be possible to build is now about 80' x 10' x 10'. It may eventually be the size of a filing cabinet.

The projected cost of the first 1880-megawatt electrino fusion reactor is approximately $100 million. This clean source of electricity could be built in two years, and the necessary Refresher built in one year. Electricity could be generated for only about 1.5 percent of current rates (a little over 0.1 cent per kwh). Subsequent clean energy sources can be built for $37.5 million each.

The 1880 megawatts (net) of electricity generated by an electrino fusion power reactor would be Direct Current (DC). A utility would need thick wires and the biggest busbars and transformers on the planet. Conversion from DC to Alternating Current (AC) would require the world's largest inverters.

The electrino fusion reactor requires the Refresher to be self-sustaining. But the Refresher has several positive medical side effects due to reversing the order-to-disorder arrow that cannot be eliminated – in a controlled area reverse adult aging and wipe out diseases.

Refresher 1
Design Specifications

Size of accelerator	20 meters long by 3 meters wide
Diameter of channels	4 cm (maybe a little more to allow for water cooling channels)
Type of accelerator	Folded linear accelerator with pulsed klystron RF power supplies and S-band cavities (2856 MHz)
RF power supplies	Eight 35 to 50-megawatt pulsed klystrons
duty factor	0.1% (peak current 1000 times average current)
Average power	400 kW (20 kW per meter of accelerator)
klystron efficiency	~50%
total system power	800 kW
cooling water requirement for each 5 m section	5 to 10 gpm

cooling water required by each klystron	~ 5 gpm
cooling towers capacity	800 kW

Cost:

Linear accelerator	$12 million
Klystrons	$ 8 million
Klystron power supplies and cooling towers	$ 2 million
Magnets and their power supplies	$ 2 million
System with controls	$ 8 million
10% contingency	$ 3.2 million
Builder's cost	$35.2 million
Other budgeted items	$14.8 million
Total budgeted	$50 million

Creation time total	3 years
Design time (beam dynamics, rf power systems, cooling, and computer control)	1 year
Fabrication and subassembly testing	18 months
Installation and commissioning	6 months

(The following chapter is taken from *Formulating the Universe*, Volume II, by Gordon Ziegler, Chapter 7. Copyrighted by Benevolent Enterprises 2004. Used with permission.)

Chapter 7

SECOND LAW OF THERMODYNAMICS

A. Introduction

Everything goes from a state of order to more disorder. Brand new automobiles wear out and rust. Objects break or are damaged. A thermos bottle falls off the counter, and the inner glass bottle is shattered. We do not expect the shattered bottle to fall back up to the counter and become whole again. There is a one-way arrow for the events to transpire. That arrow is the Second Law of Thermodynamics.

Houses grow old and fall into decay. Barns fall down. Fruit spoils, people and animals grow old and die. Viruses mutate. People become ill and die. Crime and disorder in society increase. Homes break up. Aborted fetuses disintegrate. Dead people and things decompose. All of these negative occurrences are the outworking of the second law of thermodynamics – that part of which is an arrow making everything go from order to disorder.

Let us consider what other people have written about the second law of thermodynamics.

"Second law of thermodynamics

"An equilibrium macrostate of a system can be characterized by a quantity S (called *entropy*) which has the following properties:

"(i) In any infinitesimal quasi-static process in which the system absorbs heat dQ, its entropy changes by an amount

$$dS = \frac{dQ}{T} \qquad (7\text{-}1)$$

where T is a parameter characteristic of the macrostate of the system and is called its *absolute temperature*.

"(ii) In any process in which a thermally isolated system changes from one macrostate to another, its entropy tends to increase, i.e.,

$$\Delta S \geq 0. \qquad (7\text{-}2)$$

"The relation (7-1) is important because it allows one to determine entropy *differences* by measurements of absorbed heat and because it serves to characterize the absolute temperature T of a system. The relation (7-2) is significant because it specifies the direction in which nonequilibrium situations tend to proceed."[1]

The above expression of the second law of thermodynamics is regarding entropy and heat. Other writers include the order-to-disorder arrow in the second law of thermodynamics.

"It is a matter of common experience that disorder will tend to increase if things are left to themselves. (One has only to stop making repairs around the house to see that!) One can create order out of disorder (for example, one can paint the house), but that requires expenditure of effort or energy and so decreases the amount of ordered energy available.

"A precise statement of this idea is known as the second law of thermodynamics. It states that the entropy of an isolated system always increases, and that when two systems are joined together, the entropy of the combined system is greater than the sum of the entropies of the individual systems. For example, consider a system of gas molecules in a box. The higher the temperature of the gas, the faster the molecules move, and so the more frequently and harder they collide with the walls of the box and the greater the outward pressure they exert on the walls. Suppose that initially the molecules are all confined to the left-hand side of the box by a partition. If the partition is then removed, the molecules will tend to spread out and occupy both halves of the box. At some later time they could, by chance, all be in the right half or back in the left half, but it is overwhelmingly more probable that there will be roughly equal numbers in the two halves. Such a state is less ordered, or more disordered, than the original state in which all the molecules were in one half. One therefore says that the entropy of the gas has gone up. Similarly, suppose one starts with two boxes, one containing oxygen molecules and the other containing nitrogen molecules. If one joins the boxes together and removes the intervening wall, the oxygen and nitrogen molecules will start to mix. At a later time the most probable state would be a fairly uniform mixture of oxygen and nitrogen molecules throughout the two boxes. This state would be less ordered, and hence have more entropy, than the initial state of two separate boxes."[2]

"The explanation that is usually given as to why we don't see broken cups gathering themselves together off the floor and jumping back onto the table is that it is forbidden by the second law of thermodynamics. This says that in any closed system disorder, or entropy, always increases with

time. In other words, it is a form of Murphy's law: Things always tend to go wrong! An intact cup on the table is a state of high order, but a broken cup on the floor is a disordered state. One can go readily from the cup on the table in the past to the broken cup on the floor in the future, but not the other way round.

"The increase of disorder or entropy with time is one example of what is called an arrow of time, something that distinguishes the past from the future, giving a direction to time."[3]

B. Electrino Model and 2nd Law

The natural tendency of leptons in beta decay is that the parent lepton combines with one or more gravitons to produce more particles. In all natural reactions, the order energy of the resultant particles is less than or equal to the order energy of the original particles.

1. Negative Energies. Let us consider antimatter more carefully. "In the Dirac theory also, *the permissible energy values for a free particle range from $+mc^2$ to + 4 and from $-mc^2$ to - 4.* The first of these results is of course just what we expect for a free particle – that its total energy can have any value greater than its rest energy. But the second result is quite puzzling, since it implies the existence of states of *negative total energy.*"[4] Anderson in 1932 discovered positrons in cosmic radiation. These were regarded as Dirac's negative energy particles. "The first two solutions of the Dirac equation . . . clearly describe a free electron of energy E and momentum **p**. The two negative energy electron solutions . . . are to be associated with the antiparticle, the positron."[5]

However, in the annihilation it is not $(+mc^2) + (-mc^2) = 0$, but $2mc^2$ is the result of annihilation.[6] There is something strange going on with the minus signs in these equations. The calculations are inconsistent.

Maybe there are two kinds of energy considered. One we can call entropy energy E_S. In the annihilation reaction, $\#+mc^2\# + \#-mc^2\# = 2mc^2$. Entropy energy is the higher value. The other energy is order energy E_O. In order energy the same reaction is $(+mc^2) + (-mc^2) = 0$.

Let us consider entropy energy and order energy for particle decay schemes. There are a few decay schemes where no negative order energy (anti-matter) is introduced in the right hand side of the decay schemes. In those few instances, the final order energy is equal to the initial order energy (when kinetic energy is taken into account). But in most cases, a trace of negative order energy (anti-matter) is introduced into the right side of the decay schemes. There is nothing on the left hand sides of the decay schemes to correspond to this addition of a trace of negative order energy on the right sides of the decay schemes. Therefore, total order energy is less on the right hand sides of the decay schemes than on the left hand sides (if only by a trace). A few decay schemes introduce a lot of antimatter (as K^-) on the right side of the decay scheme. The loss of order energy in the systems is greater in those cases. But in every case, for all natural processes, the order energy final is # the order energy initial, or

$$\Delta E_0 \leq 0. \qquad (7\text{-}3)$$

Let us check the order energy for electron electrino fusion reactions. Electrons made energetic by acceleration (as heavy as protons) fuse and form anti-protons. Matter is converted to anti-matter. Entropy energy is conserved, but not so order energy. Order energy is reduced in the extreme from +938 MeV to -938 MeV or more for each electron fused (two electrons are fused in each reaction).

The order-to-disorder arrow for electron electrino fusion points in the usual direction. The system does obey the second law of thermodynamics.

2. Reversing the Order-to-Disorder Arrow. What would happen if we fused the electrino constituents of positrons instead of the electrino constituents of electrons? Entropy energy E_S would again be conserved. Entropy would be increased. However, order energy E_O would go from -2 x 938 MeV to +2 x 938 MeV – from disorder to order. The order-to-disorder arrow would be reversed. This would be a reaction that would be prohibited by the second law of thermodynamics – unless the strong gravitational force that fuses the anti-semions would be stronger than the second law of thermodynamics (which otherwise governs weak interactions). The stronger of the strong gravitational force and the second law of thermodynamics should be determined by experiment. More rides on that one experiment than perhaps on any one other experiment in this generation. If it is found that strong gravity is stronger than the second law of thermodynamics, then order can be restored at first in a small area, and then for the whole earth.

Here we see that the entropy arrow of time and the order-to-disorder arrow of time are separate and distinct, and are not one and the same thing. While all the reactions the author has studied increase entropy, the fusion of positron anti-semions reverses the order-to-disorder arrow, making more order out of the disorder.

Positron constituent electrino fusion might not only take the electrinos from disorder to order. It could make other physical processes in a local area go from disorder to order. The positron fusion not only violates the second law of thermodynamics, it reverses the order-to-disorder arrow of that law in a local area, making other processes in that area reverse. Let us consider that process more to see how it might be regulated.

We guess the desired relationships for reversing the order-to-disorder arrow in the second law of thermodynamics through dimensional analysis. We want to solve for r, the maximum radius in which the reversed law would be effective. There is a way we can obtain a length from combinations of our variables and constants. That way is in the right hand side of Eq. (7-4). The whole expression is the thermodynamic relation we are seeking. The thermodynamic relation is:

$$(\Delta E_o)_t > 0 \ \textit{where} \ r < \frac{(\Delta E_o)_1 \ c}{ik}, \qquad (7\text{-}4)$$

where E_o is the order energy – the positive or negative energy in the pair production of particles; ΔE_o is the change in the order energy, where $(\Delta E_o)_t$ is the change in the total order energy of the system, and where $(\Delta E_o)_1$ is the change in the order energy for a single source reaction – for a positron fusion reaction it is approximately 2 x 10^9 eV/collision x 1.6 x 10^{-19} joules/eV = 3.2 x 10^{-10} joules/collision; c is the speed of light – approximately 3.0 x 10^8 m/s; we shall solve for the effected radius r; i is the beam current in each beam in Coulombs per second (we will solve for 10^{-11}); k is the ratio of particle energy to particle charge. This energy per charge is the accelerated energy of the particle (roughly 1 x 10^9 ev times 1.6 x 10^{-19} joules/ev = 1.6 x 10^{-10} joules) divided by the charge of each positron (q = 1.6 x 10^{-19} coulombs), which equals 10^9 joules per coulomb. The collision efficiency eff is not needed in this equation, because the result is not in particles, but is already in collisions.

Incredibly, the lower the current, the bigger is the radius of the affected area. The greater the current, the smaller is the radius of the effected area. With 10^{-11} A beam currents, the effected

radius r solves for 9.6 meters – roughly 10 meters, which describes a small area – less than a tenth of an acre.

To get an idea of the positron beam currents needed to reverse the order-to-disorder arrow of the second law of thermodynamics in what size of affected radius, see Table 7-1 below.

For an area the size of	r	beam current
House	10 m	10 pA
four football fields	100 m	1 pA
community	1 km	100 fA
city	10 km	10 fA
Israel	160 km	0.6 fA
U.S.	2,400 km	0.04 fA
World	13,000 km	0.008 fA
Sun	1.7E11 m	6E-22 A

Table 7-1. Beam currents versus affected radius for reversal of the order-to-disorder arrow of the second law of thermodynamics.

We must make sure that reversing the second law will do only good and not evil before we flip the switch. Inspired evidences will be studied in the next chapter on a wide range of phenomena affected by reversing the order-to-disorder arrow in the second law of thermodynamics.

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[1]F. Reif, *Statistical Physics*, Berkeley Physics Course--Volume 5 (New York: McGraw-Hill Book Company, 1967), p. 283.

[2]Stephen Hawking, *A Brief History of Time*--From the Big Bang to Black Holes (New York: Bantam Books, 1988), pp. 102, 103.

[3]*Ibid.*, pp. 144, 145.

[4]Robert B. Leighton, *Principles of Modern Physics* (New York: McGraw-Hill Book Company, Inc, 1959), p. 665.

[5]Francis Halzen, Alan D. Martin, *Quarks and Leptons* (New York: John Wiley & Sons, 1984), p. 107.

[6]David S. Saxon, *Elementary Quantum Mechanics* (San Francisco: Holden-Day, 1968), p. 386.

(End of Chapter 7)

EXECUTIVE SUMMARY OF BUSINESS PLAN

electrino energy is a new company formed to develop the inventions envisioned by the new model of physics—the electrino fusion model of elementary particles. Our company provides theoretical work and guidance to licensees. Our focus is the reverser of aging, disease, and decay processes (Refresher 1) and whatever else we must do to fund the Refresher 1.

electrino energy was formed October 12, 2005 as an invention development and theorist service specializing in four high-technology inventions – inertia-less craft; artificial gravities; reverser of aging, disease, and decay processes; and electrino fusion reactors generating electricity. All four inventions have potentially extremely high value. But all four inventions currently have three principle difficulties: 1) they are unbelievable by almost all persons – including agency heads, venture capitalists, congressmen and senators; 2) almost all of them cost scores of millions of dollars to develop; and 3) **electrino energy** has no money to develop them. With no capital and no revenue stream or other assets to fall back on, **electrino energy** cannot even get a guaranteed loan.

But **electrino energy** is not resource-less and in a hopeless condition. It has three principal approaches that it can take to resolve this dilemma:

1) Though the aging reverser is the most urgently needed, a miniature inertia-less craft can be constructed for a whole lot less money. It should be possible to construct one for a few hundred dollars borrowed from friends. But that technology could be licensed for hundreds of millions of dollars – enough to finance all the four high-tech inventions.

2) As a back-up to that approach, venture capital angels could be approached to advance the money to finance the reverser of aging, disease, and decay processes. This invention is not only high tech, but medical. The other inventions could be developed at a later time.

3) As a back-up to that approach, the owner could pursue his particle theory, predicting the masses of particles. That may be difficult, but not impossible. This would do what no other physical theory can do. Such a feat would be publishable, arousing interest among scientists for creating a facility to test the model – opening the way for government funding of the high-tech inventions.

A master decision tree flow chart linking and employing these three alternatives for funding the development of the inventions is in Section 7.0 Financial Plan.

According to alternative 1), projected sales and profits for the first four years of operation are summarized below:

Year	Sales($)	Profits($)	Profit/Sales(%)
1	200,000,000	0	0
2	0	0	0
3	0	0	0
4	10,000,000,000	9,000,000,000	90.0

According to alternative 2), there are no actual projected sales and profits for the first three years of operation. Year four is the same as above. According to alternative 3), there are no projected sales or profits for the first five years.

Currently, there are no competitors for any of these inventions. Once public incredulity is overcome by demonstration, the devices should have huge market potential.

The size of the electricity generating market is essentially enormous. It would be up to 50 percent of electric generation world-wide eventually. That's probably over a trillion dollars.

A self-powered high-speed locomotive powered by an electrino fusion power reactor would need to be at least 85 feet long.

Environmental Heat Engines

Las Vegas inventor Robert Stewart developed his "Stewart Cycle" engine for transportation vehicles, electricity generators, and large-scale water lifters. His efficient and pollution-free engine uses ambient heat to expand a working fluid such as Freon or ammonia and move pistons through sealed chambers. His patent is for Vapor Actuated Power Generating Device, No. 4,033,136.

A possibly more up-to-date version is Ralph J. Lagow's Method of Generating Power from a Vapor, Patent No. 4,693,087. Ken Rauen's Rauen cycle and Superclassical cycle engines also expand working fluids with environmental heat to provide useful net mechanical power.

Mr. Stewart claimed that his fuel-less engine could lift Colorado River water from below Hoover Dam back up into Lake Mead, thereby doubling Hoover Dam's output of electricity. He also proposed lifting water from the Columbia River into the Colorado River via a canal, generating electricity as the water flowed back downhill.

Thank you for your comment, Gary Vesperman.

The comment tracking number that has been assigned to your comment is SEDDsupp20013.

Comment Date: December 1, 2011 21:28:28PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20013

First Name: Gary
Middle Initial:
Last Name: Vesperman
Organization:
Address: 588 Lake Huron Lane
Address 2:
Address 3:
City: Boulder City
State: NV
Zip: 890051018
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Locomotive_Power_Sources.docx

Comment Submitted:

Attached is my compilation of candidate power sources for high-speed rail locomotives. It is available in my website www.padrak.com/vesperman. Page 9 has this:

Thin-Film Electrolytic Cells

A number of seasoned technology integrators have developed thin-film energy storage technologies which hold considerable promise. Dr. George Miley, Dr. Robert Hockaday and others have developed thin film technologies with energy densities exceeding 250-400 watt hours per kilogram. Dr. Miley's invention is illustrative. Using a flowing pack-bed type electrolytic cell with 1-molar LiSO4 in light water, 1mm plastic beads with a very thin [500-1,000 angstrom] film of metal [nickel, palladium, titanium] are employed. A special sputtering technique is used to spray the metals onto the surface of the beads. With 2-3 volts of electrical power and 1.5 milliamperes of current, the single film experiments have shown the material to produce more than 10 times as much output power as input. The input power is no more than 0.01 watts while .5 watt of heat is produced.

It is likely that the physics involved in this reaction involve the release of energy as a by-product of nuclear transmutation. Dr. Miley has written, "The key finding from these studies has been the observation of a large array of "new" elements (i.e., different from the original bead coating), many with significant deviations from natural isotopic compositions, after the run.

Great care has been made to ensure that these elements are distinguished from isotopic impurities by use of a "clean cell" with high purity components and electrolytes, in addition to the pre-and post-run analyses. Even low-energy radiation was detected from the bead days after each experiment. Applications to space power, providing a 1-kilowatt cell with only 500 cubic centimeters of active electrode is predicted." Note that this particular invention, with its large over-unity energy yield, was awarded an NERI grant by the DOE. At the insistent urging of the American Physical Society and representatives from MIT and other universities whose laboratories are currently engaged in high-temperature gas-cooled nuclear reactor research, Secretary Richardson eventually withdrew the grant.

The tangle-footed Department of Energy actively discourages the development of new sources of energy, presumably to appease the oil, uranium and coal companies. The U.S. Patent Office has unfairly classified secret nearly 5000 energy patents. Luckless energy inventors then risk 20 years in prison if they work on, sell, or publicize their energy invention – often created at great personal sacrifice.

(End of excerpt)

This Draft Solar PEIS should compare the cost-effectiveness of an all-out World War II Manhattan Project-styled crash program to develop and commercialize thin-film electrolytic cells with the cost-effectiveness of covering and ruining millions of acres of pristine wild lands with relatively inefficient solar energy collectors and transmission lines.

Locomotive Power Sources

High-speed trains typically rely on some means of supplying energy to the locomotive from an external source. For example, cumbersome overhead electric lines are tapped to directly power a locomotive's electric drive wheels. Another method of connecting the locomotive to an electricity grid is with a dangerously exposed high-voltage third electrified rail. Linear magnetic propulsion mechanisms have been researched.

It would be much cheaper and easier to build and operate high-speed trains if their locomotives utilize an internal practically fuel-less power source.

The following candidate high-speed locomotive power sources appear worthy of further research. Some may be found to be worthwhile for building and testing prototype self-powered locomotives.

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BlackLight Power's Hydrino Generator

BlackLight Power, Inc., is developing an exotic new source of clean energy from ordinary water. Either an electrolytic cell or gaseous potassium ions in a vacuum compress hydrogen atoms into lower-energy-state hydrogen atoms called "hydrinos". When the hydrinos are formed, energy is released which in magnitude is between chemical and nuclear energy. BlackLight Power, Inc., has ambitious plans for retrofitting fossil-fueled and nuclear power plants.

BlackLight Power, Inc., is developing a 100-kilowatt generator which can power a car 100,000 miles on a tank of water. BlackLight Power, Inc., claimed some years ago that it is developing a 10-kilogram battery which can supply 150 horsepower for 1,000 miles.

BlackLight Power, Inc., has already licensed 8,250 megawatts of clean, safe hydrino generation fueled by water to seven utilities (Hoover Dam's nameplate capacity is 2,080 megawatts) – eliminating $2 billion/year in fuel costs.

Focus Fusion

See http://www.focusfusion.org/. Apparently this method is much less expensive than hot fusion.

Thorium PowerPack

Bob Dratch's thorium powerpack would generate electricity at approximately one-tenth of the cost of current methods of producing electricity. Thorium is sufficiently abundant that the entire planet can be powered for millennia. After ten years of continuous operation, a trace amount of U-233 is produced. U-233 recovery to re-purify the thorium is easily accomplished. Thorium thus lasts a long time when recycled and consequently is a very efficient energy source. After extraction from ore, thorium does not require energy-intensive enrichment as is the case with uranium.

A thorium-powered reactor is inherently safe. It doesn't run the risk of "meltdown" or explosion nor can even a dirty bomb be created. Its nuclear reaction simply stops when its neutron exciter is turned off.

The simplest and smallest "table top-sized " neutron exciter design is something close to the size of a 4-D cell flashlight, and starts at about 500-kilovolt neutron output. In fact this smallest most cost-effective system can run off 4 D cells for its power.

A thorium powerpack's neutron excitor does not use radioactive flux components as conventionally done for portable systems. Instead it relies on Dratch's invention of a novel method of resonant phonon pair cleavage using specifically designed nuclear lattice holo-forms (holographic waveforms) to induce neutron imbalance in a host atom where the host atom then attempts to establish "balance" through the liberation of neutrons. Dratch demonstrated the first model of this novel design back in 1966.

Commercial thorium powerpacks can be developed with 50 or 100 kilowatts of output for home use, and up to 1 megawatt for industrial use. They actually are "power amplifiers" with power outputs of 60 times over input power. Maintenance would be minimal.

IPMS Thorium-227 Electricity Generator

The I.N. Frantsevich Institute for Problems of Materials Science (IPMS), Kiev, Ukraine, from 1951 through 1991 secretly employed 6600 of the most brilliant theoretical physicists in the entire Soviet Union to work for nearly 50 years with complete freedom. They were able to develop whole new sciences, technologies and materials unknown in the West.

Their models of non-linear quantum mechanics, plasma physics, atomic engineering, nuclear physics and related mathematical and theoretical constructs, which made their development possible, are so unique that they challenge the validity of the most fundamental assumptions embodied in the Copenhagen Interpretation model currently held in general acceptance in the West.

For example, Western-developed particle/wave quantum mechanics is described by Einstein's $E = MC^2$. The Soviet nonlinear model of quantum mechanics is described by the formula $E = M_K v$ [Energy = Mass @ rest as a function of a mathematical constant].

Einstein's theory of relativity assumes that the speed of light is constant. However, measurements have shown that the speed of light has slowed down 7 per cent over the past two centuries. (See http://worldnetdaily.com/news/article.asp?ARTICLE ID=39733.) Einstein's famous equation is therefore not based on the real world of peer-reviewed experimental results. Consequently the more correct Soviet model has enabled numerous technical advances not even dreamed of by Western science.

Among several energy inventions developed by the IPMS are free-standing thorium-227 isotope electric power generating plants. They can be small enough to power a single home and large enough to power whole communities. They also can operate for up to 18 years without ever requiring refueling or maintenance.

Micro-Fusion Reactor Employing Stable High-Density Plasma Electron Spiral Toroids In Neutron Tube

Electron Power Systems, Inc., (EPS) has discovered the explanation for ball lightning and from that has invented and protected with five patents an Electron Spiral Toroid Spheromak micro-fusion reactor. Safe, pollution-free micro-fusion reactor-powered generators could reliably generate electricity with capacities ranging from 10 kilowatts through 1000 megawatts at the cost of 10% of today's electricity. All transportation vehicles could be reliably and safely powered with micro-fusion reactors with substantially lower production, operating and maintenance costs and without poisonous emissions. EPS expects to reduce the mass and cost of aircraft by 70%, and space launch costs by more than 95%.

Each year 15 million cars and trucks are sold in the USA, and 48 million are sold worldwide. EPS expects to eventually replace all of them with silent, reliable, safe, emissions-free micro-fusion reactor powered electric vehicles with substantially lower production, operating, and maintenance costs.

In addition, EPS has designed a 10kW generator that will operate on clean, non-polluting fuel, and can operate locally. This innovation will potentially improve the lives of most of humanity by making available low cost electricity that anyone can produce in their own homes. It will help literally billions of people. The paper design shows that the EPS generator will be the approximate

size and cost of a 10 kW generator available today in any hardware store, with the advantage that it will not use fossil fuels, but will use clean energy instead.

An article in the Institute of Electrical and Electronic Engineers, Inc., Spectrum magazine over ten years ago stated that world demand for electricity increases approximately 500 megawatts every day. To put this in perspective, the equivalent of another Hoover Dam would have to be built every four days to keep up with world electricity increase demands. The EPS innovation will make local generation possible without the need for more power plants or more power lines.

Major contributors to air and water pollution are the fossil-fueled engines of aircraft, farm harvesters and tractors, ships, boats, snowmobiles, trains, military vehicles, and all-terrain vehicles. Their engines could be replaced with cheaper electric motors and batteries charged by safe, non-polluting onboard micro-fusion reactor powered generators.

Electron Power Systems, Inc., (EPS) is an early stage company working to develop the Electron Spiral Toroid Spheromak micro-fusion reactor. From EPS will come new applications, including a practical micro-fusion electricity generator, a low-cost space launch vehicle, a high-kinetic energy anti-missile beam, and practical zero-emission cars, trucks, buses, farm equipment, construction equipment, military vehicles, and jet aircraft.

EPS is moving to commercialize these concepts. EPS has assembled a team of engineers, and plasma physicists, all as contractors. EPS is working on proof of concept demonstrations for the applications.

EPS plans to build a laboratory demonstration unit in two to three years with present funding levels, and then the first commercial prototype. Recent breakthroughs in the EPS lab give confidence this will happen within this timeframe. More funding will make this happen sooner.

EPS is seeking $2 million as a first round of investment to complete the development of a demonstration unit in eighteen months. A second investment of $8 million will be needed to complete a prototype unit in eighteen months after the demonstration unit.

Up until now EPS has had no sales and operates with funding from angel investors, each of whom is retired and has accumulated a substantial personal fortune, allowing these types of investments of high risk, high reward. EPS also operates with funding from the founder.

EPS operates on a low budget, spends only what it has, and has incurred no debt or obligations. In this manner it is able to operate indefinitely, while continuing to make progress each year. Additional small amounts of funding will speed developments.

EPS has made a new discovery in physics with the potential to locally produce low-cost, clean energy for homes and buildings, independent of power plants. EPS owns the new technology and plans to initially produce a safe, clean, 10-kilowatt electricity generator that needs no nuclear fuels nor fossil fuels and will produce no green house gases. A home owner would need a one-liter sized container of environmentally benign hydrogen/boron fuel per year at a 20:1 fuel cost savings compared to commercially produced electricity or fossil fuels.

EPS's new discovery would allow anyone worldwide to buy a small home generator, about the size but less than the cost of a Sears 10-kilowatt portable generator. It would power their home plus

several nearby homes even where there are no power grids or power plants. This will be a step towards providing low-cost, local electricity to help eliminate poverty worldwide.

EPS plans to build 10-kilowatt generators by applying its newly discovered technology to improve work done by others to create energy. The basic work was shown successfully in the 1980s at the University of Miami. But that technology had limitations at that time. EPS's new technology will overcome those limitations.

From a modest start with producing 10-kilowatt micro-fusion reactor powered generators, EPS expects to branch out to other applications of its technology as well as producing larger and larger generators.

Mankind's practically insatiable demand for energy implies a simply humongous market potential for EPS which would encompass all of the world's producers of oil, coal, uranium and electricity plus all manufacturers of transportation vehicles including cars, trucks, buses, farm equipment, ships, boats, construction equipment, trains, satellites, aircraft, snowmobiles, and military vehicles.

Several thousand neutron tubes are in use in the USA today that safely collide hydrogen ions to produce neutrons, which in turn are used for medical testing, industrial process control, and homeland security. An ion source produces hydrogen ions (deuterium), which are accelerated to 110 kilovolts, then directed to hit a hydrogen target (also deuterium), which produces neutrons, and also heat as a waste product. Neutron tubes today produce neutrons and a low level of heat energy. The low density of the hydrogen ions limits the amount of energy produced.

In the 1970's, Dr. Wells at the University of Miami collided two plasma toroids to produce low-level fusion energy in the TRISOPS system. The amount of energy produced was limited by the short duration time of the plasma toroids used, as well as their low density and their low level of energy.

Electron Power Systems, Inc., (www.electronpowersystems.com) has discovered a plasma electron spiral toroid that remains stable without magnetic confinement, by using background gas pressure for confinement instead. These new plasma toroids are observed to remain stable for thousands of times longer than classical plasma toroids, which opens the way for new clean energy applications.

EPS's new stable plasma electron spiral toroids overcomes each of the neutron tubes limitations, and will potentially result in fusion with no magnetic containment required – thus producing a practical micro-fusion reactor. EPS's challenge is to adapt the new stable plasma toroid to the TRISOPS method.

The micro-fusion reactor adapts the Electron Spiral Toroid (EST) Spheromak to the neutron tube design. The EST Spheromak is patented jointly with MIT scientists who also have published papers confirming the EST Spheromak physics and data. The EST Spheromak will overcome the neutron tube limitations by increasing ion density by 2500 times. A metal containment can be used for efficient heat energy collection and conversion.

The EST Spheromak micro-fusion reactor will be less than three feet in length, the same as for present neutron tubes, and small enough to fit in an electric car. Elimination of the need for magnetic containment allows this power supply to be small and compact. A micro-fusion reactor will use hydrogen/boron to produce clean energy without neutrons. The energy in one pound of

hydrogen/boron fuel equals the energy of 250,000 pounds of gasoline. Hydrogen and boron are plentiful and will not run out, as oil is projected to do in the 21st century.

The Electron Spiral Toroid Spheromak (ESTS) is a plasma toroid that is self-organized and self-stable with no magnetic fields needed to contain it. Inventor Clint Seward has not seen any published descriptons of any devices nor phenomena similar to the ESTS. The US Patent Office agrees and has issued five patents.

The micro-fusion reactor was recently selected by the New Energy Congress as one of the few technologies now known to have a genuine potential to replace fossil fuels. See the lengthy analysis of the micro-fusion reactor in http://pesn.com/2006/03/08/9600242_Spheromak_Plasma_Toroid/.

"Locomotive Power Sources" for high-speed rail in www.padrak.com/vesperman includes the micro-fusion reactor with BlackLight Power's hydrino generator, focus fusion, Robert Dratch's thorium powerpack, Kiev, Ukraine's I.N. Frantsevich Institute of Problems of Materials Sciences (IPMS) thorium-227 electricity generator, Clem over-unity vegetable oil engine, thin-film electrolytic cells, noble gas plasma engine, Searl effect generator, Magnatron - light-activated cold fusion magnetic motor, Oleg Gritsevich's hydro-magnetic dynamo, IPMS energy storage/battery device, metamatter which is solid crystallized fully-ionized plasma, Gordon Ziegler's electrino fusion power reactor, and environmental heat engines.

Some of these listed new energy inventions appear to have at least one limitation that is not shared with the ESTS micro-fusion reactor.

The Electron Spiral Toroid Spheromak (ESTS) micro-fusion reactor has five patents and is documented in published papers confirming the physics and data. (1), (2), (3), (4)

Clint Seward discovered the ESTS (5) while studying ball lightning. Seward has developed a secret formula to produce the ESTS that is not reported in any other reference to date that he has seen.

Why this is important is that all spheromaks reported to date dissipate in microseconds, while the ESTS has been observed to endure with no confining magnetic field for hundreds of milliseconds, and theoretically will remain stable for many seconds.

1. Seward, C., Chen, C., Ware, K., Ball Lightning Explained as a Stable Plasma Toroid. PPPS-2001 Pulsed Power Plasma Science Conference, June 2001.

2. D. C. Seward, C. Chen, R. Temkin, Energy Storage Device, US Patent 6,140,752, Oct. 31, 2000.

3. C. Chen, R. Pakter, and D.C. Seward, Equilibrium and Stability Properties of Self-Organized Electron Spiral Toroids, Physics of Plasmas. Vol. 8, No. 10. Oct. 2001.

4. W. J. Guss, Chen, C., Equilibrium of Self-Organized Electron Spiral Toroids. Physics of Plasmas. August 2002.

5. Seward, C., Ball Lightning Explanation, Leading to Clean Energy. Acton, MA 01720. Seward Publishing Co., 2011.

EPS plans to initially produce a safe, clean, 10-kilowatt electricity generator that needs no nuclear fuels nor fossil fuels and will produce no green house gases. A home owner would need a one-liter sized container of environmentally benign hydrogen/boron fuel per year at a 20:1 fuel cost savings compared to commercially produced electricity or fossil fuels.

But first EPS needs to obtain $2 million as a first round of investment to complete the development of a demonstration unit in eighteen months. A second investment of $8 million will then be needed to complete a prototype unit in eighteen months after the demonstration unit.

EPS's new discovery would allow anyone worldwide to buy a small home generator, about the size but less than the cost of a Sears 10-kilowatt portable generator. It would power their home plus several nearby homes even where there are no power grids or power plants. This will be a step towards providing low-cost, local electricity to help eliminate poverty worldwide.

From a modest start producing clean, reliable, safe 10-kilowatt micro-fusion reactor powered generators, EPS plans to methodically produce larger and larger generators. EPS even has a preliminary design with supporting calculations for massive 1000-megawatt baseload generators.

Mankind's demand for energy implies an enormous market for micro-fusion reactors encompassing all of the world's producers of oil, coal, uranium and electricity plus all manufacturers of transportation vehicles including cars, trucks, buses, farm equipment, ships, boats, trains, satellites, aircraft, mining equipment, snowmobiles, construction equipment, and military vehicles.

Countries which export oil will benefit from not having to quickly burn up their finite oil reserves on cheap gasoline and diesel fuel. Instead they will be able to draw down their reserves more slowly by making products of higher value such as plastics, medicines, fertilizers and synthetic textiles.

Some years ago a Forbes article stated that PECO (formerly Philadelphia Electric Company), with an income stream to back it up, was able to sell on Wall Street $4 billion worth of bonds paying 5.8 per cent. A micro-fusion reactor powered generator manufacturer could simply sell bonds to build and operate generators at a low interest rate. Generator loan payback times may be in the ball park of a half-year to a year, depending on the local electricity market price. As soon as a micro-fusion powered generator is paid for, the revenue from that time on would be almost pure profit. Once a track record is established by successfully installing a few micro-fusion reactor powered generators, Electron Power Systems, Inc., could raise money to build and install more generators by simply selling billions of dollars of bonds instead of stock. So therefore, there wouldn't be any dilution of ownership.

EPS plans to partner with major electricity producers and suppliers. EPS will license them to produce electricity as they do now. EPS plans to partner with automobile manufacturers to license the technology. EPS plans to partner with defense and aerospace contractors to license the technology.

MANAGEMENT

Clint Seward is the discoverer of the Electron Spiral Toroid Spheromak and received the initial patents. He has been working ever since to scale up the results, which he has been able to do recently. He has been a project design engineer and program manager for many years, working initially with the US Air Force B-58 Hustler program, and as a project manager and engineering

manager in several major corporations. His work was defense initially, moving to security and process control, then energy related.

Clint was an Engineering Manager for Mosler, an American Standard Division 1970 thru 1978, and an Engineering Manager and VP of Marketing for Bristol-Babcock 1978-1985 – an ACCO fortune 500 Company. He was General Manager of Iontrack, a Division of a large international company 1985-1989 (now a Division of GE). He has been President of his own company Electron Power Systems, Inc. from 1989 to present.

Education: MSEE; University of Michigan 1965; BS at US Military Academy at West Point 1963.

D C Seward is the VP Engineering of Electron Power Systems, Inc. He has worked on the micro-fusion reactor technology since its inception in 1986. He has the responsibility for organizing the experiments and bringing qualified people in to help with the work. DC has worked as the VP Engineering of EPS on a contract basis from 1998-Present as funding allows. He is employed full time as a Field Sales engineer for Ember Systems, a wireless technology company, 2005-Present. Previously he was a Product Design Engineer, Trimble Navigation: 1994-1998

Education: MSEE Massachusetts Institute of Technology, 1994.

Jim Becker is acting CEO and Marketing VP. Jim has experience as a senior executive in the high tech sector with extensive experience managing rapid growth organizations. He has a broad technology background with proven skills in computer systems, avionics industries, and health care information technology along with direct functional experience in finance, sales, marketing, engineering and corporate management in both domestic and international settings.

Education: Thayer School of Engineering, Dartmouth College; Master of Engineering 1976; Master of Business Administration 1975; Bachelor of Engineering 1970.

PAPERS AND PATENTS for Clint Seward:

Chen, C., Pakter, R., Seward, D. C. "Equilibrium and Stability Properties of Self-Organized Electron Spiral Toroids." Physics of Plasmas. Vol. 8, No. 10. October 2001.

Seward, C., Chen, C., Ware, K. "Ball Lightning Explained as a Stable Plasma Toroid." PPPS-2001 Pulsed Power Plasma Science Conference. June 2001.

Seward, C. "Propulsion Using a Stable Plasma Thruster." STAIF 2001, (Space Technology and Applications International Forum-2001). American Institute of Physics , www.aip.org/catalog/conforder.html. February 15, 2001.

Seward, C.; Chen, C., Temkin, R. ENERGY STORAGE DEVICE , US Patent 6,140,752, October 31, 2000.

Seward, D. C. Electron Spiral Toroid; US Patent 5,773,919; June 30, 1998.

Seward, D. C. Energy Storage System, US Patent No. 5,589,727. December 31, 1996.

Seward, D. C., Chen, C., Temkin, R. (1996b). International Patent Application WO 96/38848, Energy Storage Device, Published December 5, 1996.

Seward, D. C. Fixed Geometry Plasma and Generator, US Patent 5,175,466. Dec. 29, 1992.

ESP's President Clint Seward collaborated with Gary Vesperman in writing a description of Seward's invention in www.padrak.com/vesperman. See "Locomotive Power Sources".

The Products page of www.electronpowersystems.com sells a book "Ball Lightning: Leading to Clean Energy" and a paper "Spheromaks Observed Forming in Atmosphere". Paper's abstract:

Plasma toroids, called spheromaks, are reported here as observed forming in partial atmosphere from high power electric arc events similar in power to lightning ground strokes. The spheromaks are observed to be stable in partial atmosphere with no confining magnetic fields and are observed to last for more than 200 milliseconds in partial atmosphere. This paper describes the observations and presents a model that explains the properties of these spheromaks, which we call Electron Spiral Toroid Spheromaks (ESTS's) due to the spiraling motion of the charged particles. It includes four TV images. The model presented is a hollow toroid with a thin outer shell of electrons that all travel in parallel paths orthogonal to the toroid circumference, in effect spiraling around the toroid. A comparable inner surface of ions acts to neutralize the space charge. The paper provides formulas describing the ESTS. Potential ESTS applications include X-ray production, air defense, and energy production.

The cost to produce a 10-kilowatt EST Spheromak electricity generator would be about $1100 in production quantities. The EST Spheromak generator would have fewer parts than a comparable Sears generator.

Electron Power Systems, Inc., does not have a working prototype. The company has identified the instrumentation and needs another $100,000 for laboratory work. With $2,000,000, the company expects to have in two years a demonstrable prototype. In an additional year for $8,000,000 a production prototype is expected to be built. Remember, each piece of the project uses technology others have demonstrated.

Clem Over-Unity Vegetable Oil Engine

Richard Clem was a heavy equipment operator who had noticed that a hot asphalt sprayer would continue to run for up to an hour even after the power was turned off! So he built a modified version as a 200-pound engine which ran on vegetable oil at 300 degrees and was started by a 12-volt battery. The heat is internally generated by the engine. During a nine-day test conducted by Bendix Corporation engineers, the engine in its self-running mode consistently generated 350 horsepower into a dynamometer. The engine is constructed from off-the-shelf components except for a hollow shaft and a custom cone with enclosed spiral channels.

If the automobile industry adopts the Clem over-unity engine, motorists could change its eight gallons of vegetable oil only every 150,000 miles and never buy any gasoline. To illustrate the engine's durability, the only working model of the Clem engine has been continually running on his son's farm for several years.

Combining the Clem over-unity engine with the hydrosonic pump could provide distilled ocean water as well as hot water for space heating, kitchens, and bathrooms at *no* energy cost.

The Clem over-unity vegetable-oil engine is not patented. It may be fairly straightforward to set up a small machine shop for manufacturing hollow shafts and cones.

Thin-Film Electrolytic Cells

A number of seasoned technology integrators have developed thin-film energy storage technologies which hold considerable promise. Dr. George Miley, Dr. Robert Hockaday and others have developed thin film technologies with energy densities exceeding 250-400 watt hours per kilogram. Dr. Miley's invention is illustrative. Using a flowing pack-bed type electrolytic cell with 1-molar $LiSO_4$ in light water, 1mm plastic beads with a very thin [500-1,000 angstrom] film of metal [nickel, palladium, titanium] are employed. A special sputtering technique is used to spray the metals onto the surface of the beads. With 2-3 volts of electrical power and 1.5 milliamperes of current, the single film experiments have shown the material to produce more than 10 times as much output power as input. The input power is no more than 0.01 watts while .5 watt of heat is produced.

It is likely that the physics involved in this reaction involve the release of energy as a by-product of nuclear transmutation. Dr. Miley has written, "The key finding from these studies has been the observation of a large array of "new" elements (i.e., different from the original bead coating), many with significant deviations from natural isotopic compositions, after the run.

Great care has been made to ensure that these elements are distinguished from isotopic impurities by use of a "clean cell" with high purity components and electrolytes, in addition to the pre-and post-run analyses. Even low-energy radiation was detected from the bead days after each experiment. Applications to space power, providing a 1-kilowatt cell with only 500 cubic centimeters of active electrode is predicted." Note that this particular invention, with its large over-unity energy yield, was awarded a NERI grant by the DOE. At the insistent urging of the American Physical Society and representatives from MIT and other universities whose laboratories are currently engaged in high-temperature gas-cooled nuclear reactor research, Secretary Richardson eventually withdrew the grant. The tangle-footed Department of Energy actively discourages the development of new sources of energy, presumably to appease the oil, uranium and coal companies. The U.S. Patent Office has unfairly classified secret nearly 5000 energy patents. Luckless energy inventors then risk 20 years in prison if they work on, sell, or publicize their energy invention – often created at great personal sacrifice.

Searl Effect Generator

The Searl effect generator (SEG) can be used to charge the batteries in a self-powered electric vehicle. A solid-state device, the heart of an SEG is a series of three concentric magnetic rings with magnetic rollers going around the rings. Both the rollers and rings are comprised of four layers of titanium, iron, nylon, and neodymium.

The magnetic fields impressed on the rollers have both AC and DC components. The AC component is for floating the rollers so they don't touch the rings. The DC component is to prevent them from flying off. The innermost set contains a minimum of 12 rollers for the same reason that a linear motor will not operate with less than 12 phases.

The inner set of rollers travel around at 250 miles per hour, the middle set travels at approximately 600 miles per hour, and the outer set at approximately 1500 miles per hour. Hundreds of millions of volts are generated the energy of which is picked up by brushes positioned all around the outside set of rollers.

An SEG also creates an anti-gravity field. An uncontrolled SEG will rise about 50 feet as the rollers increase speed, emit a light blue halo which indicates energy is being extracted from the ether, and then shoot up into the sky gaining speed, never to be seen again. At least one roof has been holed by an SEG. The friction-less rollers can be prevented from reaching the critical velocity that produces lift by use of a “governor”, either mechanical or electronic.

An SEG can be easily controlled by immersing it in an electromagnetic wave field the frequency of which is a harmonic of the SEG’s primary frequency. While in resonance, the magnetic poles of the rollers reach a unification state, and they stop moving.

The inventor has built and flown a small “inverse gravity” vehicle. A flying saucer-like SEG-powered aircraft about the size of a bus is currently being built in England by a private group.

The inventor for some years independently powered his house off the power grid with a home-sized electrical generator version of the SEG. A householder could set up a 45 x 45-cm unit and generate an output of 11 kilowatts of free electrical power.

Oddly, a house powered by an SEG has been observed to have greater healing powers than conventionally electric powered houses. The healing effect is claimed to be due to the electrons zapping the occupants, taking away pain and returning blood more quickly to damaged tissue. The SEG would also help combat asthma, bronchitis, hay fever and lung complaints due to the increased supply of oxygen in the body. Conventional methods of electric power do not pump out electrons which results in tired eyes and a tired brain.

The SEG's negative charge also means that dust stays in the carpet instead of floating in the air. This is similar in action to negative ion generators sometimes sold as air fresheners.

Two Russian scientists replicated the Searl effect generator and vindicated all of these somewhat unusual claims. See their paper “Experimental Research of the Magnetic-Gravity Effects”, V. V. Roschin and S. M. Godin, Institute for High Temperatures, Russian Academy of Science, Izhorskaya 13/19, Moscow 127412, Russia.

At one time, a German power company reportedly considered replacing a nuclear power station with eight fuel-less SEGs costing a total of about $4.5 million and generating a total of 240 megawatts with no pollution.

Noble Gas Plasma Engine

Joseph Papp was granted US Patent #3,670,494 for his “Noble Gas Plasma Engine”. A mixture of recycled inert gases (helium, neon, argon, krypton, and xenon) is exposed to a high-voltage discharge in a sealed cylinder with a piston. The spark causes the gases to expand violently though no combustion occurs. Mechanical energy is delivered by the piston's displacement. The gases immediately collapse to their original density, and the cycle is repeated. After several thousand hours the gases lose their elasticity and are replaced. The operating cost is 15 cents an hour.

The first prototype was a simple 90-horsepower Volvo engine with upper end modifications. Attaching the Volvo pistons to pistons fitting the sealed cylinders, the engine worked perfectly with an output of three hundred horsepower. The inventor claimed it would cost about twenty five dollars to charge each cylinder every sixty thousand miles.

There were indications that such an engine could provide its own electrical power and being a closed system, require no fuel. It is not by definition an electromagnetic engine, however. It is believed that at the heart of the Papp engine is the development of high-density electrical charge clusters which provide the energy to expand the gases.

Other patents are 5319336, 4151431, 3670494, 4046167 - Mechanical Accumulator, 3680431 - Method and Means for Generating Explosive Forces, and 4,428,193 - Inert Gas Fuel, Fuel Preparation Apparatus and System for Extracting Useful Work from the Fuel.

Magnatron – Light-Activated Cold Fusion Magnetic Motor

During the late 1970's Howard Rory Johnson, a brilliant inventor in Elgin, Illinois, combined light-activated cold fusion with a new type of magnetic motor into a "Magnatron". His prototype Magnatron produced 525 horsepower but only weighed 475 pounds. It could propel a large truck or bus 100,000 miles on about 17 ounces of deuterium and 1.5 ounces of gallium before being recharged. This was years before either Pons and Fleischman or Dr. James Patterson entered the scene with their cold-fusion technology.

Johnson discovered the light-activated cold fusion portion of the Magnatron by accident when as he was developing a new type of electronic circuit using deuterium oxide and gallium, he noticed the two materials were producing energy on their own. He could not figure out what was triggering the energy production for some time until he finally discovered it was light.

The Magnatron's flow of deuterium (an isotope of hydrogen) is controlled by magnetic tunnels. At the point where the deuterium strikes the gallium (a heavy metal electron donor), a beam of light from a diffraction prism forces their fusion. That controlled reaction results in the fusion of two atoms forming a new atom. In the process, electricity is released, and that is what powers the magnetic motor. The Magnatron is sealed, however, so 'light' is provided from photon energy produced from coils tied directly to the motor. It is more or less a pulse-generated system.

A photon is a football-shaped particle of electromagnetic wave energy. Its energy content is a product of its frequency f and Planck's constant h. When an electron in orbit around the nucleus of an atom drops to a lower, less energetic orbit, a photon containing the energy equivalent to the electron's energy drop is emitted. This explains why light and other forms of electromagnetic energy such as gamma rays and radar are sometimes observed as particles and other times as waves. The heated filament of a light bulb is an example of photon production.
There is no way to explain, using contemporary electrical theory, how his relatively small motor could produce such tremendous horsepower. Utilizing his own new electrical-magnetic energy theory, involving a process he called "attract-attract", Johnson exploited the magnetic field. He used the top and bottom rotors in his motor. First, the top rotor attracted, released; then the bottom rotor attracted, released. The action of attraction, alternating between upper and lower magnets, used the windings to complete the attract field.

Robert Nelson's compilation of articles about the Magnatron provides much more technical detail on the Magnatron than the foregoing. (See http://www.rexresearch.com/magntron/magntron.htm.)

Johnson constructed his prototype Magnatron's 525-horsepower magnetic motor without any of the hardware that is presently used in present state-of-the-art electric motors. Conventional motors use the accepted principle of attract-repel, an energy form that doesn't utilize the magnetic field to its greatest advantage. For comparison, a typical 500-horsepower electric motor has wires exiting it that are the size of a garden hose.

The sealed self-contained Magnatron has no wires. Thus, other than the Magnatron's infrequent refueling with small amounts of deuterium and gallium, the stand-alone Magnatron uses no input power. The Magnatron's entire output power is conveyed by its magnetic motor's rotating shaft.

Fuel for the Magnatron is plentiful: deuterium is derived from water, and gallium is extracted from abundant aluminum bauxite. Commercially available pure gallium is still scarce and expensive. It may well be possible, however, to cheaply transmute another less expensive element into gallium. See Gary Vesperman's list of over two dozen methods of neutralizing radioactive waste in http://freeenergynews.com/Directory/NuclearRemediation/Vesperman/ which includes possible transmutation methods. Additional methods are briefly described in http://freeenergynews.com/Directory/NuclearRemediation/. Dr. Santilli's method plus an explanation of suppression of radioactivity neutralization methods are available at http://www.nuclearwasterecycling.com/. Robert A. Nelson's survey "Transmutations of Nuclear Waste" is at http://www.rexresearch.com/articles/nukewa.htm.

The Magnatron uses no fossil fuel in its operation, and it emits no pollution. The magnetic motor's RPM is 8,000 with a gear ratio of 2:1. Lubrication for the sealed motor is synthetic motor oil which does not need changing and does not need a filter, because foreign materials such as carbon and varnish are not introduced into the system, as they are in the internal combustion piston engine.

This writer, Gary Vesperman, attended the 3rd International Symposium on New Energy in Denver, CO (April 25-28, 1996). I remember being impressed by Gerald Orlowski"s lecture "Magnatron, Fusion Magnetic Motor", during which he provided substantial technical information on the Magnatron.

Orlowski reported that, "Some inside information revealed that OPEC had been keeping track of all competitive technology", and Johnson was #1 on their hit list! Johnson was about to manufacture the motors through a nationwide dealership. Some motors still exist, but the owner wants several million dollars for them."

This writer Gary Vesperman knows of very few inventions of new energy sources which are reasonably large stand-alone energy producers. Besides the Magnatron, they include Oleg Gritskevitch's hydromagnetic dynamo, and Electron Power Systems' micro-fusion reactor, which employs stable high-density plasma electron spiral toroids. Almost all inventions of new energy sources are, or claimed to be, relatively small over-unity power converters that convert input power to greater amounts of output power. Bob Dratch's thorium powerpack is an exception (see above).

At the September 14, 2005 public meeting in Green Valley Ranch casino regarding the proposed Regional Fixed Guideway traversing Las Vegas, Nevada, this writer Gary Vesperman submitted comments suggesting possible power sources for the train, including descriptions of the hydromagnetic dynamo and the micro-fusion reactor (http://www.rtcsouthernnevada.com/rfg/documents/September2005PublicMeetingMinutes.pdf, pp. 19-77).

No wonder the Magnatron's inventor, Rory Johnson, was rumored to have been "Number One" on Organization of Petroleum Exporting Countries (OPEC)'s hit list.

The following is an excerpt, slightly edited, from Orlowski's lecture transcript where he tells about his unwitting personal involvement with the U.S. Government's suppression of the Magnatron:

"After I saw the Magnatron motor, my life changed. I was no longer a happy camper working by myself in a wonderful, fully equipped research machine shop for the Greyhound/Armour Corporation in Arizona. While on a business trip, I saw this motor running in the Magnetron, Inc.'s showroom located in Eglin, Illinois.

"During my 15 years of electric motor repair, among the hundreds of motors I repaired, I rewound a 500 HP electric motor. That motor had wires exiting it that were the size of a garden hose. The Johnson motor being shown had NO wires. Surely this motor was unreal, a con-job to get money for dealerships. Yes, there he was, Rory Johnson standing next to his sealed self-contained electric motor.

"Upon returning to the Greyhound Towers and telling them what I had seen, they instructed me to call Mr. Johnson. Greyhound wanted Johnson to put forth a plan to install a motor in one of their buses for testing purposes.

"I called Johnson. He was delighted that a Greyhound employee had seen the motor running, and replied that the testing idea was acceptable. He would set a time frame for just when a bus should be delivered to him.

"Two years went by, with no business proposal from Johnson. Then, his former business partner, Mike Marzicola, called to say Johnson had passed away. He wanted me to work with him to get one of the motors running. I flew to Orange County, CA, saw the motor, took pictures, and put forth a plan to Greyhound. Subject to a contract with Marzicola, one of the old worn motors would be brought to the research shop. I would then very carefully reconnect the generator wires that Johnson had cut off prior to moving from Elgin, IL to California.

"Discussions with Marzicola brought out that the U.S. Government (given the authority by the Congress of 1952) had issued a GRAB order to take Johnson's motors. Rumor has it, the DOE is run by US oil companies and OPEC, and they want no competition, period. Because of this grab order, Johnson had cut the generator wires. He had then put his `total shop', with motors and all, on several U-Haul trucks and left Illinois in the middle of the night. He went to California to re-establish his business. But before he could get a motor running, he passed away.

"Surely, Greyhound would agree to let me re-start one of Johnson's motors. The wonderful proposal put forth to Greyhound was rejected by mail. Very agitated, I went to the top office at Greyhound demanding an explanation. I was met at the door with the comment, "We know why you are here." Knowing the potential savings to the bus company, surely they could have only one reason for rejecting the proposal. They must have believed I was not qualified to start up the motor.

"Greyhound's top legal advisor stated he was present when the Greyhound board met and discussed my written proposal. He stated the following, "At NO time was the thought put forth that you would not succeed. In fact, we discussed all of the hardware designed and constructed by you, and started the conversation from what happens when Greyhound has a running motor. We contacted a State representative who felt this motor should not be allowed to be used in 4,000+ buses. The loss in tax

dollars for fuel alone would be a very huge sum." He then asked me to leave, stating he was sorry that he had to tell me the reason the plan was rejected.

"Telling Marzicola of the rejection, I offered to personally put in a few thousand dollars toward the parts to get one motor running. In return, I would be assigned the dealership for the Phoenix metropolitan area. We signed legal papers in exchange for the money agreed on, and went to work. (I still have the signed dealership.)

"The first thing I noticed was that someone had been working on repairing the motors. Three motors already had new commutator assemblies installed. Each assembly consisted of 3 commutator assemblies on one insulated tube with a metal case to secure it to the shaft.

"One motor still had the old worn commutator assembly, as it had not yet been repaired."

Orlowski goes on to describe his reconstruction efforts and includes interesting technical details about the Magnatron's structure and theory.

Johnson did not know that OPEC tracks all potential competition to its oil business and that he was reportedly number one on OPEC's hit list. His first mistake was publicizing, in many magazines, his plans to manufacture and distribute his revolutionary motor.

Erik Masen has spoken with a few people who even signed up for distributorships. Erik Masen had included Johnson and his Magnatron in his energy invention suppression anthology (see http://www.electrifyingtimes.com/erik masen suppression.html).

In 1979, Johnson placed his engine in a Buick Electra and was preparing to drive it around the country to sign up more distributorships when the US Department of Energy and the State of Illinois teamed up to prohibit his company Magnatron, Inc., from producing and selling Magnatrons. They first placed a gag order on all the people in the company by using the Secrecy Act of 1952.

Secondly, the State of Illinois immediately requested the company to provide information about all of their employees, distributors, stockholders, investors, suppliers, etc. They asked questions that blatantly deny anyone's constitutional rights to privacy. The pressure from the State of Illinois became so overwhelming that Johnson decided to move his entire business to California in the middle of the night.

After a year of hearing nothing but silence from Johnson, Greyhound agents tried to contact him – only to be notified that he had passed away unexpectedly. This is a particularly troubling part of the story, since he had been in his early fifties and in robust health. Later, Greyhound learned that shortly before he died, Johnson had inexplicably moved out of his laboratory in the middle of the night and taken all of his motors and technology to California.

Bob Bass, in his report copied below on low-energy nuclear transmutation, claims that the CIA, the KGB and the Mossad, etc. all have "sprays" which can be sprayed upon someone and cause him or her to die of apparently natural causes. One speculation is that Johnson's death – apparently due to heart failure – had been artificially induced by such a spray.

In a January 20, 2007 email to Gary Vesperman, Terry Sisson reports:

"Hi Gary,

"I visited Magnatron, Inc., in July 1979. I wish I would have taken a photo. Placards were placed over every inch of the large windows in the front of the building listing all of the questions the State of Illinois requested his company to provide. He wrote, "When has the government ever had the right to ask this of any company." I peeked in the front window and saw one of his motors mounted on an engine stand. Nobody appeared to be there so I walked around to the rear of the building. I found the rear garage door open and could see the Buick Electra inside. I was about to approach nearer when a man emerged. We talked, but he quickly informed me that due to a US gag order he was unable to talk about anything. I managed to get his phone number and called him from time to time for years following. He was an assistant of Rory's and he kept the information very close to the vest. He did tell me that it was real and it worked, yet not how it worked.

"About 1984, I began to call all the Johnsons in the phone book in Elgin. I finally got a hold of Rory's son. He too said that it was real, but I got nowhere. Around 1992, I met Jerry Orlowski, and he told me his experience as the employee of Greyhound who was sent to investigate the technology, since he wound electric motors for several years. Jerry was very upset about the whole incident, particularly Greyhound's Board of Directors refusal to utilize the technology after he found the technology to be authentic. Jerry even witnessed the government's seizure of the motors in California. --- Terry Sisson."

Hydro-Magnetic Dynamo

The hydro-magnetic dynamo is a doughnut-shaped large-scale emission-free electrical generator which does not requires external fueling and operates safely, reliably and silently at moderate temperatures. The dynamo is capable of powering larger transportation vehicles such as buses, trucks, ships, locomotives, and airplanes. Doubt remains about making dynamos compact enough to power automobiles.

The circumstantial evidence for the Russian inventor's performance claims for his hydro-magnetic dynamo is reasonably strong. While three experimental prototypes have been built with Russian and Armenian expertise and equipment, a fourth demonstration prototype needs to be built with more modern Western engineering expertise and equipment to verify dynamo performance claims and to further explore the dynamo's potential capabilities. Performance claims are as follows:

Hydro-magnetic dynamos are scalable from 100 kilowatts to 1,000 megawatts. One doughnut-shaped, fuel-less 1000-megawatt dynamo is about the size of a two-car garage. For comparison, Hoover Dam's 17 generators have a total nameplate capacity of 2,080 megawatts. Seven 1000-megawatt dynamos can be vertically stacked to comprise a single 7000-megawatt dynamo.

A dynamo can reliably run continuously for 25 years or more with little or no maintenance, no external fuel source, and no pollution. If a dynamo's output is 1,000,000 watts, its total input power is approximately 10,000 watts. So the dynamo's energy efficiency is 10,000%, or 100 to 1.

The source of the dynamo's massive electrical output is a nuclear reaction which is not generally known to mainstream science. However, it is known that the dynamo produces alpha particles which are helium nuclei made from fused deuterium, an isotope of hydrogen with one proton and one neutron. The electrons missing from the helium nuclei are what seem to provide a copious "sink" of electricity, and which happen to be the secret to the dynamo's ability to generate an exceptionally large amount of electricity.

It is also known that the dynamo uses high-density charge clusters. High-density charge clusters are the basis of plasma-injected transmutation of elements and also neutralization of radioactive materials.

There were three dynamo prototypes built. The first two small experimental prototypes were built in Vladivostok. The third and last prototype continuously generated electricity, except when turned off to incorporate improvements, from 1992 to January 1997 in Armenia. (It was sadly destroyed during an armed rebellion by local religious fanatics who were unhappy with the Armenian government.) It generated a constant current of 6,800 amperes at 220 volts DC. That multiplies out to nearly 1.5 megawatts. The Armenian prototype dynamo's toroid weighed 900 kilograms and had a diameter of approximately 2 meters.

Cooling water is circulated through copper pipes wrapped around the toroid. The heat is expelled from the cooling water with a heat exchanger.

After a dynamo is assembled in a factory, the water is literally jump-started (by discharging a large bank of capacitors) to moving around the toroid. The dynamo's controls are temporarily set to generating enough of a modest amount of electricity to sustain itself, even while being transported from the factory to its site. For the Armenian prototype dynamo, two 10-farad capacitor banks (from Russian military radar stations) were used to provide the initial water motion (acceleration and excitation of water). Using a total of 20,000 joules, 100,000 volts with 0.05 amperes of current were applied to the Armenian dynamo for 3 - 5 minutes for starting its generation of electricity.

After these Russian radar capacitors were used to jump-start the Armenian prototype dynamo, a bank of buffer batteries sustained continuous operation when water motion and ionizing occurs. This battery bank contained 8 powerful 12-volt, 150-ampere lead batteries. The Armenian dynamo's sustaining input power was 14,400 watts. The nominal maximum output power is nearly 1,500,000 watts. Once, the output current was accidentally increased to 40,000 amperes for almost a minute. Fortunately, the power was reduced to a safe level before the water started to boil. Internal coils (windings) control water velocity and therefore dynamo power.

The dynamo's production cost is estimated at $500 per kilowatt which is competitive to nuclear power’s capital costs of $5,000 per kilowatt, windmill capital costs of $4,000 per kilowatt, etc. A well-run nuclear power plant can generate power for 1.5 cents per kilowatt-hour, coal 1.8 cents, natural gas 3.4 cents, and oil 4.1 cents, on the average. The dynamo’s operating cost would be approximately .1 cent per kilowatt-hour with no external fuel needed nor pollution.

Dynamos could replace all nuclear power plants, solar installations, wood-burning furnaces, hydro-electric dams, windmills, fossil-fueled power plants, etc. Satellites, locomotives, heavy trucks, buses, airplanes, and ships are obvious transportation applications. It does not seem that dynamos can be made compact enough to power electric cars although it certainly would be worth trying.

A Forbes article states that PECO (formerly Philadelphia Electric Company), with an income stream to back it up, was able to sell on Wall Street $4 billion worth of bonds paying 5.8 per cent. A dynamo manufacturer could simply sell bonds to build and operate dynamos at a low interest rate. Dynamo loan payback times may be in the ball park of a half-year to a year, depending on the local electricity market price. As soon as a dynamo is paid for, the revenue from that time on would be almost pure profit.

Once a track record is established by successfully installing a few dynamos, the dynamo company could raise money to build more dynamos by simply selling billions of dollars of bonds instead of stock. So therefore, there wouldn't be any dilution of ownership.

A recent IEEE Spectrum article stated that world demand for electricity increases approximately 500 megawatts every day. To put this in perspective, the equivalent of another Hoover Dam would have to be built every four days to keep up with world electricity increase demands. Or, a dynamo manufacturing company would have to build another 500-megawatt dynamo every single day of the year to keep up with world electricity increase demand in addition to replacing all existing generators fueled by hydro, nuclear, and fossil fuels.

The following is a highly condensed summary of the "Description" of the dynamo's Russian patent IPC H 02 K 44/00 “Method of deriving of electrical energy and organization of Gritskevich’s MHD-generator for its realization”:

The dynamo is a sealed toroid filled with distilled water with heavy water (deuterium oxide) added. Movement of water inside the closed loop and use of unique properties of water as a polar liquid cause a release of electrical energy as an outcome of a rupture of hydrogen connections. Additional electrical energy is drawn from nuclear reactions and micro-cavitational processes. The liquid gets ionized and moving around the toroid at start-up time by a running magnetic field with the help of stimulating electromagnetic windings.

A layer of segnetoelectrical material covers the internal surfaces of the toroid. 32 electrodes made from a hard-alloy material are inserted into the toroid at equal distances apart. These 32 electrodes are connected to a power supply. Additional stimulation windings are also connected to the power supply.

The partially pre-ionized (on the part of the heavy water) water gets ionized further by the high-voltage discharges by the 32 electrodes. With the help of the stimulation windings, a running magnetic field is created which moves the water in one direction inside the toroid. An electromotive force gets created by the electromagnetic induction in a separate set of windings. During the movement of the water stream free electrons get created, and an additional energy gets emitted because of the water’s friction (viscosity) against the layer coated on the inside surface of the toroid, because of electrostatic breakdowns of cavitatal-vacuum structures, and because of the ongoing nuclear reaction. 100 times as much electrical energy is generated as required for electrical energy input.

Note that the hydro-magnetic dynamo is always producing electricity once it is manufactured and jump-started at the factory. Whenever a locomotive is parked in sub-freezing weather, its hydro-magnetic dynamo’s electricity output would be used to heat the dynamo’s containment to prevent its water-filled toroid from freezing.

Whenever a locomotive is parked, its hydro-magnetic dynamo’s excess electrical output could be sold to the local power grid.

IPMS Energy Storage/Battery Device

During the summer of 1984, airborne intelligence surveillance teams of the United States Air Force, operating out of specially configured and equipped Boeing 707 airframes (called AWAC’s) electronically detected (and then shortly thereafter photographed) bursts of coherent light of

enormous power originating in the vicinity of Dushambe, Turkministan. The bursts of light, a brilliant blue-green color, lasted just a few seconds and were shifted almost to the ultraviolet end of the light spectrum. The "laser" beams were directed upwards out of the atmosphere towards American military communications satellites.

At precisely the same time the AWAC's detected and photographed the laser bursts (they were referred to in that jargon by American military analysts but later proved to be something almost entirely different), several of the satellites essential to America's global military command and control communications systems became inexplicably inoperable.

The Defense Intelligence Agency, under the direction of the National Security Council and assisted by the National Security Agency, escalated its surveillance of the remote site in the Ural Mountains from which the bursts first originated. For several months, during a concerted campaign of uninterrupted observation by AWAC's and American spy satellites, no additional bursts were observed or reported. Then, without warning, in the middle of the night nearly seven months later, AWAC's crews operating just outside the territorial airspace of Afghanistan detected similar laser bursts of lower intensity during a period of intensive localized ground warfare.

The Afghanistan bursts were apparently aimed at targets under attack by Soviet infantry units. The laser bursts continued in a sustained, localized but obviously mobile attack pattern, as frequently as four or five times per hour, until nearly sunset of the next day. Photographic evidence gathered at the time by the AWAC's crew, and later corroborated by photographs taken at the actual site of the fire fight and forwarded to the U.S. for analysis, showed that the targets of the laser bursts were ammunition and fuel supply depots located in the remote desert. Several of the ammunition and fuel caches had apparently been destroyed during the attack, as demonstrated by the evidence of explosions, fire, smoke and residual infra-red heat patterns detected, photographed and electronically recorded on-board the AWAC's.

All this information was transmitted (via encrypted communications bursts, routed through the military Global Command Control satellite system) to the National Security Agency (NSA), located at Fort Meade, Maryland. Analysts there recognized that they were looking at evidence of a weapons system which had never been observed before. They did not know what had produced the laser bursts. But they did know that the technology which made such a thing possible was not available to the countries participating in the NATO Convention. They were terrified at the implications of such a development.

Within hours, the information was packaged into classified documents and conveyed to the Joint Chiefs of Staff. The Joint Chiefs examined the information while they were being briefed by the AWAC's crews which had witnessed and recorded the events. After the briefing, the crews were dismantled, and their various members stationed far away from one another, with orders never to discuss the events they had witnessed. Officially, the laser bursts never had occurred.

Secretary of Defense Frank Carlucci took delivery of the packet at his residence in Falls Church, Virginia, three days later, at a private, secret meeting held in the middle of the night. No one has yet adequately explained why the Joint Chiefs waited three full days to brief the Secretary. Early the next morning, he was driven in a specially prepared bulletproof limousine to the White House. He personally delivered the information to the new President of the United States, Ronald Reagan. The content of the Secretary's report had an immediate, measurable impact.

It was this series of events which principally precipitated the Strategic Defense Initiative, a program of military defense and reprisal based on America's state-of-the-art satellite-borne laser-optical and particle accelerator technologies. The S.D.I. system was intended to provide the U.S. with a meaningful deterrent to further aggressive use of the technology developed by the Soviet Military.

There was only one problem with this system, aside from the fact that its astronomical costs almost bankrupted the American economy: it did not work. S.D.I. was designed to respond to a kind of technology which was not achievable in the West, and which could not be explained by any of the models, materials, technologies or sciences known in the West.

In 1985, the top-secret military version of the space shuttle, code named Atlantis, embarked on a special orbital mission. One of its mission assignments was to retrieve, examine or photograph the military spy satellites which had been disabled by the laser bursts recorded in 1979-84. The results of this investigation have not been declassified or released in any but the most censored version to the public. What we do know for certain, as a matter of publicly available non-classified information, however, is that each of the disabled satellites appeared to have had at least one, and in some cases as many as four or five precisely measured holes, approximately the size of an American silver dollar, melted completely through them from the outside.

The photographs taken of the satellites show evidence of intense heat, charring and carbonized residue evenly distributed around the perimeter of each hole. The evidence is clear and unmistakable – the satellites were disabled by a coherent beam of some sort, characterized by such intense energy that it was possible to melt consistently measured holes through the exterior and interior components of American military satellites, after having passed through the atmosphere of the planet and into space for as many as 325 miles. Such a thing has scarcely been dreamed of by the American military, much less put into any but the most nominally effective operational form.

After more than ten years of political, economic and technological wrangling, and after the expenditure of more than one hundred twenty billion dollars in largely ineffectual research and development efforts, it is inescapably clear that no amount of money or political pressure, no amount of geo-political posturing or economic sanctions was going to compel the disclosure or replication of the technologies which produced the results photographed over the Carpathian Mountains and the Afghanistan deserts. The Soviets had developed a weapons system which was so revolutionary that it could not be explained, replicated or defended against.

The Reagan Administration's lack of specificity about the nature of the implied threat to which S.D.I. was supposed to respond subjected the Administration, the Defense Department and the R&D proponents of the most prominent American aerospace corporations to an endless barrage of charges by the Press and the Congress. They were characterized as being disingenuous and accused of being unreasonably secretive during successive appropriations battles in the Congress.

The truth of matter is that the Administration and the Pentagon were not being disingenuous at all. They simply could not admit to the American public that they were attempting to develop an effective response to a weapons system which they did not understand and could not replicate.

There are a number of issues intrinsic to this set of circumstances, along with several dozen others which, though less well known or economically dramatic, are no less important from a technological standpoint. It is certain that the implication of these technologies has not been lost on those multi-national corporations whose entire capital structure may be threatened by the new

sciences, technologies and materials which have been developed in secret laboratories, hidden in caverns excavated beneath the Carpathian Mountains, in the former Soviet Union.

Over the past decade the West has enjoyed occasional gratuitous glimpses into the heart of Soviet science. Attempts to disclose or discuss these developments in the press have been ruthlessly suppressed by powerful special interests vested in both the public and private sectors.

The science which underlies the series of events recounted here remains at the outer limits of the most advanced technology of which the West is capable. The questions posed by the military and corporate analysts about this laser beam weapons system are far-reaching in their scope and implications. Some of them are illustrative:

1) New Model of Quantum Mechanics: The sciences and models of quantum mechanics which produced such stunning recent developments in the West as the laser and maser make quite clear how much energy is required to create a beam of coherent light powerful enough to penetrate the atmosphere, retain its coherence in spite of atmospheric diffraction (and other effects described in quantum mechanics as "thermal blooming"), and melt a two-inch hole clear through a satellite made of the most sophisticated alloys ever produced in the West. Except for limited short-distance demonstrations conducted with industrial grade lasers used in cutting operations, there is no known combination of materials or technologies extant in the West to make such a thing possible.

2) New Materials: The materials necessary to create an electrical charge large enough to power a device capable of producing such a beam certainly do exist. In quantum mechanics the term large enough does not make sense, but we can agree for the purposes of this discussion on the effect of it as represented by such commonly accepted constructs as frequency, voltage, current and ionic flow rates [as distinguished by the phenomenon of resistance].

Hydroelectric plants and large, fixed-base nuclear power plants are capable of producing enough energy to theoretically power such a device. But the energy bursts in both the Carpathians and the Afghan desert were generated by sources which moved from one location to another. In order to do that, several additional considerations must be addressed:

a. Portability: The power source would have to be transportable or be capable of storing sufficient energy to repeatedly power such a device. Western technology cannot produce either a portable power production unit or energy storage system capable of the performance requirements everyone agrees must be met to make the weapons system work, either in the laboratory or in the field. System portability was the most puzzling feature of the NSA/DIA report.

When carefully analyzed, the computer-enhanced enlargements of the photographs taken by the spy satellites and AWAC's crews failed to provide evidence of any tracks which could be attributed to wheeled or tracked vehicles operating in the precise locations and at the same time as the laser bursts which were observed. The implications of this set of circumstances was almost too much to believe – the devices were apparently either hand held or transportable and rechargeable in such a way as to allow them to be transported by one or more foot soldiers, without vehicular support.

b. Enormous Power Requirement: The materials and technologies used to construct a device capable of generating a beam of such enormous power and magnitude would have to be sufficiently advanced to enable the components to be transported without damage over significant distances in unpaved areas of very rough terrain. Such strategies, engineering techniques, construction technologies or materials do not exist in the Western inventory.

c. The continuous repetition of the laser bursts suggests that the devices can be operated repeatedly at short intervals of 12-15 minutes. This means they can be triggered with significantly higher frequency and intensity than anything which can be produced in the West, even for laboratory use. Industrial strength lasers used to cut metals require careful setup, accommodate only limited use in short bursts, require extensive cooling and must be continually recalibrated. These limitations obviously did not apply to the devices being operated in the Afghan desert. Analysts at AMTL agreed that the units would either have to be recharged via an external, independent device or somehow be capable of self-recharging in the field.

Such a thing is almost unthinkable by current Western military standards. Not only can we still not replicate the technology in any meaningful form, but the Soviets had refined the technology to a point which allowed it to be carried on the shoulders of ordinary foot soldiers and recharged in the field without motorized support.

Unbelievable! How was such a thing possible? According to some of the highly qualified scientists who scrutinized the photographs, it is not possible. The "Not Invented Here" syndrome is alive and well in the American engineering community. Some of them still insist that the pictures were either fabricated or demonstrate something completely different than this narrative suggests.

3) Energy Recharge-Batteries: How did such high-intensity laser beam generators get recharged in the middle of the Afghan desert, in the absence of powered support vehicles or fixed-based power plants? There are a number of possible alternatives. They could have been powered by some sort of advanced battery technology. It's possible, but if the battery technology used in the West is used as a model to support such a thesis, it would take a bank of the most sophisticated batteries ever designed by NASA, arrayed in series and parallel configurations larger than five full-sized Soviet T-60 tiger tanks to power such a device.

This theoretical battery bank, operating at 100% efficiency (which is not practically or theoretically possible; the best batteries manufactured in the West operate at less than 60% discharge efficiency), could conceivably produce enough direct current voltage (in a zero resistance super conductive circuit, which is not possible, either) to perhaps produce one burst of light equal in intensity to 20% of the power required to burn a 2-inch hole through a satellite moving at 20,000 miles per hour at a distance of 325 miles.
Soviet ground forces were generating bursts of this magnitude every 12-15 minutes for more than 10 hours with nothing but ground troops. During eight hours of this exchange, it was totally dark. Something pretty remarkable must have been going on to make such a thing possible.

4) Energy Recharge – Solar Cells: Another alternative would have been to have whatever energy storage devices were being used to power the "laser cannons" recharged by sunlight. The state-of-the-art in photo-voltaic cells produced in the West simply would not support such an undertaking. The very best solar cells ever produced in the West have been produced by the Japanese.

These cells operate at a maximum of 19% efficiency - that is, they convert as much as 19% of the ambient visible sunlight shining on a clear, cloudless day into ion flow, which then becomes low voltage direct electrical current flowing through a circuit. The Japanese panels require months per section to manufacture and literally cost more than their weight in gold to manufacture. They are very heavy and are so sensitive to vibration and calibration that once installed, they cannot be moved at all.

Photo-voltaic cells capable of providing enough electricity to recharge a theoretically infinite energy well would have to operate at efficiencies of 50-80% to recharge batteries of infinite electrical capacity with enough power to trigger such a device. Such cells would have to be very light weight and able to withstand extremes of heat, cold, vibration, dust, wind and other conditions encountered in a hostile battlefield environment. Nothing like that exists in the Western technological arsenal.

5) Dielectric Materials – Transformers and Capacitors: Another consideration must be reconciled before this issue can be theoretically put to rest. In order to produce a burst of coherent light of sufficient intensity to have the effect which was observed and recorded by the surveillance teams, the voltage and amperage required to support such a device would have to be staggeringly high. In order to operate at all, the voltage supplied to the system must be released all at once, not in a continuous stream but in a single coherent burst so intense that any materials known in the West would either evaporate or melt. Not only would the best dielectric materials known to Western Science melt because of the heat produced by such enormous energy bursts, but before a bolt of energy of this magnitude could even be released to such a device, it would have to be accumulated and stored somehow.

A similar set of requirements of a less dramatic type is present in all the electronic devices manufactured and marketed in the West. This includes the entire range of electronic devices such as VCR's, computers, televisions and sound components, telecommunications, information storage, transmission and retrieval systems of every kind. We could not live as we do without them. The components which convert, store and release ion flow into the circuitry of these devices are known as transistors, transformers and capacitors.

This discussion delves into a slightly technical area here, so non-scientific types will need to either become familiar with the fundamentals of electricity to understand what is meant or simply give it a possibility that what is developed in the next section is a true representation of the way such things actually operate. The discussion deals with such commonly used and seldom understood concepts as voltage, current, frequencies and resistance.

(a) Transformers convert voltage at one level of current (amperage) to either higher or lower voltage levels. When the voltage is increased, the amperage or current is proportionately decreased. A low voltage produced at a high current level can be transformed into a much higher voltage at a proportionately lower level of current or "power."

(b) Capacitors: The decrease in amperage which accompanies a transformation of low voltage to higher voltage is often compensated for by a device known as a capacitor. In the most simplistic terms, capacitors "store" electrical energy until the amount of voltage and current reach a certain minimal threshold. When that point is reached, the entire store of energy is released all at once in a single burst.

The tantalum materials used in the West to manufacture such devices conform to certain standard rules which are commonly accepted by electrical engineers. These rules have only recently been stretched by new technologies and materials developed in the West. For the purposes of this discussion, though, it is safe to say that electrical engineers have long relied on these rules because they have always produced the same results when applied in the same way. Here's an example.

It is standard engineering fare which dictates that a transformer capable of accommodating one volt at one ampere of current across a grid of one ohm of resistance will be one cubic meter in

dimension. If followed to its logical conclusion, this standard rule of electrical engineering would require that a transformer capable of supporting a laser burst device of the kind operated by the Soviet ground forces in the Afghan desert would have to be approximately the size of a building built on a base 100 feet to a side, nearly 150 feet high.

Surely such a device could not have been hidden from the AWAC's eye in the sky which can clearly photograph the letters on a license plate from 60,000 feet altitude, nor could it have been moved on the shoulders of ground troops without wheeled vehicular support. The fact that there was absolutely no trace of such a huge, massive transformer device (or any other kind of structure or vehicle which could be construed to serve that purpose) means that something else must have been used instead. Military analysts had absolutely no idea what it could have been.

Such a burst system cannot operate without a capacitor of some sort. A capacitive device capable of storing the amount of energy required to power a single burst from a laser cannon, made of the most advanced dielectric material known in the West, would have to have been equally massive and, further, would have to have been cooled by some sort of strategy which would have been instantly and unmistakably detected by the infrared cameras and spectroscopic scanners used aboard the AWAC's and the spy satellites which investigated the scene.

The practical requirements of such a system are best demonstrated by the massive equipment required to operate and cool the Super Conductor Super Collider linear particle accelerators recently designed by the United States and Japan. No evidence of any such capacitive device was recorded in either the Carpathian Mountains or the Afghanistan desert. How can we explain it?

Without going into any detail about how the technologies were developed, suffice it for now to say that the Soviet ground forces in Afghanistan were equipped with a prototype of a hand-held plasma beam accelerator, the likes of which had only been roughly imagined by American military analysts. The device relied on some innovative strategies. Among these were:

Energy Storage Devices: The power source for the Soviet light cannons was comprised of a back-pack array of specially designed energy storage devices. The closest thing we have in our vocabulary to compare to them is described by the term "battery." In the limited sense that these devices store electrical energy, they are batteries. Any other similarity to the batteries we are accustomed to in the West ends there. The literal translation of the Russian name for them is energy accumulators.

The batteries relied on in the West are based on the chemical properties of components which, when combined in certain configurations and proportions, interact chemically with one another. The result of this chemical interaction is that it creates both heat and a stream of liberated ions – electricity. In dry cell batteries, the process of chemical interaction is one way – once they have been expended, they are simply disposed of. It is estimated that more than 12 billion expended dry cell and lead-acid batteries are dumped into America's landfills every year.

Other batteries are designed and constructed so that the chemical reactions which liberate electrical current are reversible in some degree. These rechargeable cells are characterized by the lead-acid batteries which are used in automobiles and in commercial and industrial applications. Various strategies have been developed to make batteries relying on chemical reactions maximally effective, but the theoretical limits of effectiveness of such devices have surely been reached.

A consortium of aerospace companies working with NASA recently announced the development of an advanced sodium-hydride-based rechargeable cell which is the most efficient battery yet invented in the West. Unfortunately, it operates at an ambient temperature of 2000 degrees centigrade and, if allowed to reach temperatures outside a very narrow safe operating zone, will explode with the force of a small thermo-nuclear device of approximately ten-kiloton yield. It is not safe, but it is the best Western science has come up with.

The energy storage device developed by the I.N. Frantsevich Institute for Problems of Materials Science (IPMS), Kiev, Ukraine, works on a completely different principle. Its construction is the result of a completely unique nonlinear quantum mechanical model which makes it possible to create crystalline lattices of absolutely pure carbon (and other materials) in sheets of infinitely variable dimension which are exactly one molecule thick. The crystal formation techniques and the whole body of new science which allows for their creation in the first place are completely unknown to Western science.

The mono-molecular sheets deposited by this technique are wrapped back and forth on top of each other, more than one million times per millimeter, and are separated from each other by a distance of less than one atomic diameter. At this level of construction, the material becomes subject to the rules of quantum mechanics which are almost entirely probabilistic. That means a whole atom of carbon (or almost anything else except an electron or photon) will not fit in the space which separates the lattice sheets.

When viewed under an electron microscope, the sheets produce a pattern which looks for all the world like an endless field of four-sided pyramids, connected base to base, on a single plane, with the tips of the pyramids protruding endlessly, uniformly upwards. When wrapped back and forth on top of each other, these sheets of pure carbon crystal, made of carbon molecules shaped like trillions of identical tiny pyramids, all arrayed endlessly in identical formation, are positioned so that the tips of the pyramids on the bottom sheet are matched with the tips of the pyramids on the top sheets. What remains between the pyramid tips are open “spaces” or energy wells.

The quantum physics which describes the characteristics of the energy wells created between the layers of crystalline lattice is largely unknown to Western physicists. The Soviet model predicts with a high degree of probability that the quanta of energy referred to in the West as electrons (and, in some cases, photons), the stuff of which electricity is made, will, when introduced to the lattice structure, search, find and fit into the energy wells with military precision.

During the recharging or loading phase, the energy storage devices made of the crystalline lattice material channel one electron at a time into each well created by four carbon pyramids on the bottom layer and four carbon pyramids on the top layer. Because the rules of quantum mechanics which operate in this tiny environment demand it, each electron or quanta of energy has a certain polarity, spin and “color” (and other mathematically defined characteristics) which must be accommodated if it is to find, fit and stay in an energy well. Interestingly enough, when a current is applied across the lattice-work structure, the electrons behave precisely as nonlinear quantum mechanics predicts they will. They flow much like a fluid into the lattice field, then separate into individual energy quanta and spin into the last energy well in each layer, automatically adjusting their individual spin, polarity and color to match their characteristics to fit the requirements of each well, until the lattice is full.

Because no chemical reactions are involved in the process of marching electrons into or out of the energy well fields, there is no resistance in the circuit. In the absence of resistance, the electrons fill

the wells at light speed, never missing a space, automatically adjusting polarity, spin and other characteristics, and creating no heat. The amount of time required to "charge" such a cell is less than 5% of the time required to recharge a conventional chemical battery of similar voltage and current.

The validity of $E = MC^2$ is called into question by the way these devices function. When the battery is fully charged, it actually demonstrates more mass than when the energy storage device is empty or discharged. The laws of quantum mechanics relied on in the West state categorically that this is not possible. It is the answer to the question, "How much does a beam of light weigh?"

According to the Soviet model, this is precisely as it should be. When this phenomenon was first demonstrated to scientists in the West who were testing the energy storage devices at INEEL in Idaho, they were thunderstruck. The quanta of energy, or electrons as we refer to them, which are poured into the crystalline lattice demonstrate characteristics of mass even though they are bundles of pure energy sitting in stasis, literally at rest. The characteristic of mass is verifiable – you can measure it by weighing the energy storage devices before and after they are charged. When they are charged, they demonstrate appreciably more mass than when they are fully discharged.

If this is confusing to you, to suggest that pure energy can be shown to demonstrate verifiable mass while at rest (in stasis), perhaps you can begin to appreciate how fundamentally different the physics of all this is when viewed in the terms of Einstein's classic equation $E = MC^2$.

The existence of this technology clearly is proof positive that not only does energy demonstrate the characteristics of mass, but it does so in a state of non-motion or stasis, sitting idly in an energy well. A state of stasis is a very far cry from the terminal theoretical velocity required by the constant in Einstein's equation, equivalent to the square of the speed of light.

The scientific implications of this phenomenon are truly staggering. At very least, the verification of mass as a property of energy quanta at rest suggests that Einstein's theory of relativity may be altogether incorrect as a means of describing the dynamics underlying the real nature of the material world and its relationship to energy.

The existence of this technology suggests at very least, that energy and mass are equivalent characteristics of all things which are manifest in the material world. It is this fundamental contextual difference which distinguishes the Soviet model of quantum mechanics from the Western model. "The proof of the pudding," they say, "is in the eating."

Theoretical physicists may argue endlessly about the validity of the assumptions relied on by the IPMS scientists to develop their unique sciences, technologies and materials. But they cannot argue about the existence of the materials which have arisen from that context. They are as real as they can be. And they are unlike anything ever seen or contemplated in the West.

In the same way energy quanta stored in the energy wells of crystalline lattice materials demonstrate complete mathematical satisfaction with staying there indefinitely, when allowed to flow out in the form of an outgoing wave of electrical discharge, these quanta (electrons or photons, as you prefer) march right back out without resistance at light speed through a closed circuit to another use.

When these energy storage devices are discharged, they demonstrate other attributes which are not known in Western science, and which, because of the very nature of the chemical reactions we are accustomed to, are not theoretically possible according to conventional wisdom. Conventional

chemical batteries, when fully charged, produce electric current at a useable voltage for perhaps 30-40% of the total discharge cycle. After that, either the voltage or amperage (or both) drop to low enough levels that the devices being powered by them cannot recognize or use the electrical current which remains available. At that point, the batteries either have to be recharged or replaced.

The crystal lattice batteries have been demonstrated to produce precisely the same current and voltage levels throughout 98% of their discharge cycle. They produce no heat during discharge, regardless of the rate at which they are discharged. This is absolutely contrary to our experience with batteries, transformers or capacitors. Until the crystalline lattice materials were specifically engineered to register an electronically detectable blip at 95-96% discharge, it was impossible even for the scientists who developed them to distinguish a partially discharged battery from a fully charged one.

There is another characteristic which is intrinsic to energy storage devices which comes into play here. It is a characteristic of materials which is described as energy density. For non-scientific readers, this concept can simply be construed to mean the amount of measurable electrical current which can be produced by any device or material when its mass is converted into electrical energy. The concept is expressed in mathematical formulas as the number of watts and hours of consumable energy which can be converted from each kilogram of material. It is expressed as watt-hours per kilogram.

Here is an example we can all understand. Consider gasoline. When converted into electrical power at 100% efficiency, gasoline has been theoretically shown to have an energy density of between 550 and 600 watt-hours per kilogram of mass. In easy terms, that means that if one kilogram of gasoline were converted into pure electricity at 100% efficiency (with no loss due to heat, resistance, waste, etc.), the reservoir of energy would power a 100-watt light bulb for 5.5 to 6 hours.

Most of the high-end conventional automobile batteries of the lead-acid variety operate at an energy density rate of between 20-25 watt-hours per kilogram. The best NASA sodium-hydride batteries operate at 48-50 watt hours per kilogram. The energy accumulator devices which have been tested at the Idaho National Electronic Laboratories have demonstrated energy densities of between 850 and 1050 watt-hours per kilogram.

What does this mean in practical terms? It means, for one thing, that for the first time in the history of science an energy storage device has been created with an energy density which is greater than gasoline or any other refined fossil fuel. It means that devices which rely on these energy storage technologies can theoretically be designed to store and deliver clean electrical power at higher rates of efficiency than any fossil fuel ever discovered.

The global implications of this technology are irresistible. It means, among other things, that the technology exists, right now, to eliminate the need to build another nuclear power plant or dam another river to produce hydroelectric power. It means we can no longer justify burning another ounce of petroleum, another piece of coal, another cubic centimeter of natural (or unnatural gas) or another tree to produce heat, electricity or power for any purpose, including transportation.

When coupled with the plasma beam devices being tested by the Soviet infantry units in Afghanistan, these energy storage devices operated at such unbelievably high rates of discharge efficiency that they made it possible to repeatedly induce huge electrical discharges in a highly mobile configuration.

The same technologies which were used to produce the energy storage devices have been adapted to create transformers and capacitors with previously unimaginable performance characteristics. Instead of adhering to the conventional western model of "One Volt at One Amp across a resistance of One Ohm equals One Cubic Meter," the Soviets have produced a capacitor which measures more than 1200 farads at 10,000 amperes in a package the size of a tuna sandwich.

When tested by the Technology Materials Testing Laboratory of the Defense Department at the Pentagon and at the I.N.E.E.L. in Idaho, totally new testing equipment had to be designed, engineered and constructed just to test the devices. The scientists at those laboratories had never tested anything like these materials before.

Instead of having to house transformer and capacitor devices in a series of trailers towed by diesel tractors or huge fixed-base facilities, the operating apparatus which supplied transformed power and high intensity capacitive bursts to the light cannons weighed less than ten pounds and could easily be transported in a backpack by a foot soldier.

One final question remains unanswered. "How did the energy storage devices, once dissipated or discharged, become recharged in the field, especially in the dark of night?"

The back-pack plasma beam device detected by the AWAC's during limited combat use in the Afghanistan desert was powered by energy storage devices constructed of crystalline lattice materials. After each laser burst, the energy storage devices were recharged every 12-15 minutes (nearly 45 minutes in the dark of night – the residual ambient heat of the desert is a very efficient source of infrared energy) by sunlight, collected and converted to electricity by four-foot square panels of "solar cell" material arrayed on a pole like a flag, each weighing less than ten ounces.

The electrical energy stored in the back-pack energy accumulators was transformed into enormously high voltages and released at almost unbelievably high current levels when the super-capacitors were sufficiently charged. The beam of "light" detected by the AWAC's crews was a field of plasma, flowing at the speed of light and demonstrating characteristics of mass (and, therefore, kinetic energy). The phenomenon represented by these bolts of lightning are not comprehensible according to the model of quantum mechanics and plasma physics currently being used in the West.

Battery packs utilizing these energy accumulator materials have been designed, produced and tested which provide more than 14 hours of continuously transmitted power on a single charge to conventional hand-held cellular telephone devices. Similar improvements in conventional battery/energy storage capacity have been developed and are being tested for such devices as video camcorders, laptop and portable computers and other similar consumer, commercial, industrial and military applications.

IPMS research in the field of layered crystals has thus led to the creation of capacitors with a very high level of capacitance (measured in farads). This technology is based on a revolutionary production technique which forms polarized surfaces of one molecule thickness, separated by less than one atomic diameter of space, held together by weak Van der Waals energy forces. The special properties created by these layered crystalline structures provide previously unimaginable internal surface areas. Super capacitors are constructed of layered materials numbering more than one million dipole sheets for each millimeter of crystal thickness.

These devices provide a virtually limitless number of charge-discharge cycles at astonishingly rapid charge and discharge rates. The potential impact of such devices on all electronic equipment currently being produced is incalculable, since virtually all electronic devices rely extensively on the West's state-of-the-art tantalum capacitance technologies.

At present, IPMS has on hand (among others) a super-capacitor roughly the size and dimension of a sandwich which develops more than 1,200 farads at 10,000 amperes. It also boasts production of a battery whose active mass energy density exceeds 850 watt-hours per kilogram. For the non-scientist (and all the rest of us as well) this means that a "battery" has been produced which, for the first time in history, produces more power per unit of mass than any fossil fuel ever devised.

Prototype testing of larger-scaled devices designed specifically for providing power to electric vehicles is currently underway. Prototypes are expected to be capable of sustained highway speeds of up to 70 miles per hour with a range of 525 miles on a single charge. The power plant for this application has been recently improved by the inclusion of a proprietary solid-state ceramic electric motor which weighs 7.2 kilograms and produces 100 horsepower on 12-volt direct current. For comparison, an electric vehicle employing a 100-horsepower electric motor performs the same as with a 500-horsepower gasoline engine.

If these performance attainments can be sustained in broad-based applications, electrically powered vehicles could be produced which would meet or exceed virtually all performance characteristics currently available in equipment relying on internal combustion, petroleum-based engines. Gasoline/diesel-powered transportation devices can be replaced by cleaner, more efficient and significantly less expensive alternatives.

The world market for current energy storage applications which will be superseded by these energy storage technologies is estimated to be in excess of $24 billion per year (1991), exclusive of electric vehicle considerations.

Metamatter

9/25/1997 11:16 AM
From: Robert Bass
To: James Bowery<jabowery@netcom.com>;
CC: Robert W. Bass<rbrtbass@pahrump.com>;Gary Vesperman<vman@skylink.net>;
Subject: for the postulated "Bass page"?

Jim,

I just went to http://www.generalstore.com/ and see nothing but "under construction, etc." Is this you, or someone else in another state? Do you know how to (reasonably economically) do Mass-eMailings? Say either from a rented Data Base of known Investors, or just blindly to "millions"?

How about posting the following

Potentially Awesome Speculative Investment Opportunity?
==========
Venture SEED Capital? Low Risk, AWESOME Payback!!!

I seek one or more High-Technology-Oriented "High-Roller" Nerves Investor(s) who would be intrigued by the following proposition (if demonstrably sound and absolutely genuine): Suppose you go to "Super Monte-Carlo" in the sovereign nation of Erehwon, and you come to a table with a Croupier who says:

"I have here a coin the size of a U.S. silver dollar, which is perfectly evenly balanced between Heads and Tails to 10 decimal places [with the edge for Heads in the 11th decimal place]; and a certificate from the US Bureau of Standards certifying it is not "loaded" to favor either Heads or Tails to the best measurements they can make.

"You can flip the coin yourself.

"I have here Certificates of Deposit for $30 Billion in a centuries-old Swiss Bank of spotless reputation.

"My croupier's fee for allowing you to play is ridiculously modest.

"How much are you willing to wager on the honest flip?

"Now suppose the preceding scenario is repeated, except that several of the most reputable scientists in the world assure you that the coin is 'loaded' so that the chances of Heads are between 95% and 99%. Your own experts assure you that you have at worst One Chance in 20 of losing.

"Finally, the croupier says, you may play for $150,000."

To recapitulate, the odds are 20-to-1 that you will win $30 Billion, versus one chance in 20 that your entire $150,000 wager will be lost.

Would you play?

==========
-------PRIVATE Communication-----
------(NOT a Publication)--------
==========

I need Seed Capital of $150,000 under circumstances exactly analagous to those outlined in the Risk/Reward scenario above. If "Heads" comes up, then my patented Plasmasphere technology can be escalated to a Metamatter technology, where by METAMATTER I mean a solid, *crystallized* fully-ionized plasma.

An ordinary crystal has nuclei spaced apart distances of about 10^[-8] cm, the Bohr radius, because the electron cloud makes the atoms behave like little billiard balls of the size indicated.

However, in a plasma, the positively-charge nuclei and the electrons are equal in number, but the electrons are not in orbit around individual nuclei; they are "mixed up" as in a plum-pudding. Most plasma physicists will tell you that in order for hydrogen gas to be fully ionized (i.e., all electrons stripped from all nuclei) the temperature of the gas would have to be above 150,000 degrees Kelvin (i.e., 15 times hotter than the surface of the Sun). But this is demonstrably FALSE (both theoretically and experimentally).

If the gas is dense enough, it can be fully ionized at "low" temperatures, e.g. 5000 Kelvins [so-called "pressure ionization"].

Now suppose that the fully ionized low-temperature gas is condensed into the physical state of a liquid metal. I call this a Liquid Metallic Plasmoid (LMP). The characteristic of an LMP is that, like mercury, it keeps a constant volume; unlike a gas, it does not expand to fill all available space (if in a vacuum). The positive nuclei remain on average equidistant, and the electrons circulate around the dynamic lattice as in a giant crystalline molecule. Cook called it a "Cryscapade"; whereas others might call it a Liquid Crystal.

Fewer than a score people in the world understand that LMPs can exist. One LMP was photographed in half a dozen or so photos on the cover of the Journal of Applied Physics in 1957 by [later] Nitro-Nobel Medalist, physical chemist, Dr. Melvin Cook. The theory by which Cook explained his accidental discovery has been *independently* rediscovered (in 3 separate countries, USA, UK & France) by researchers seeking to explain the illusive natural phenomenon of Ball Lighting.

The late expert on High-Energy Lasers and Shock Tubes, Dr. Jay Blauer of Rockwell Rocketdyne, who died early of leukemia, helped me to design an experiment that would prove beyond shadow of a doubt that LMPs can be created at will. The basic idea is to use a combination of Shock Tube technology and High-Energy Laser technology, with my patented Plasmasphere technology, in order to achieve in a non-self-destructive, reusable device, what Cook discovered accidentally with high-explosives in a self-destructive experiment.

Once the mere EXISTENCE of producible-at-will LMPs is achieved (for the Risk Capital of $150K), it will be trivially easy to raise several million more for refinement of the device to move the LMP into a cryogenic vacuum chamber where (since it is electrically conductive) it can be magnetically levitated and allowed to cool by radiation.

Use of the Brush-Sahlin-Teller Equation of State (used to design the H-bomb) shows that as the LMP cools, its volume contracts, and it becomes more and more dense. There can be shown to scientists sufficiently expert to understand the evidence, a mass of recent experimental evidence (as well as expert theoretical evidence) that before the LMP gets down to room temperature it will crystallize into a Metastable Solid Crystal, namely a *new form of matter* never seen before on Earth!!!

The density will be intermediate between that of ordinary condensed matter and that of neutron stars, wherein a teaspoonful weighs tons.

I propose to manufacture 3 kinds of Micro-Crystals of Metamatter: MSP, MSD, and MSD. Each addresses in a truly *revolutionary* way a trillion-dollar market, with a multi-billion dollar profit potential. In many ways, Metamatter will have a bigger impact on human civilization than any prior discovery, including both computers and atomic energy! In fact, consider the following:

MSP (Meta-Stable Protium [hydrogen]) will be the IDEAL room-temperature Superconductor, which will revolutionized both the Computer/Electronics industry and the Electric Power industry.

MSD (Meta-Stable Deuterium [heavy-hydrogen]) will be the ideal 5th Generation Cold Fusion fuel; when triggered by an infra-red photon of 17.7 eV, a micro-pellet will undergo a phonon-mediated and Lattice-Catalyzed ANEUTRONIC chain-fusion reaction to cleanly release the energy of 10

sticks of dynamite, to make steam for mechanical heat and conversion at 67% efficiency into electrical energy. This can make both homes and automobiles independent of the present electrical utility companies, though they will still need to buy the almost dirt-cheap MSD fuel micro-pellets from Metamatter Industries.

MSH (Meta-Stable Helium) will be the IDEAL rocket propellant for expanding human civilization into the Solar System (e.g. to colonize Mars); when a micro-crystal of MSH is triggered by the right frequency of laser-light, it will return to the form of gas as if it had been compressed by tens of millions of atmospheres of pressure; it will release 43 times more energy per unit weight than any conceivable chemical combination!

During the mid 1980s, the Air Force Systems Command sent a group of 7 or 8 Colonels who held Doctorates in the physical or engineering sciences to scour the USA for 9 months, in groups of 2 or 3, and to report back on what futuristic technology would have the greatest potential impact on the USAF and USA economy by the year 2000 if reduced to actual practice. They listened to 600 industrial and academic presentations and selected MSH as the greatest payoff (for least risk) choice! The USAF Rocket Propulsion Lab was supposed to issue 8 parallel contracts for 8 "crash" projects to see if bulk MSH could be manufactured. I was slated to get one of the 8 contracts, but my approach (through solidifying a helium LMP) was radically different from that of the other 7 selected proposers.

With MSH as fuel, one could take a 50 percent payload to Mars and back in two weeks! (Accelerate there and return at one gee.)

But a Princeton professor of Physics, Will Happer, then Secretary of the JASONS [advisers to DOD/DOE], advanced theoretical arguments which appeared to shoot down the practicality of the other 7 approaches, and the whole project was canceled. But Happer's arguments are totally irrelevant to my approach. Moreover, Happer was later Chief Scientific Advisor to Admiral Watkins (Secretary of DOE) when the ERAB Report was produced.

Those who understand the recent work of Arata and Zhang in which the aneutronic conversion of deuterium nuclei to helium nuclei inside of a palladium lattice is recorded in Real Time (inside of a sealed apparatus which contains a Mass-Spectrometer and which give ZERO helium when the heavy-water deuterium is replaced by ordinary-water hydrogen) know that Aneutronic Cold Fusion (CF) is a demonstrable FACT and that Happer and the ERAB Report were WRONG. Therefore it is logical to consider the possibility that Happer was also wrong when, before he shot down CF, he also shot down MSH.

There is ZERO risk in producing an LMP; it is just that 99.999% of all scientists are ignorant of Cook's work.

There is a slight technical risk in crystallizing an LMP at room-temperature; conceivably, it will remain liquid until below the temperature of liquid nitrogen, in which case my proposal will have been a failure. But the payoff is so AWESOME, and the chances of failure so tiny, that the risk seems worth taking.

I can supply drawings of the Proof-of-Principle Process Prototype Plasmasphere demonstration designed by Dr. Blauer and myself. Jay Blauer told me that he could do the experiment in his spare time evenings and weekends "in two weeks" using shock-tube and laser equipment already in his lab at Rocketdyne, provided he had $10,000 cash for items and materials not on hand.

Several "reputable" labs have explained to me that they would not even consider bidding on doing the Bass-Blauer experiment for less than $100,000. I have personal contacts at 22 government and private labs (such as JPL, SRI, LANL, etc.) which I would like to visit with my former graduate student Dr. Lou Puls (who, unlike me, is an accomplished experimental plasma physicist) to make joint presentations on the theoretical and experimental aspects of creation of an LMP, preparatory to asking them to bid. After 22 weeks spent in such visits, (and paying Dr. Puls Consulting Fees) I expect to have $50,000 left to offer the Highest Bidder. I also expect that no one will bid less than $100,000. But I also expect that out of the 22 presentations, at least several will become so excited that they will offer to Cost Share. In several labs, the working-level scientists interested in LMPs have told me, "If you can get the Management to pay attention, we have in place already a mechanism and a precedent to Cost Share."

Remembering what happened to Fleischmann and Pons it will accomplish naught for me to take the $150K, rent the equipment, and do it in my own garage. Nobody will believe it, and nobody will pay any attention. However, if we spend 6 months getting suitable technical personnel of nationally reputable laboratories excited about the subject of LMPs, and then some lab with the prestige of, say, JPL or LANL or SRI, announces the production of an LMP, many other labs will immediately undertake to "catch up" and to replicate the result at their own expense. Once 3 or 4 labs have announced successful replication, no one will doubt and then it will be trivially easy to raise the venture capital to go from LMPs to solid, crystallized Metamatter micro-crystals of MSP, MSD, and MSH.

I can supply a large amount of written technical material to anyone who is interested in raising the $150,000 seed capital required to get Metamatter Industries off the ground (and for me to file the pioneering Patent Applications, and since I am now licensed to practice Intellectual Property Law before the PTO I can do it myself at no extra expense – as did the physicist/patent-attorney who invented the Xerox process).

This will be BETTER than getting in on the ground floor of Xerox or Polaroid or Microsoft!

Sincerely,

Robert W. Bass, M.A. Oxon, Ph.D.
Dr. Robert W. Bass, Registered Patent Agent 29,130 [ex-Prof Physics]
Inventor: Topolotron, Plasmasphere, issued; QRT Cold Fusion, pending
P.O.Box 1238, Pahrump, NV 89041-1238; phone/FAX (702) 751-0932/0739
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XXX.YYY
XXX Venture Partners

Dear XXX,
Have you got your _____ Fund off the ground yet? Did you receive the Proposal I sent you last week?

Do you agree that the logic of the Analogy I used for the proposed Low-Risk, AWESOME Payoff, "Proof-of-Principle" (POP) Experiment is sound? If a rational Investor were convinced (e.g. by the photos published by Nitro-Nobel Medalist, Melvin Cook) that it is possible to put a plasma in the state of liquid metal (Liquid Metallic Plasmoids, or LMPs), and that the ONLY risk is that when cooled to room temperature they will not yet crystallize [but won't crystallize until down below, e.g.. the temperature of liquid nitrogen], which risk will be taken by OPM [Other People's Money] when the scientific community realizes that LMPs can be created at will, and that there is ZERO risk in performing the proof-of-principle demonstration experiment to convince them of this fact, and that this can be done for as little as $150,000 (which will also permit Patent Applications ensuring the inside track when LMPs get crystallized), don't you agree that the Reward to Risk Ratio of $3 X 10^[10]/$1.5 X 10^[5] = 2 X 10^[5] multiplied by the probability of crystallization at room temperature (which is supported by hundreds of theoretical papers on MSH and at least one recent paper in Physical Review Lettersw on MSP, as much, much better than 50%), namely an EXPECTED REWARD/RISK RATIO of more than 100,000-to-1 implies that this Proposal is "better" than any proposal made in this field yet, when you note that each of the 3 main products to be manufactured from crystallized LMPs, namely MSP, MSD, and MSH, EACH separately addresses a different Trillion-Dollar Market with a clear Profit Potential of more than $10 Billion?

Moreover, this is a Proposal in which the Investor who RISKS $150K will know within a mere 6 or 7 months WHETHER OR NOT Phase One of his speculation has paid off! (And it is highly likely that the Absolute Answer will be known within another 3 months, considering how fast the scientific community reacts to something, e.g. High-Temperature Superconductors, which is both surprising and EASY to replicate!)

Please tell me when a Speculative Investment Possibility better than this one has last crossed your desk? (I'll bet, NEVER!)

Regards,

Bob Bass

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Electrino Fusion Power Reactor

Gordon L. Ziegler has discovered how to make a clean electrino fusion power reactor capable of generating up to a net of 1880 megawatts of DC electricity. The proposed energy source would produce no carbon emissions and no radioactive wastes. (By reversing the order-to-disorder arrow in the second law of thermodynamics, a $50,000,000 electrino fusion power reactor could be built which would also reverse all aging, disease, and decay processes within a one-mile radius.)

Power output, however, cannot occur in this system without the simultaneous operation of two aspects of the invention. One is an accelerator-collider making a field reversing the order-to-disorder arrow in the second law of thermodynamics in a controlled area. Among other things, that field makes the other aspect of the system (the power source) efficient enough to be self-sustaining and prevents the formation of radioactive wastes.

Electrons are generally regarded to be structure-less spinning point charges. But that contradicts a reasonable postulate that occurred to Gordon L. Ziegler in 1967: “A spherically or cylindrically symmetric smooth charge distribution cannot have detectable spin.” Electrons have detectable spins. Therefore they must not have smooth structure-less symmetric charge distributions. They must be lumpy and have internal structure. An application of the Parsimony Principle shows that they must be composed of two half-charges orbiting each other at the speed of light. The reason scientists concluded that the electron was structure-less was that it could not be blasted apart in collisions up to 700 MeV each particle.

But in Ziegler’s model, electron sub-particles are bound together by confinement by a speed of light barrier (they are trapped going faster than the speed of light). They cannot be blasted apart, even though they are two particles.

The two sub-particles of electrons make a whole different structure for matter than quarks and leptons. The sub-particles can also fuse with each other – making new particles. Fusing sub-particles of positrons reverses the order-to-disorder arrow in the second law of thermodynamics – making the power source efficient enough to be self-sustaining and preventing the radioactive wastes from forming. Fusing the sub-particles of electrons comprise the power source.

Key components include a polarized positron source, injector accelerators, inflection magnets, end magnets, and the beam transport.

Governments and utilities would buy electrino fusion power reactors because the process is a clean, inexpensive way to produce electricity. It is 1000 times as efficient as nuclear reactors. It does not require uranium or plutonium for fuel. It can run on anything for fuel such as dirt, sand, sewage, ground garbage, toxic chemicals, radioactive wastes, sea water, etc. without carbon nor radioactive pollutants.

Assume that the collision energy were 940 MeV to avoid unwanted heat (operate at room temperature), and the current in each beam was 1.0 ampere of electrons. The energy investment into the electrino fusion would be 1880 megawatts. The energy released in annihilation photons would be 3760 megawatts. Recoverable net power would be 1880 megawatts or less.

The collision energy of the linear accelerator would be 940 Mev (each particle – 1880 MeV in the center of mass frame). The current in each beam would be 1.0 amperes of electrons. There would be two beams 180 degrees from each other.

The energy released in annihilation photons would be 3760 megawatts. "Annihilation photons" are the 940 MeV X-Rays produced when a negatron annihilates a proton. These X-rays are converted to electricity by order-to-disorder arrow reversed photo-voltaic cells with nearly 100% efficiency.

In summary the 3760 megawatts output of annihilation photons would be converted to electricity. However, in order to keep the electrino fusion reaction going, 1880 megawatts would be taken from the 3760 megawatts to power the linear accelerator. The net energy output would thus be 1880 megawatts-electric.

The size of an electrino fusion reactor would be about 80 ' x 10' x 10'. The fuel is whatever brass or copper James M. Potter uses in constructing the walls of his linear accelerators. James M. Potter, Ph.D., is President, JP Accelerator Works, Inc., 2245 47th Street, Los Alamos, NM 87544, 505-690-8701 or 888-301-2833 or 505-661-8155, jpotter@jpaw.com, http://www.jpaw.com. 155 lbs of

brass would be consumed over 100 years before shutdown for refueling. The linear accelerator would be a standard commercially available model. It would not need to be customized for an electrino fusion reactor.

The smallest electrino fusion reactor that would be possible to build is now about 80' x 10' x 10'. It may eventually be the size of a filing cabinet.

The projected cost of the first 1880-megawatt electrino fusion reactor is approximately $100 million. This clean source of electricity could be built in two years, and the necessary Refresher built in one year. Electricity could be generated for only about 1.5 percent of current rates (a little over 0.1 cent per kwh). Subsequent clean energy sources can be built for $37.5 million each.

The 1880 megawatts (net) of electricity generated by an electrino fusion power reactor would be Direct Current (DC). A utility would need thick wires and the biggest busbars and transformers on the planet. Conversion from DC to Alternating Current (AC) would require the world's largest inverters.

The electrino fusion reactor requires the Refresher to be self-sustaining. But the Refresher has several positive medical side effects due to reversing the order-to-disorder arrow that cannot be eliminated – in a controlled area reverse adult aging and wipe out diseases.

Refresher 1
Design Specifications

Size of accelerator	20 meters long by 3 meters wide
Diameter of channels	4 cm (maybe a little more to allow for water cooling channels)
Type of accelerator	Folded linear accelerator with pulsed klystron RF power supplies and S-band cavities (2856 MHz)
RF power supplies	Eight 35 to 50-megawatt pulsed klystrons
duty factor	0.1% (peak current 1000 times average current)
Average power	400 kW (20 kW per meter of accelerator)
klystron efficiency	~50%
total system power	800 kW
cooling water requirement for each 5 m section	5 to 10 gpm

cooling water required by each klystron	~ 5 gpm
cooling towers capacity	800 kW

Cost:

Linear accelerator	$12 million
Klystrons	$ 8 million
Klystron power supplies and cooling towers	$ 2 million
Magnets and their power supplies	$ 2 million
System with controls	$ 8 million
10% contingency	$ 3.2 million
Builder's cost	$35.2 million
Other budgeted items	$14.8 million
Total budgeted	$50 million

Creation time total	3 years
Design time (beam dynamics, rf power systems, cooling, and computer control)	1 year
Fabrication and subassembly testing	18 months
Installation and commissioning	6 months

(The following chapter is taken from *Formulating the Universe*, Volume II, by Gordon Ziegler, Chapter 7. Copyrighted by Benevolent Enterprises 2004. Used with permission.)

Chapter 7

SECOND LAW OF THERMODYNAMICS

A. Introduction

Everything goes from a state of order to more disorder. Brand new automobiles wear out and rust. Objects break or are damaged. A thermos bottle falls off the counter, and the inner glass bottle is shattered. We do not expect the shattered bottle to fall back up to the counter and become whole again. There is a one-way arrow for the events to transpire. That arrow is the Second Law of Thermodynamics.

Houses grow old and fall into decay. Barns fall down. Fruit spoils, people and animals grow old and die. Viruses mutate. People become ill and die. Crime and disorder in society increase. Homes break up. Aborted fetuses disintegrate. Dead people and things decompose. All of these negative occurrences are the outworking of the second law of thermodynamics – that part of which is an arrow making everything go from order to disorder.

Let us consider what other people have written about the second law of thermodynamics.

"Second law of thermodynamics

"An equilibrium macrostate of a system can be characterized by a quantity S (called *entropy*) which has the following properties:

"(i) In any infinitesimal quasi-static process in which the system absorbs heat dQ, its entropy changes by an amount

$$dS = \frac{dQ}{T} \qquad (7\text{-}1)$$

where T is a parameter characteristic of the macrostate of the system and is called its *absolute temperature*.

"(ii) In any process in which a thermally isolated system changes from one macrostate to another, its entropy tends to increase, i.e.,

$$\Delta S \geq 0. \qquad (7\text{-}2)$$

"The relation (7-1) is important because it allows one to determine entropy *differences* by measurements of absorbed heat and because it serves to characterize the absolute temperature T of a system. The relation (7-2) is significant because it specifies the direction in which nonequilibrium situations tend to proceed."[1]

The above expression of the second law of thermodynamics is regarding entropy and heat. Other writers include the order-to-disorder arrow in the second law of thermodynamics.

"It is a matter of common experience that disorder will tend to increase if things are left to themselves. (One has only to stop making repairs around the house to see that!) One can create order out of disorder (for example, one can paint the house), but that requires expenditure of effort or energy and so decreases the amount of ordered energy available.

"A precise statement of this idea is known as the second law of thermodynamics. It states that the entropy of an isolated system always increases, and that when two systems are joined together, the entropy of the combined system is greater than the sum of the entropies of the individual systems. For example, consider a system of gas molecules in a box. The higher the temperature of the gas, the faster the molecules move, and so the more frequently and harder they collide with the walls of the box and the greater the outward pressure they exert on the walls. Suppose that initially the molecules are all confined to the left-hand side of the box by a partition. If the partition is then removed, the molecules will tend to spread out and occupy both halves of the box. At some later time they could, by chance, all be in the right half or back in the left half, but it is overwhelmingly more probable that there will be roughly equal numbers in the two halves. Such a state is less ordered, or more disordered, than the original state in which all the molecules were in one half. One therefore says that the entropy of the gas has gone up. Similarly, suppose one starts with two boxes, one containing oxygen molecules and the other containing nitrogen molecules. If one joins the boxes together and removes the intervening wall, the oxygen and nitrogen molecules will start to mix. At a later time the most probable state would be a fairly uniform mixture of oxygen and nitrogen molecules throughout the two boxes. This state would be less ordered, and hence have more entropy, than the initial state of two separate boxes."[2]

"The explanation that is usually given as to why we don't see broken cups gathering themselves together off the floor and jumping back onto the table is that it is forbidden by the second law of thermodynamics. This says that in any closed system disorder, or entropy, always increases with

time. In other words, it is a form of Murphy's law: Things always tend to go wrong! An intact cup on the table is a state of high order, but a broken cup on the floor is a disordered state. One can go readily from the cup on the table in the past to the broken cup on the floor in the future, but not the other way round.

"The increase of disorder or entropy with time is one example of what is called an arrow of time, something that distinguishes the past from the future, giving a direction to time."[3]

B. Electrino Model and 2nd Law

The natural tendency of leptons in beta decay is that the parent lepton combines with one or more gravitons to produce more particles. In all natural reactions, the order energy of the resultant particles is less than or equal to the order energy of the original particles.

1. Negative Energies. Let us consider antimatter more carefully. "In the Dirac theory also, *the permissible energy values for a free particle range from $+mc^2$ to + 4 and from $-mc^2$ to - 4.* The first of these results is of course just what we expect for a free particle – that its total energy can have any value greater than its rest energy. But the second result is quite puzzling, since it implies the existence of states of *negative total energy.*"[4] Anderson in 1932 discovered positrons in cosmic radiation. These were regarded as Dirac's negative energy particles. "The first two solutions of the Dirac equation . . . clearly describe a free electron of energy E and momentum **p**. The two negative energy electron solutions . . . are to be associated with the antiparticle, the positron."[5]

However, in the annihilation it is not $(+mc^2) + (-mc^2) = 0$, but $2mc^2$ is the result of annihilation.[6] There is something strange going on with the minus signs in these equations. The calculations are inconsistent.

Maybe there are two kinds of energy considered. One we can call entropy energy E_S. In the annihilation reaction, $\#+mc^2\# + \#-mc^2\# = 2mc^2$. Entropy energy is the higher value. The other energy is order energy E_O. In order energy the same reaction is $(+mc^2) + (-mc^2) = 0$.

Let us consider entropy energy and order energy for particle decay schemes. There are a few decay schemes where no negative order energy (anti-matter) is introduced in the right hand side of the decay schemes. In those few instances, the final order energy is equal to the initial order energy (when kinetic energy is taken into account). But in most cases, a trace of negative order energy (anti-matter) is introduced into the right side of the decay schemes. There is nothing on the left hand sides of the decay schemes to correspond to this addition of a trace of negative order energy on the right sides of the decay schemes. Therefore, total order energy is less on the right hand sides of the decay schemes than on the left hand sides (if only by a trace). A few decay schemes introduce a lot of antimatter (as K^-) on the right side of the decay scheme. The loss of order energy in the systems is greater in those cases. But in every case, for all natural processes, the order energy final is # the order energy initial, or

$$\Delta E_0 \leq 0. \qquad (7\text{-}3)$$

Let us check the order energy for electron electrino fusion reactions. Electrons made energetic by acceleration (as heavy as protons) fuse and form anti-protons. Matter is converted to anti-matter. Entropy energy is conserved, but not so order energy. Order energy is reduced in the extreme from +938 MeV to -938 MeV or more for each electron fused (two electrons are fused in each reaction).

The order-to-disorder arrow for electron electrino fusion points in the usual direction. The system does obey the second law of thermodynamics.

2. Reversing the Order-to-Disorder Arrow. What would happen if we fused the electrino constituents of positrons instead of the electrino constituents of electrons? Entropy energy E_S would again be conserved. Entropy would be increased. However, order energy E_O would go from -2 x 938 MeV to +2 x 938 MeV – from disorder to order. The order-to-disorder arrow would be reversed. This would be a reaction that would be prohibited by the second law of thermodynamics – unless the strong gravitational force that fuses the anti-semions would be stronger than the second law of thermodynamics (which otherwise governs weak interactions). The stronger of the strong gravitational force and the second law of thermodynamics should be determined by experiment. More rides on that one experiment than perhaps on any one other experiment in this generation. If it is found that strong gravity is stronger than the second law of thermodynamics, then order can be restored at first in a small area, and then for the whole earth.

Here we see that the entropy arrow of time and the order-to-disorder arrow of time are separate and distinct, and are not one and the same thing. While all the reactions the author has studied increase entropy, the fusion of positron anti-semions reverses the order-to-disorder arrow, making more order out of the disorder.

Positron constituent electrino fusion might not only take the electrinos from disorder to order. It could make other physical processes in a local area go from disorder to order. The positron fusion not only violates the second law of thermodynamics, it reverses the order-to-disorder arrow of that law in a local area, making other processes in that area reverse. Let us consider that process more to see how it might be regulated.

We guess the desired relationships for reversing the order-to-disorder arrow in the second law of thermodynamics through dimensional analysis. We want to solve for r, the maximum radius in which the reversed law would be effective. There is a way we can obtain a length from combinations of our variables and constants. That way is in the right hand side of Eq. (7-4). The whole expression is the thermodynamic relation we are seeking. The thermodynamic relation is:

$$(\Delta E_o)_t > 0 \ \textit{where} \ r < \frac{(\Delta E_o)_1 \ c}{ik}, \qquad (7\text{-}4)$$

where E_o is the order energy – the positive or negative energy in the pair production of particles; ΔE_o is the change in the order energy, where $(\Delta E_o)_t$ is the change in the total order energy of the system, and where $(\Delta E_o)_1$ is the change in the order energy for a single source reaction – for a positron fusion reaction it is approximately 2 x 10^9 eV/collision x 1.6 x 10^{-19} joules/eV = 3.2 x 10^{-10} joules/collision; c is the speed of light – approximately 3.0 x 10^8 m/s; we shall solve for the effected radius r; i is the beam current in each beam in Coulombs per second (we will solve for 10^{-11}); k is the ratio of particle energy to particle charge. This energy per charge is the accelerated energy of the particle (roughly 1 x 10^9 ev times 1.6 x 10^{-19} joules/ev = 1.6 x 10^{-10} joules) divided by the charge of each positron (q = 1.6 x 10^{-19} coulombs), which equals 10^9 joules per coulomb. The collision efficiency eff is not needed in this equation, because the result is not in particles, but is already in collisions.

Incredibly, the lower the current, the bigger is the radius of the affected area. The greater the current, the smaller is the radius of the effected area. With 10^{-11} A beam currents, the effected

radius r solves for 9.6 meters – roughly 10 meters, which describes a small area – less than a tenth of an acre.

To get an idea of the positron beam currents needed to reverse the order-to-disorder arrow of the second law of thermodynamics in what size of affected radius, see Table 7-1 below.

For an area the size of	r	beam current
House	10 m	10 pA
four football fields	100 m	1 pA
community	1 km	100 fA
city	10 km	10 fA
Israel	160 km	0.6 fA
U.S.	2,400 km	0.04 fA
World	13,000 km	0.008 fA
Sun	1.7E11 m	6E-22 A

Table 7-1. Beam currents versus affected radius for reversal of the order-to-disorder arrow of the second law of thermodynamics.

We must make sure that reversing the second law will do only good and not evil before we flip the switch. Inspired evidences will be studied in the next chapter on a wide range of phenomena affected by reversing the order-to-disorder arrow in the second law of thermodynamics.

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[1]F. Reif, *Statistical Physics*, Berkeley Physics Course--Volume 5 (New York: McGraw-Hill Book Company, 1967), p. 283.

[2]Stephen Hawking, *A Brief History of Time*--From the Big Bang to Black Holes (New York: Bantam Books, 1988), pp. 102, 103.

[3]*Ibid.*, pp. 144, 145.

[4]Robert B. Leighton, *Principles of Modern Physics* (New York: McGraw-Hill Book Company, Inc, 1959), p. 665.

[5]Francis Halzen, Alan D. Martin, *Quarks and Leptons* (New York: John Wiley & Sons, 1984), p. 107.

[6]David S. Saxon, *Elementary Quantum Mechanics* (San Francisco: Holden-Day, 1968), p. 386.

(End of Chapter 7)

EXECUTIVE SUMMARY OF BUSINESS PLAN

electrino energy is a new company formed to develop the inventions envisioned by the new model of physics—the electrino fusion model of elementary particles. Our company provides theoretical work and guidance to licensees. Our focus is the reverser of aging, disease, and decay processes (Refresher 1) and whatever else we must do to fund the Refresher 1.

electrino energy was formed October 12, 2005 as an invention development and theorist service specializing in four high-technology inventions – inertia-less craft; artificial gravities; reverser of aging, disease, and decay processes; and electrino fusion reactors generating electricity. All four inventions have potentially extremely high value. But all four inventions currently have three principle difficulties: 1) they are unbelievable by almost all persons – including agency heads, venture capitalists, congressmen and senators; 2) almost all of them cost scores of millions of dollars to develop; and 3) **electrino energy** has no money to develop them. With no capital and no revenue stream or other assets to fall back on, **electrino energy** cannot even get a guaranteed loan.

But **electrino energy** is not resource-less and in a hopeless condition. It has three principal approaches that it can take to resolve this dilemma:

1) Though the aging reverser is the most urgently needed, a miniature inertia-less craft can be constructed for a whole lot less money. It should be possible to construct one for a few hundred dollars borrowed from friends. But that technology could be licensed for hundreds of millions of dollars – enough to finance all the four high-tech inventions.

2) As a back-up to that approach, venture capital angels could be approached to advance the money to finance the reverser of aging, disease, and decay processes. This invention is not only high tech, but medical. The other inventions could be developed at a later time.

3) As a back-up to that approach, the owner could pursue his particle theory, predicting the masses of particles. That may be difficult, but not impossible. This would do what no other physical theory can do. Such a feat would be publishable, arousing interest among scientists for creating a facility to test the model – opening the way for government funding of the high-tech inventions.

A master decision tree flow chart linking and employing these three alternatives for funding the development of the inventions is in Section 7.0 Financial Plan.

According to alternative 1), projected sales and profits for the first four years of operation are summarized below:

Year	Sales($)	Profits($)	Profit/Sales(%)
1	200,000,000	0	0
2	0	0	0
3	0	0	0
4	10,000,000,000	9,000,000,000	90.0

According to alternative 2), there are no actual projected sales and profits for the first three years of operation. Year four is the same as above. According to alternative 3), there are no projected sales or profits for the first five years.

Currently, there are no competitors for any of these inventions. Once public incredulity is overcome by demonstration, the devices should have huge market potential.

The size of the electricity generating market is essentially enormous. It would be up to 50 percent of electric generation world-wide eventually. That's probably over a trillion dollars.

A self-powered high-speed locomotive powered by an electrino fusion power reactor would need to be at least 85 feet long.

Environmental Heat Engines

Las Vegas inventor Robert Stewart developed his "Stewart Cycle" engine for transportation vehicles, electricity generators, and large-scale water lifters. His efficient and pollution-free engine uses ambient heat to expand a working fluid such as Freon or ammonia and move pistons through sealed chambers. His patent is for Vapor Actuated Power Generating Device, No. 4,033,136.

A possibly more up-to-date version is Ralph J. Lagow's Method of Generating Power from a Vapor, Patent No. 4,693,087. Ken Rauen's Rauen cycle and Superclassical cycle engines also expand working fluids with environmental heat to provide useful net mechanical power.

Mr. Stewart claimed that his fuel-less engine could lift Colorado River water from below Hoover Dam back up into Lake Mead, thereby doubling Hoover Dam's output of electricity. He also proposed lifting water from the Columbia River into the Colorado River via a canal, generating electricity as the water flowed back downhill.

Thank you for your comment, Gary Vesperman.

The comment tracking number that has been assigned to your comment is SEDDsupp20014.

Comment Date: December 1, 2011 22:03:04PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20014

First Name: Gary
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Zip: 890051018
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Locomotive_Power_Sources.docx

Comment Submitted:

Attached is my compilation of candidate power sources for high-speed rail locomotives. It is available in my website www.padrak.com/vesperman. Pages 28-33 has this description of metamatter:

Metamatter

9/25/1997 11:16 AM
From: Robert Bass
To: James Bowery
jabowery@netcom.com;
CC: Robert W. Bass rbrtbass@pahrump.com;
Gary Vesperman
vman@skylink.net;
Subject: for the postulated "Bass page"?

Jim,

I just went to http://www.generalstore.com/ and see nothing but "under construction, etc." Is this you, or someone else in another state? Do you know how to (reasonably economically) do Mass-eMailings? Say either from a rented Data Base of known Investors, or just blindly to "millions"?

How about posting the following

Potentially Awesome Speculative Investment Opportunity?
==========
Venture SEED Capital? Low Risk, AWESOME Payback!!!

I seek one or more High-Technology-Oriented "High-Roller" Nerves Investor(s) who would be intrigued by the following proposition (if demonstrably sound and absolutely genuine): Suppose you go to "Super Monte-Carlo" in the sovereign nation of Erehwon, and you come to a table with a Croupier who says:

"I have here a coin the size of a U.S. silver dollar, which is perfectly evenly balanced between Heads and Tails to 10 decimal places [with the edge for Heads in the 11th decimal place]; and a certificate from the US Bureau of Standards certifying it is not "loaded" to favor either Heads or Tails to the best measurements they can make.

"You can flip the coin yourself.

"I have here Certificates of Deposit for $30 Billion in a centuries-old Swiss Bank of spotless reputation.

"My croupier's fee for allowing you to play is ridiculously modest.

"How much are you willing to wager on the honest flip?

"Now suppose the preceding scenario is repeated, except that several of the most reputable scientists in the world assure you that the coin is 'loaded' so that the chances of Heads are between 95% and 99%. Your own experts assure you that you have at worst One Chance in 20 of losing.

"Finally, the croupier says, you may play for $150,000."

To recapitulate, the odds are 20-to-1 that you will win $30 Billion, versus one chance in 20 that your entire $150,000 wager will be lost.

Would you play?

==========
-------PRIVATE Communication-----
------(NOT a Publication)--------
==========

I need Seed Capital of $150,000 under circumstances exactly analagous to those outlined in the Risk/Reward scenario above. If "Heads" comes up, then my patented Plasmasphere technology can be escalated to a Metamatter technology, where by METAMATTER I mean a solid, crystallized fully-ionized plasma.

An ordinary crystal has nuclei spaced apart distances of about 10^[-8] cm, the Bohr radius, because the electron cloud makes the atoms behave like little billiard balls of the size indicated.

However, in a plasma, the positively-charge nuclei and the electrons are equal in number, but the electrons are not in orbit around individual nuclei; they are "mixed up" as in a plum-pudding. Most plasma physicists will tell you that in order for hydrogen gas to be fully ionized (i.e., all electrons stripped from all nuclei) the temperature of the gas would have to be above 150,000 degrees Kelvin (i.e., 15 times hotter than the surface of the Sun). But this is demonstrably FALSE (both theoretically and experimentally). If the gas is dense enough, it can be fully ionized at "low" temperatures, e.g. 5000 Kelvins [so-called "pressure ionization"].

Now suppose that the fully ionized low-temperature gas is condensed into the physical state of a liquid metal. I call this a Liquid Metallic Plasmoid (LMP). The characteristic of an LMP is that, like mercury, it keeps a constant volume; unlike a gas, it does not expand to fill all available space (if in a vacuum). The positive nuclei remain on average equidistant, and the electrons circulate around the dynamic lattice as in a giant crystalline molecule. Cook called it a "Cryscapade"; whereas others might call it a Liquid Crystal.

Fewer than a score people in the world understand that LMPs can exist. One LMP was photographed in half a dozen or so photos on the cover of the Journal of Applied Physics in 1957 by [later] Nitro-Nobel Medalist, physical chemist, Dr. Melvin Cook. The theory by which Cook explained his accidental discovery has been independently rediscovered (in 3 separate countries, USA, UK & France) by researchers seeking to explain the illusive natural phenomenon of Ball Lighting.

The late expert on High-Energy Lasers and Shock Tubes, Dr. Jay Blauer of Rockwell Rocketdyne, who died early of leukemia, helped me to design an experiment that would prove beyond shadow of a doubt that LMPs can be created at will. The basic idea is to use a combination of Shock Tube technology and High-Energy Laser technology, with my patented Plasmasphere technology, in order to achieve in a non-self-destructive, reusable device, what Cook discovered accidentally with high-explosives in a self-destructive experiment.

Once the mere EXISTENCE of producible-at-will LMPs is achieved (for the Risk Capital of $150K), it will be trivially easy to raise several million more for refinement of the device to move the LMP into a cryogenic vacuum chamber where (since it is electrically conductive) it can be magnetically levitated and allowed to cool by radiation.

Use of the Brush-Sahlin-Teller Equation of State (used to design the H-bomb) shows that as the LMP cools, its volume contracts, and it becomes more and more dense. There can be shown to scientists sufficiently expert to understand the evidence, a mass of recent experimental evidence (as well as expert theoretical evidence) that before the LMP gets down to room temperature it will crystallize into a Metastable Solid Crystal, namely a new form of matter never seen before on Earth!!!

The density will be intermediate between that of ordinary condensed matter and that of neutron stars, wherein a teaspoonful weighs tons.

I propose to manufacture 3 kinds of Micro-Crystals of Metamatter: MSP, MSD, and MSD. Each addresses in a truly revolutionary way a trillion-dollar market, with a multi-billion dollar profit potential. In many ways, Metamatter will have a bigger impact on human civilization than any prior discovery, including both computers and atomic energy! In fact, consider the following:

MSP (Meta-Stable Protium [hydrogen]) will be the IDEAL room-temperature Superconductor, which will revolutionized both the Computer/Electronics industry and the Electric Power industry.

MSD (Meta-Stable Deuterium [heavy-hydrogen]) will be the ideal 5th Generation Cold Fusion fuel; when triggered by an infra-red photon of 17.7 eV, a micro-pellet will undergo a phonon-mediated and Lattice-Catalyzed ANEUTRONIC chain-fusion reaction to cleanly release the energy of 10 sticks of dynamite, to make steam for mechanical heat and conversion at 67% efficiency into electrical energy. This can make both homes and automobiles independent of the present electrical utility companies, though they will still need to buy the almost dirt-cheap MSD fuel micro-pellets from Metamatter Industries.

MSH (Meta-Stable Helium) will be the IDEAL rocket propellant for expanding human civilization into the Solar System (e.g. to colonize Mars); when a micro-crystal of MSH is triggered by the right frequency of laser-light, it will return to the form of gas as if it had been compressed by tens of millions of atmospheres of pressure; it will release 43 times more energy per unit weight than any conceivable chemical combination!

During the mid 1980s, the Air Force Systems Command sent a group of 7 or 8 Colonels who held Doctorates in the physical or engineering sciences to scour the USA for 9 months, in groups of 2 or 3, and to report back on what futuristic technology would have the greatest potential impact on the USAF and USA economy by the year 2000 if reduced to actual practice. They listened to 600 industrial and academic presentations and selected MSH as the greatest payoff (for least risk) choice! The USAF Rocket Propulsion Lab was supposed to issue 8 parallel contracts for 8 "crash" projects to see if bulk MSH could be manufactured. I was slated to get one of the 8 contracts, but my approach (through solidifying a helium LMP) was radically different from that of the other 7 selected proposers.

With MSH as fuel, one could take a 50 percent payload to Mars and back in two weeks! (Accelerate there and return at one gee.)

But a Princeton professor of Physics, Will Happer, then Secretary of the JASONS [advisers to DOD/DOE], advanced theoretical arguments which appeared to shoot down the practicality of the other 7 approaches, and the whole project was canceled. But Happer's arguments are totally irrelevant to my approach. Moreover, Happer was later Chief Scientific Advisor to Admiral Watkins (Secretary of DOE) when the ERAB Report was produced.

Those who understand the recent work of Arata and Zhang in which the aneutronic conversion of deuterium nuclei to helium nuclei inside of a palladium lattice is recorded in Real Time (inside of a sealed apparatus which contains a Mass-Spectrometer and which give ZERO helium when the heavy-water deuterium is replaced by ordinary-water hydrogen) know that Aneutronic Cold Fusion (CF) is a demonstrable FACT and that Happer and the ERAB Report were WRONG. Therefore it is logical to consider the possibility that Happer was also wrong when, before he shot down CF, he also shot down MSH.

There is ZERO risk in producing an LMP; it is just that 99.999% of all scientists are ignorant of Cook's work.

There is a slight technical risk in crystallizing an LMP at room-temperature; conceivably, it will remain liquid until below the temperature of liquid nitrogen, in which case my proposal will have been a failure. But the payoff is so AWESOME, and the chances of failure so tiny, that the risk seems worth taking.

I can supply drawings of the Proof-of-Principle Process Prototype Plasmasphere demonstration designed by Dr. Blauer and myself. Jay Blauer told me that he could do the experiment in his spare time evenings and weekends "in two weeks" using shock-tube and laser equipment already in his lab at Rocketdyne, provided he had $10,000 cash for items and materials not on hand.

Several "reputable" labs have explained to me that they would not even consider bidding on doing the Bass-Blauer experiment for less than $100,000. I have personal contacts at 22 government and private labs (such as JPL, SRI, LANL, etc.) which I would like to visit with my former graduate student Dr. Lou Puls (who, unlike me, is an accomplished experimental plasma physicist) to make joint presentations on the theoretical and experimental aspects of creation of an LMP, preparatory to asking them to bid. After 22 weeks spent in such visits, (and paying Dr. Puls Consulting Fees) I expect to have $50,000 left to offer the Highest Bidder. I also expect that no one will bid less than $100,000. But I also expect that out of the 22 presentations, at least several will become so excited that they will offer to Cost Share. In several labs, the working-level scientists interested in LMPs have told me, "If you can get the Management to pay attention, we have in place already a mechanism and a precedent to Cost Share."

Remembering what happened to Fleischmann and Pons it will accomplish naught for me to take the $150K, rent the equipment, and do it in my own garage. Nobody will believe it, and nobody will pay any attention. However, if we spend 6 months getting suitable technical personnel of nationally reputable laboratories excited about the subject of LMPs, and then some lab with the prestige of, say, JPL or LANL or SRI, announces the production of an LMP, many other labs will immediately undertake to "catch up" and to replicate the result at their own expense. Once 3 or 4 labs have announced successful replication, no one will doubt and then it will be trivially easy to raise the venture capital to go from LMPs to solid, crystallized Metamatter micro-crystals of MSP, MSD, and MSH.

I can supply a large amount of written technical material to anyone who is interested in raising the $150,000 seed capital required to get Metamatter Industries off the ground (and for me to file the pioneering Patent Applications, and since I am now licensed to practice Intellectual Property Law before the PTO I can do it myself at no extra expense – as did the physicist/patent-attorney who

invented the Xerox process).

This will be BETTER than getting in on the ground floor of Xerox or Polaroid or Microsoft!

Sincerely,

Robert W. Bass, M.A. Oxon, Ph.D.
Dr. Robert W. Bass, Registered Patent Agent 29,130 [ex-Prof Physics]
Inventor: Topolotron, Plasmasphere, issued; QRT Cold Fusion, pending
P.O.Box 1238, Pahrump, NV 89041-1238; phone/FAX (702) 751-0932/0739
Voice-Mail: (702) 387-7213 e-Mail: rbrtbass@pahrump.com

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XXX.YYY
XXX Venture Partners

Dear XXX,
Have you got your _____ Fund off the ground yet? Did you receive the Proposal I sent you last week?
Do you agree that the logic of the Analogy I used for the proposed Low-Risk, AWESOME Payoff, "Proof-of-Principle" (POP) Experiment is sound? If a rational Investor were convinced (e.g. by the photos published by Nitro-Nobel Medalist, Melvin Cook) that it is possible to put a plasma in the state of liquid metal (Liquid Metallic Plasmoids, or LMPs), and that the ONLY risk is that when cooled to room temperature they will not yet crystallize [but won't crystallize until down below, e.g.. the temperature of liquid nitrogen], which risk will be taken by OPM [Other People's Money] when the scientific community realizes that LMPs can be created at will, and that there is ZERO risk in performing the proof-of-principle demonstration experiment to convince them of this fact, and that this can be done for as little as $150,000 (which will also permit Patent Applications ensuring the inside track when LMPs get crystallized), don't you agree that the Reward to Risk Ratio of $3 X 10^[10]/$1.5 X 10^[5] = 2 X 10^[5] multiplied by the probability of crystallization at room temperature (which is supported by hundreds of theoretical papers on MSH and at least one recent paper in Physical Review Lettersw on MSP, as much, much better than 50%), namely an EXPECTED REWARD/RISK RATIO of more than 100,000-to-1 implies that this Proposal is "better" than any proposal made in this field yet, when you note that each of the 3 main products to be manufactured from crystallized LMPs, namely MSP, MSD, and MSH, EACH separately addresses a different Trillion-Dollar Market with a clear Profit Potential of more than $10 Billion?

Moreover, this is a Proposal in which the Investor who RISKS $150K will know within a mere 6 or 7 months WHETHER OR NOT Phase One of his speculation has paid off! (And it is highly likely that the Absolute Answer will be known within another 3 months, considering how fast the scientific community reacts to something, e.g. High-Temperature Superconductors, which is both surprising and EASY to replicate!)

Please tell me when a Speculative Investment Possibility better than this one has last crossed your desk? (I'll bet, NEVER!)

Regards,

Bob Bass

Dr. Robert W. Bass, Registered Patent Agent 29,130 [ex-Prof Physics]
Inventor: Topolotron, Plasmasphere, issued; QRT Cold Fusion, pending
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(End of excerpt)

This Draft Solar PEIS should thoroughly and honestly compare the cost-effectiveness of a World War II Manhattan Project-styled crash program to quickly develop and commercialize energy inventions based on the above versions of metamatter.

(If you have difficulty contacting Dr. Bass, email me, Gary Vesperman, at garyvesperman@yahoo.com. He called me a few months ago from Dallas (?). What I have of his phone numbers are 817-682-2655, 817-377-7638, and 817-370-7109. I also have his current email address.)

Locomotive Power Sources

High-speed trains typically rely on some means of supplying energy to the locomotive from an external source. For example, cumbersome overhead electric lines are tapped to directly power a locomotive's electric drive wheels. Another method of connecting the locomotive to an electricity grid is with a dangerously exposed high-voltage third electrified rail. Linear magnetic propulsion mechanisms have been researched.

It would be much cheaper and easier to build and operate high-speed trains if their locomotives utilize an internal practically fuel-less power source.

The following candidate high-speed locomotive power sources appear worthy of further research. Some may be found to be worthwhile for building and testing prototype self-powered locomotives.

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BlackLight Power's Hydrino Generator

BlackLight Power, Inc., is developing an exotic new source of clean energy from ordinary water. Either an electrolytic cell or gaseous potassium ions in a vacuum compress hydrogen atoms into lower-energy-state hydrogen atoms called "hydrinos". When the hydrinos are formed, energy is released which in magnitude is between chemical and nuclear energy. BlackLight Power, Inc., has ambitious plans for retrofitting fossil-fueled and nuclear power plants.

BlackLight Power, Inc., is developing a 100-kilowatt generator which can power a car 100,000 miles on a tank of water. BlackLight Power, Inc., claimed some years ago that it is developing a 10-kilogram battery which can supply 150 horsepower for 1,000 miles.

BlackLight Power, Inc., has already licensed 8,250 megawatts of clean, safe hydrino generation fueled by water to seven utilities (Hoover Dam's nameplate capacity is 2,080 megawatts) – eliminating $2 billion/year in fuel costs.

Focus Fusion

See http://www.focusfusion.org/. Apparently this method is much less expensive than hot fusion.

Thorium PowerPack

Bob Dratch's thorium powerpack would generate electricity at approximately one-tenth of the cost of current methods of producing electricity. Thorium is sufficiently abundant that the entire planet can be powered for millennia. After ten years of continuous operation, a trace amount of U-233 is produced. U-233 recovery to re-purify the thorium is easily accomplished. Thorium thus lasts a long time when recycled and consequently is a very efficient energy source. After extraction from ore, thorium does not require energy-intensive enrichment as is the case with uranium.

A thorium-powered reactor is inherently safe. It doesn't run the risk of "meltdown" or explosion nor can even a dirty bomb be created. Its nuclear reaction simply stops when its neutron exciter is turned off.

The simplest and smallest "table top-sized " neutron exciter design is something close to the size of a 4-D cell flashlight, and starts at about 500-kilovolt neutron output. In fact this smallest most cost-effective system can run off 4 D cells for its power.

A thorium powerpack's neutron excitor does not use radioactive flux components as conventionally done for portable systems. Instead it relies on Dratch's invention of a novel method of resonant phonon pair cleavage using specifically designed nuclear lattice holo-forms (holographic waveforms) to induce neutron imbalance in a host atom where the host atom then attempts to establish "balance" through the liberation of neutrons. Dratch demonstrated the first model of this novel design back in 1966.

Commercial thorium powerpacks can be developed with 50 or 100 kilowatts of output for home use, and up to 1 megawatt for industrial use. They actually are "power amplifiers" with power outputs of 60 times over input power. Maintenance would be minimal.

IPMS Thorium-227 Electricity Generator

The I.N. Frantsevich Institute for Problems of Materials Science (IPMS), Kiev, Ukraine, from 1951 through 1991 secretly employed 6600 of the most brilliant theoretical physicists in the entire Soviet Union to work for nearly 50 years with complete freedom. They were able to develop whole new sciences, technologies and materials unknown in the West.

Their models of non-linear quantum mechanics, plasma physics, atomic engineering, nuclear physics and related mathematical and theoretical constructs, which made their development possible, are so unique that they challenge the validity of the most fundamental assumptions embodied in the Copenhagen Interpretation model currently held in general acceptance in the West.

For example, Western-developed particle/wave quantum mechanics is described by Einstein's $E = MC^2$. The Soviet nonlinear model of quantum mechanics is described by the formula $E = M_K v$ [Energy = Mass @ rest as a function of a mathematical constant].

Einstein's theory of relativity assumes that the speed of light is constant. However, measurements have shown that the speed of light has slowed down 7 per cent over the past two centuries. (See http://worldnetdaily.com/news/article.asp?ARTICLE ID=39733.) Einstein's famous equation is therefore not based on the real world of peer-reviewed experimental results. Consequently the more correct Soviet model has enabled numerous technical advances not even dreamed of by Western science.

Among several energy inventions developed by the IPMS are free-standing thorium-227 isotope electric power generating plants. They can be small enough to power a single home and large enough to power whole communities. They also can operate for up to 18 years without ever requiring refueling or maintenance.

Micro-Fusion Reactor Employing Stable High-Density Plasma Electron Spiral Toroids In Neutron Tube

Electron Power Systems, Inc., (EPS) has discovered the explanation for ball lightning and from that has invented and protected with five patents an Electron Spiral Toroid Spheromak micro-fusion reactor. Safe, pollution-free micro-fusion reactor-powered generators could reliably generate electricity with capacities ranging from 10 kilowatts through 1000 megawatts at the cost of 10% of today's electricity. All transportation vehicles could be reliably and safely powered with micro-fusion reactors with substantially lower production, operating and maintenance costs and without poisonous emissions. EPS expects to reduce the mass and cost of aircraft by 70%, and space launch costs by more than 95%.

Each year 15 million cars and trucks are sold in the USA, and 48 million are sold worldwide. EPS expects to eventually replace all of them with silent, reliable, safe, emissions-free micro-fusion reactor powered electric vehicles with substantially lower production, operating, and maintenance costs.

In addition, EPS has designed a 10kW generator that will operate on clean, non-polluting fuel, and can operate locally. This innovation will potentially improve the lives of most of humanity by making available low cost electricity that anyone can produce in their own homes. It will help literally billions of people. The paper design shows that the EPS generator will be the approximate

size and cost of a 10 kW generator available today in any hardware store, with the advantage that it will not use fossil fuels, but will use clean energy instead.

An article in the Institute of Electrical and Electronic Engineers, Inc., Spectrum magazine over ten years ago stated that world demand for electricity increases approximately 500 megawatts every day. To put this in perspective, the equivalent of another Hoover Dam would have to be built every four days to keep up with world electricity increase demands. The EPS innovation will make local generation possible without the need for more power plants or more power lines.

Major contributors to air and water pollution are the fossil-fueled engines of aircraft, farm harvesters and tractors, ships, boats, snowmobiles, trains, military vehicles, and all-terrain vehicles. Their engines could be replaced with cheaper electric motors and batteries charged by safe, non-polluting onboard micro-fusion reactor powered generators.

Electron Power Systems, Inc., (EPS) is an early stage company working to develop the Electron Spiral Toroid Spheromak micro-fusion reactor. From EPS will come new applications, including a practical micro-fusion electricity generator, a low-cost space launch vehicle, a high-kinetic energy anti-missile beam, and practical zero-emission cars, trucks, buses, farm equipment, construction equipment, military vehicles, and jet aircraft.

EPS is moving to commercialize these concepts. EPS has assembled a team of engineers, and plasma physicists, all as contractors. EPS is working on proof of concept demonstrations for the applications.

EPS plans to build a laboratory demonstration unit in two to three years with present funding levels, and then the first commercial prototype. Recent breakthroughs in the EPS lab give confidence this will happen within this timeframe. More funding will make this happen sooner.

EPS is seeking $2 million as a first round of investment to complete the development of a demonstration unit in eighteen months. A second investment of $8 million will be needed to complete a prototype unit in eighteen months after the demonstration unit.

Up until now EPS has had no sales and operates with funding from angel investors, each of whom is retired and has accumulated a substantial personal fortune, allowing these types of investments of high risk, high reward. EPS also operates with funding from the founder.

EPS operates on a low budget, spends only what it has, and has incurred no debt or obligations. In this manner it is able to operate indefinitely, while continuing to make progress each year. Additional small amounts of funding will speed developments.

EPS has made a new discovery in physics with the potential to locally produce low-cost, clean energy for homes and buildings, independent of power plants. EPS owns the new technology and plans to initially produce a safe, clean, 10-kilowatt electricity generator that needs no nuclear fuels nor fossil fuels and will produce no green house gases. A home owner would need a one-liter sized container of environmentally benign hydrogen/boron fuel per year at a 20:1 fuel cost savings compared to commercially produced electricity or fossil fuels.

EPS's new discovery would allow anyone worldwide to buy a small home generator, about the size but less than the cost of a Sears 10-kilowatt portable generator. It would power their home plus

several nearby homes even where there are no power grids or power plants. This will be a step towards providing low-cost, local electricity to help eliminate poverty worldwide.

EPS plans to build 10-kilowatt generators by applying its newly discovered technology to improve work done by others to create energy. The basic work was shown successfully in the 1980s at the University of Miami. But that technology had limitations at that time. EPS's new technology will overcome those limitations.

From a modest start with producing 10-kilowatt micro-fusion reactor powered generators, EPS expects to branch out to other applications of its technology as well as producing larger and larger generators.

Mankind's practically insatiable demand for energy implies a simply humongous market potential for EPS which would encompass all of the world's producers of oil, coal, uranium and electricity plus all manufacturers of transportation vehicles including cars, trucks, buses, farm equipment, ships, boats, construction equipment, trains, satellites, aircraft, snowmobiles, and military vehicles.

Several thousand neutron tubes are in use in the USA today that safely collide hydrogen ions to produce neutrons, which in turn are used for medical testing, industrial process control, and homeland security. An ion source produces hydrogen ions (deuterium), which are accelerated to 110 kilovolts, then directed to hit a hydrogen target (also deuterium), which produces neutrons, and also heat as a waste product. Neutron tubes today produce neutrons and a low level of heat energy. The low density of the hydrogen ions limits the amount of energy produced.

In the 1970's, Dr. Wells at the University of Miami collided two plasma toroids to produce low-level fusion energy in the TRISOPS system. The amount of energy produced was limited by the short duration time of the plasma toroids used, as well as their low density and their low level of energy.

Electron Power Systems, Inc., (www.electronpowersystems.com) has discovered a plasma electron spiral toroid that remains stable without magnetic confinement, by using background gas pressure for confinement instead. These new plasma toroids are observed to remain stable for thousands of times longer than classical plasma toroids, which opens the way for new clean energy applications.

EPS's new stable plasma electron spiral toroids overcomes each of the neutron tubes limitations, and will potentially result in fusion with no magnetic containment required – thus producing a practical micro-fusion reactor. EPS's challenge is to adapt the new stable plasma toroid to the TRISOPS method.

The micro-fusion reactor adapts the Electron Spiral Toroid (EST) Spheromak to the neutron tube design. The EST Spheromak is patented jointly with MIT scientists who also have published papers confirming the EST Spheromak physics and data. The EST Spheromak will overcome the neutron tube limitations by increasing ion density by 2500 times. A metal containment can be used for efficient heat energy collection and conversion.

The EST Spheromak micro-fusion reactor will be less than three feet in length, the same as for present neutron tubes, and small enough to fit in an electric car. Elimination of the need for magnetic containment allows this power supply to be small and compact. A micro-fusion reactor will use hydrogen/boron to produce clean energy without neutrons. The energy in one pound of

hydrogen/boron fuel equals the energy of 250,000 pounds of gasoline. Hydrogen and boron are plentiful and will not run out, as oil is projected to do in the 21st century.

The Electron Spiral Toroid Spheromak (ESTS) is a plasma toroid that is self-organized and self-stable with no magnetic fields needed to contain it. Inventor Clint Seward has not seen any published descriptons of any devices nor phenomena similar to the ESTS. The US Patent Office agrees and has issued five patents.

The micro-fusion reactor was recently selected by the New Energy Congress as one of the few technologies now known to have a genuine potential to replace fossil fuels. See the lengthy analysis of the micro-fusion reactor in http://pesn.com/2006/03/08/9600242_Spheromak_Plasma_Toroid/.

"Locomotive Power Sources" for high-speed rail in www.padrak.com/vesperman includes the micro-fusion reactor with BlackLight Power's hydrino generator, focus fusion, Robert Dratch's thorium powerpack, Kiev, Ukraine's I.N. Frantsevich Institute of Problems of Materials Sciences (IPMS) thorium-227 electricity generator, Clem over-unity vegetable oil engine, thin-film electrolytic cells, noble gas plasma engine, Searl effect generator, Magnatron - light-activated cold fusion magnetic motor, Oleg Gritsevich's hydro-magnetic dynamo, IPMS energy storage/battery device, metamatter which is solid crystallized fully-ionized plasma, Gordon Ziegler's electrino fusion power reactor, and environmental heat engines.

Some of these listed new energy inventions appear to have at least one limitation that is not shared with the ESTS micro-fusion reactor.

The Electron Spiral Toroid Spheromak (ESTS) micro-fusion reactor has five patents and is documented in published papers confirming the physics and data. (1), (2), (3), (4)

Clint Seward discovered the ESTS (5) while studying ball lightning. Seward has developed a secret formula to produce the ESTS that is not reported in any other reference to date that he has seen.

Why this is important is that all spheromaks reported to date dissipate in microseconds, while the ESTS has been observed to endure with no confining magnetic field for hundreds of milliseconds, and theoretically will remain stable for many seconds.

1. Seward, C., Chen, C., Ware, K., Ball Lightning Explained as a Stable Plasma Toroid. PPPS-2001 Pulsed Power Plasma Science Conference, June 2001.

2. D. C. Seward, C. Chen, R. Temkin, Energy Storage Device, US Patent 6,140,752, Oct. 31, 2000.

3. C. Chen, R. Pakter, and D.C. Seward, Equilibrium and Stability Properties of Self-Organized Electron Spiral Toroids, Physics of Plasmas. Vol. 8, No. 10. Oct. 2001.

4. W. J. Guss, Chen, C., Equilibrium of Self-Organized Electron Spiral Toroids. Physics of Plasmas. August 2002.

5. Seward, C., Ball Lightning Explanation, Leading to Clean Energy. Acton, MA 01720. Seward Publishing Co., 2011.

EPS plans to initially produce a safe, clean, 10-kilowatt electricity generator that needs no nuclear fuels nor fossil fuels and will produce no green house gases. A home owner would need a one-liter sized container of environmentally benign hydrogen/boron fuel per year at a 20:1 fuel cost savings compared to commercially produced electricity or fossil fuels.

But first EPS needs to obtain $2 million as a first round of investment to complete the development of a demonstration unit in eighteen months. A second investment of $8 million will then be needed to complete a prototype unit in eighteen months after the demonstration unit.

EPS's new discovery would allow anyone worldwide to buy a small home generator, about the size but less than the cost of a Sears 10-kilowatt portable generator. It would power their home plus several nearby homes even where there are no power grids or power plants. This will be a step towards providing low-cost, local electricity to help eliminate poverty worldwide.

From a modest start producing clean, reliable, safe 10-kilowatt micro-fusion reactor powered generators, EPS plans to methodically produce larger and larger generators. EPS even has a preliminary design with supporting calculations for massive 1000-megawatt baseload generators.

Mankind's demand for energy implies an enormous market for micro-fusion reactors encompassing all of the world's producers of oil, coal, uranium and electricity plus all manufacturers of transportation vehicles including cars, trucks, buses, farm equipment, ships, boats, trains, satellites, aircraft, mining equipment, snowmobiles, construction equipment, and military vehicles.

Countries which export oil will benefit from not having to quickly burn up their finite oil reserves on cheap gasoline and diesel fuel. Instead they will be able to draw down their reserves more slowly by making products of higher value such as plastics, medicines, fertilizers and synthetic textiles.

Some years ago a Forbes article stated that PECO (formerly Philadelphia Electric Company), with an income stream to back it up, was able to sell on Wall Street $4 billion worth of bonds paying 5.8 per cent. A micro-fusion reactor powered generator manufacturer could simply sell bonds to build and operate generators at a low interest rate. Generator loan payback times may be in the ball park of a half-year to a year, depending on the local electricity market price. As soon as a micro-fusion powered generator is paid for, the revenue from that time on would be almost pure profit. Once a track record is established by successfully installing a few micro-fusion reactor powered generators, Electron Power Systems, Inc., could raise money to build and install more generators by simply selling billions of dollars of bonds instead of stock. So therefore, there wouldn't be any dilution of ownership.

EPS plans to partner with major electricity producers and suppliers. EPS will license them to produce electricity as they do now. EPS plans to partner with automobile manufacturers to license the technology. EPS plans to partner with defense and aerospace contractors to license the technology.

MANAGEMENT

Clint Seward is the discoverer of the Electron Spiral Toroid Spheromak and received the initial patents. He has been working ever since to scale up the results, which he has been able to do recently. He has been a project design engineer and program manager for many years, working initially with the US Air Force B-58 Hustler program, and as a project manager and engineering

manager in several major corporations. His work was defense initially, moving to security and process control, then energy related.

Clint was an Engineering Manager for Mosler, an American Standard Division 1970 thru 1978, and an Engineering Manager and VP of Marketing for Bristol-Babcock 1978-1985 – an ACCO fortune 500 Company. He was General Manager of Iontrack, a Division of a large international company 1985-1989 (now a Division of GE). He has been President of his own company Electron Power Systems, Inc. from 1989 to present.

Education: MSEE; University of Michigan 1965; BS at US Military Academy at West Point 1963.

D C Seward is the VP Engineering of Electron Power Systems, Inc. He has worked on the micro-fusion reactor technology since its inception in 1986. He has the responsibility for organizing the experiments and bringing qualified people in to help with the work. DC has worked as the VP Engineering of EPS on a contract basis from 1998-Present as funding allows. He is employed full time as a Field Sales engineer for Ember Systems, a wireless technology company, 2005-Present. Previously he was a Product Design Engineer, Trimble Navigation: 1994-1998

Education: MSEE Massachusetts Institute of Technology, 1994.

Jim Becker is acting CEO and Marketing VP. Jim has experience as a senior executive in the high tech sector with extensive experience managing rapid growth organizations. He has a broad technology background with proven skills in computer systems, avionics industries, and health care information technology along with direct functional experience in finance, sales, marketing, engineering and corporate management in both domestic and international settings.

Education: Thayer School of Engineering, Dartmouth College; Master of Engineering 1976; Master of Business Administration 1975; Bachelor of Engineering 1970.

PAPERS AND PATENTS for Clint Seward:

Chen, C., Pakter, R., Seward, D. C. "Equilibrium and Stability Properties of Self-Organized Electron Spiral Toroids." Physics of Plasmas. Vol. 8, No. 10. October 2001.

Seward, C., Chen, C., Ware, K. "Ball Lightning Explained as a Stable Plasma Toroid." PPPS-2001 Pulsed Power Plasma Science Conference. June 2001.

Seward, C. "Propulsion Using a Stable Plasma Thruster." STAIF 2001, (Space Technology and Applications International Forum-2001). American Institute of Physics , www.aip.org/catalog/conforder.html. February 15, 2001.

Seward, C.; Chen, C., Temkin, R. ENERGY STORAGE DEVICE , US Patent 6,140,752, October 31, 2000.

Seward, D. C. Electron Spiral Toroid; US Patent 5,773,919; June 30, 1998.

Seward, D. C. Energy Storage System, US Patent No. 5,589,727. December 31, 1996.

Seward, D. C., Chen, C., Temkin, R. (1996b). International Patent Application WO 96/38848, Energy Storage Device, Published December 5, 1996.

Seward, D. C. Fixed Geometry Plasma and Generator, US Patent 5,175,466. Dec. 29, 1992.

ESP's President Clint Seward collaborated with Gary Vesperman in writing a description of Seward's invention in www.padrak.com/vesperman. See "Locomotive Power Sources".

The Products page of www.electronpowersystems.com sells a book "Ball Lightning: Leading to Clean Energy" and a paper "Spheromaks Observed Forming in Atmosphere". Paper's abstract:

Plasma toroids, called spheromaks, are reported here as observed forming in partial atmosphere from high power electric arc events similar in power to lightning ground strokes. The spheromaks are observed to be stable in partial atmosphere with no confining magnetic fields and are observed to last for more than 200 milliseconds in partial atmosphere. This paper describes the observations and presents a model that explains the properties of these spheromaks, which we call Electron Spiral Toroid Spheromaks (ESTS's) due to the spiraling motion of the charged particles. It includes four TV images. The model presented is a hollow toroid with a thin outer shell of electrons that all travel in parallel paths orthogonal to the toroid circumference, in effect spiraling around the toroid. A comparable inner surface of ions acts to neutralize the space charge. The paper provides formulas describing the ESTS. Potential ESTS applications include X-ray production, air defense, and energy production.

The cost to produce a 10-kilowatt EST Spheromak electricity generator would be about $1100 in production quantities. The EST Spheromak generator would have fewer parts than a comparable Sears generator.

Electron Power Systems, Inc., does not have a working prototype. The company has identified the instrumentation and needs another $100,000 for laboratory work. With $2,000,000, the company expects to have in two years a demonstrable prototype. In an additional year for $8,000,000 a production prototype is expected to be built. Remember, each piece of the project uses technology others have demonstrated.

Clem Over-Unity Vegetable Oil Engine

Richard Clem was a heavy equipment operator who had noticed that a hot asphalt sprayer would continue to run for up to an hour even after the power was turned off! So he built a modified version as a 200-pound engine which ran on vegetable oil at 300 degrees and was started by a 12-volt battery. The heat is internally generated by the engine. During a nine-day test conducted by Bendix Corporation engineers, the engine in its self-running mode consistently generated 350 horsepower into a dynamometer. The engine is constructed from off-the-shelf components except for a hollow shaft and a custom cone with enclosed spiral channels.

If the automobile industry adopts the Clem over-unity engine, motorists could change its eight gallons of vegetable oil only every 150,000 miles and never buy any gasoline. To illustrate the engine's durability, the only working model of the Clem engine has been continually running on his son's farm for several years.

Combining the Clem over-unity engine with the hydrosonic pump could provide distilled ocean water as well as hot water for space heating, kitchens, and bathrooms at *no* energy cost.

The Clem over-unity vegetable-oil engine is not patented. It may be fairly straightforward to set up a small machine shop for manufacturing hollow shafts and cones.

Thin-Film Electrolytic Cells

A number of seasoned technology integrators have developed thin-film energy storage technologies which hold considerable promise. Dr. George Miley, Dr. Robert Hockaday and others have developed thin film technologies with energy densities exceeding 250-400 watt hours per kilogram. Dr. Miley's invention is illustrative. Using a flowing pack-bed type electrolytic cell with 1-molar $LiSO_4$ in light water, 1mm plastic beads with a very thin [500-1,000 angstrom] film of metal [nickel, palladium, titanium] are employed. A special sputtering technique is used to spray the metals onto the surface of the beads. With 2-3 volts of electrical power and 1.5 milliamperes of current, the single film experiments have shown the material to produce more than 10 times as much output power as input. The input power is no more than 0.01 watts while .5 watt of heat is produced.

It is likely that the physics involved in this reaction involve the release of energy as a by-product of nuclear transmutation. Dr. Miley has written, "The key finding from these studies has been the observation of a large array of "new" elements (i.e., different from the original bead coating), many with significant deviations from natural isotopic compositions, after the run.

Great care has been made to ensure that these elements are distinguished from isotopic impurities by use of a "clean cell" with high purity components and electrolytes, in addition to the pre-and post-run analyses. Even low-energy radiation was detected from the bead days after each experiment. Applications to space power, providing a 1-kilowatt cell with only 500 cubic centimeters of active electrode is predicted." Note that this particular invention, with its large over-unity energy yield, was awarded a NERI grant by the DOE. At the insistent urging of the American Physical Society and representatives from MIT and other universities whose laboratories are currently engaged in high-temperature gas-cooled nuclear reactor research, Secretary Richardson eventually withdrew the grant. The tangle-footed Department of Energy actively discourages the development of new sources of energy, presumably to appease the oil, uranium and coal companies. The U.S. Patent Office has unfairly classified secret nearly 5000 energy patents. Luckless energy inventors then risk 20 years in prison if they work on, sell, or publicize their energy invention – often created at great personal sacrifice.

Searl Effect Generator

The Searl effect generator (SEG) can be used to charge the batteries in a self-powered electric vehicle. A solid-state device, the heart of an SEG is a series of three concentric magnetic rings with magnetic rollers going around the rings. Both the rollers and rings are comprised of four layers of titanium, iron, nylon, and neodymium.

The magnetic fields impressed on the rollers have both AC and DC components. The AC component is for floating the rollers so they don't touch the rings. The DC component is to prevent them from flying off. The innermost set contains a minimum of 12 rollers for the same reason that a linear motor will not operate with less than 12 phases.

The inner set of rollers travel around at 250 miles per hour, the middle set travels at approximately 600 miles per hour, and the outer set at approximately 1500 miles per hour. Hundreds of millions of volts are generated the energy of which is picked up by brushes positioned all around the outside set of rollers.

An SEG also creates an anti-gravity field. An uncontrolled SEG will rise about 50 feet as the rollers increase speed, emit a light blue halo which indicates energy is being extracted from the ether, and then shoot up into the sky gaining speed, never to be seen again. At least one roof has been holed by an SEG. The friction-less rollers can be prevented from reaching the critical velocity that produces lift by use of a “governor”, either mechanical or electronic.

An SEG can be easily controlled by immersing it in an electromagnetic wave field the frequency of which is a harmonic of the SEG’s primary frequency. While in resonance, the magnetic poles of the rollers reach a unification state, and they stop moving.

The inventor has built and flown a small “inverse gravity” vehicle. A flying saucer-like SEG-powered aircraft about the size of a bus is currently being built in England by a private group.

The inventor for some years independently powered his house off the power grid with a home-sized electrical generator version of the SEG. A householder could set up a 45 x 45-cm unit and generate an output of 11 kilowatts of free electrical power.

Oddly, a house powered by an SEG has been observed to have greater healing powers than conventionally electric powered houses. The healing effect is claimed to be due to the electrons zapping the occupants, taking away pain and returning blood more quickly to damaged tissue. The SEG would also help combat asthma, bronchitis, hay fever and lung complaints due to the increased supply of oxygen in the body. Conventional methods of electric power do not pump out electrons which results in tired eyes and a tired brain.

The SEG's negative charge also means that dust stays in the carpet instead of floating in the air. This is similar in action to negative ion generators sometimes sold as air fresheners.

Two Russian scientists replicated the Searl effect generator and vindicated all of these somewhat unusual claims. See their paper “Experimental Research of the Magnetic-Gravity Effects”, V. V. Roschin and S. M. Godin, Institute for High Temperatures, Russian Academy of Science, Izhorskaya 13/19, Moscow 127412, Russia.

At one time, a German power company reportedly considered replacing a nuclear power station with eight fuel-less SEGs costing a total of about $4.5 million and generating a total of 240 megawatts with no pollution.

Noble Gas Plasma Engine

Joseph Papp was granted US Patent #3,670,494 for his “Noble Gas Plasma Engine”. A mixture of recycled inert gases (helium, neon, argon, krypton, and xenon) is exposed to a high-voltage discharge in a sealed cylinder with a piston. The spark causes the gases to expand violently though no combustion occurs. Mechanical energy is delivered by the piston's displacement. The gases immediately collapse to their original density, and the cycle is repeated. After several thousand hours the gases lose their elasticity and are replaced. The operating cost is 15 cents an hour.

The first prototype was a simple 90-horsepower Volvo engine with upper end modifications. Attaching the Volvo pistons to pistons fitting the sealed cylinders, the engine worked perfectly with an output of three hundred horsepower. The inventor claimed it would cost about twenty five dollars to charge each cylinder every sixty thousand miles.

There were indications that such an engine could provide its own electrical power and being a closed system, require no fuel. It is not by definition an electromagnetic engine, however. It is believed that at the heart of the Papp engine is the development of high-density electrical charge clusters which provide the energy to expand the gases.

Other patents are 5319336, 4151431, 3670494, 4046167 - Mechanical Accumulator, 3680431 - Method and Means for Generating Explosive Forces, and 4,428,193 - Inert Gas Fuel, Fuel Preparation Apparatus and System for Extracting Useful Work from the Fuel.

Magnatron – Light-Activated Cold Fusion Magnetic Motor

During the late 1970's Howard Rory Johnson, a brilliant inventor in Elgin, Illinois, combined light-activated cold fusion with a new type of magnetic motor into a "Magnatron". His prototype Magnatron produced 525 horsepower but only weighed 475 pounds. It could propel a large truck or bus 100,000 miles on about 17 ounces of deuterium and 1.5 ounces of gallium before being recharged. This was years before either Pons and Fleischman or Dr. James Patterson entered the scene with their cold-fusion technology.

Johnson discovered the light-activated cold fusion portion of the Magnatron by accident when as he was developing a new type of electronic circuit using deuterium oxide and gallium, he noticed the two materials were producing energy on their own. He could not figure out what was triggering the energy production for some time until he finally discovered it was light.

The Magnatron's flow of deuterium (an isotope of hydrogen) is controlled by magnetic tunnels. At the point where the deuterium strikes the gallium (a heavy metal electron donor), a beam of light from a diffraction prism forces their fusion. That controlled reaction results in the fusion of two atoms forming a new atom. In the process, electricity is released, and that is what powers the magnetic motor. The Magnatron is sealed, however, so 'light' is provided from photon energy produced from coils tied directly to the motor. It is more or less a pulse-generated system.

A photon is a football-shaped particle of electromagnetic wave energy. Its energy content is a product of its frequency f and Planck's constant h. When an electron in orbit around the nucleus of an atom drops to a lower, less energetic orbit, a photon containing the energy equivalent to the electron's energy drop is emitted. This explains why light and other forms of electromagnetic energy such as gamma rays and radar are sometimes observed as particles and other times as waves. The heated filament of a light bulb is an example of photon production.
There is no way to explain, using contemporary electrical theory, how his relatively small motor could produce such tremendous horsepower. Utilizing his own new electrical-magnetic energy theory, involving a process he called "attract-attract", Johnson exploited the magnetic field. He used the top and bottom rotors in his motor. First, the top rotor attracted, released; then the bottom rotor attracted, released. The action of attraction, alternating between upper and lower magnets, used the windings to complete the attract field.

Robert Nelson's compilation of articles about the Magnatron provides much more technical detail on the Magnatron than the foregoing. (See http://www.rexresearch.com/magntron/magntron.htm.)

Johnson constructed his prototype Magnatron's 525-horsepower magnetic motor without any of the hardware that is presently used in present state-of-the-art electric motors. Conventional motors use the accepted principle of attract-repel, an energy form that doesn't utilize the magnetic field to its greatest advantage. For comparison, a typical 500-horsepower electric motor has wires exiting it that are the size of a garden hose.

The sealed self-contained Magnatron has no wires. Thus, other than the Magnatron's infrequent refueling with small amounts of deuterium and gallium, the stand-alone Magnatron uses no input power. The Magnatron's entire output power is conveyed by its magnetic motor's rotating shaft.

Fuel for the Magnatron is plentiful: deuterium is derived from water, and gallium is extracted from abundant aluminum bauxite. Commercially available pure gallium is still scarce and expensive. It may well be possible, however, to cheaply transmute another less expensive element into gallium. See Gary Vesperman's list of over two dozen methods of neutralizing radioactive waste in http://freeenergynews.com/Directory/NuclearRemediation/Vesperman/ which includes possible transmutation methods. Additional methods are briefly described in http://freeenergynews.com/Directory/NuclearRemediation/. Dr. Santilli's method plus an explanation of suppression of radioactivity neutralization methods are available at http://www.nuclearwasterecycling.com/. Robert A. Nelson's survey "Transmutations of Nuclear Waste" is at http://www.rexresearch.com/articles/nukewa.htm.

The Magnatron uses no fossil fuel in its operation, and it emits no pollution. The magnetic motor's RPM is 8,000 with a gear ratio of 2:1. Lubrication for the sealed motor is synthetic motor oil which does not need changing and does not need a filter, because foreign materials such as carbon and varnish are not introduced into the system, as they are in the internal combustion piston engine.

This writer, Gary Vesperman, attended the 3rd International Symposium on New Energy in Denver, CO (April 25-28, 1996). I remember being impressed by Gerald Orlowski"s lecture "Magnatron, Fusion Magnetic Motor", during which he provided substantial technical information on the Magnatron.

Orlowski reported that, "Some inside information revealed that OPEC had been keeping track of all competitive technology", and Johnson was #1 on their hit list! Johnson was about to manufacture the motors through a nationwide dealership. Some motors still exist, but the owner wants several million dollars for them."

This writer Gary Vesperman knows of very few inventions of new energy sources which are reasonably large stand-alone energy producers. Besides the Magnatron, they include Oleg Gritskevitch's hydromagnetic dynamo, and Electron Power Systems' micro-fusion reactor, which employs stable high-density plasma electron spiral toroids. Almost all inventions of new energy sources are, or claimed to be, relatively small over-unity power converters that convert input power to greater amounts of output power. Bob Dratch's thorium powerpack is an exception (see above).

At the September 14, 2005 public meeting in Green Valley Ranch casino regarding the proposed Regional Fixed Guideway traversing Las Vegas, Nevada, this writer Gary Vesperman submitted comments suggesting possible power sources for the train, including descriptions of the hydromagnetic dynamo and the micro-fusion reactor (http://www.rtcsouthernnevada.com/rfg/documents/September2005PublicMeetingMinutes.pdf, pp. 19-77).

No wonder the Magnatron's inventor, Rory Johnson, was rumored to have been "Number One" on Organization of Petroleum Exporting Countries (OPEC)'s hit list.

The following is an excerpt, slightly edited, from Orlowski's lecture transcript where he tells about his unwitting personal involvement with the U.S. Government's suppression of the Magnatron:

"After I saw the Magnatron motor, my life changed. I was no longer a happy camper working by myself in a wonderful, fully equipped research machine shop for the Greyhound/Armour Corporation in Arizona. While on a business trip, I saw this motor running in the Magnetron, Inc.'s showroom located in Eglin, Illinois.

"During my 15 years of electric motor repair, among the hundreds of motors I repaired, I rewound a 500 HP electric motor. That motor had wires exiting it that were the size of a garden hose. The Johnson motor being shown had NO wires. Surely this motor was unreal, a con-job to get money for dealerships. Yes, there he was, Rory Johnson standing next to his sealed self-contained electric motor.

"Upon returning to the Greyhound Towers and telling them what I had seen, they instructed me to call Mr. Johnson. Greyhound wanted Johnson to put forth a plan to install a motor in one of their buses for testing purposes.

"I called Johnson. He was delighted that a Greyhound employee had seen the motor running, and replied that the testing idea was acceptable. He would set a time frame for just when a bus should be delivered to him.

"Two years went by, with no business proposal from Johnson. Then, his former business partner, Mike Marzicola, called to say Johnson had passed away. He wanted me to work with him to get one of the motors running. I flew to Orange County, CA, saw the motor, took pictures, and put forth a plan to Greyhound. Subject to a contract with Marzicola, one of the old worn motors would be brought to the research shop. I would then very carefully reconnect the generator wires that Johnson had cut off prior to moving from Elgin, IL to California.

"Discussions with Marzicola brought out that the U.S. Government (given the authority by the Congress of 1952) had issued a GRAB order to take Johnson's motors. Rumor has it, the DOE is run by US oil companies and OPEC, and they want no competition, period. Because of this grab order, Johnson had cut the generator wires. He had then put his `total shop', with motors and all, on several U-Haul trucks and left Illinois in the middle of the night. He went to California to re-establish his business. But before he could get a motor running, he passed away.

"Surely, Greyhound would agree to let me re-start one of Johnson's motors. The wonderful proposal put forth to Greyhound was rejected by mail. Very agitated, I went to the top office at Greyhound demanding an explanation. I was met at the door with the comment, "We know why you are here." Knowing the potential savings to the bus company, surely they could have only one reason for rejecting the proposal. They must have believed I was not qualified to start up the motor.

"Greyhound's top legal advisor stated he was present when the Greyhound board met and discussed my written proposal. He stated the following, "At NO time was the thought put forth that you would not succeed. In fact, we discussed all of the hardware designed and constructed by you, and started the conversation from what happens when Greyhound has a running motor. We contacted a State representative who felt this motor should not be allowed to be used in 4,000+ buses. The loss in tax

dollars for fuel alone would be a very huge sum." He then asked me to leave, stating he was sorry that he had to tell me the reason the plan was rejected.

"Telling Marzicola of the rejection, I offered to personally put in a few thousand dollars toward the parts to get one motor running. In return, I would be assigned the dealership for the Phoenix metropolitan area. We signed legal papers in exchange for the money agreed on, and went to work. (I still have the signed dealership.)

"The first thing I noticed was that someone had been working on repairing the motors. Three motors already had new commutator assemblies installed. Each assembly consisted of 3 commutator assemblies on one insulated tube with a metal case to secure it to the shaft.

"One motor still had the old worn commutator assembly, as it had not yet been repaired."

Orlowski goes on to describe his reconstruction efforts and includes interesting technical details about the Magnatron's structure and theory.

Johnson did not know that OPEC tracks all potential competition to its oil business and that he was reportedly number one on OPEC's hit list. His first mistake was publicizing, in many magazines, his plans to manufacture and distribute his revolutionary motor.

Erik Masen has spoken with a few people who even signed up for distributorships. Erik Masen had included Johnson and his Magnatron in his energy invention suppression anthology (see http://www.electrifyingtimes.com/erik masen suppression.html).

In 1979, Johnson placed his engine in a Buick Electra and was preparing to drive it around the country to sign up more distributorships when the US Department of Energy and the State of Illinois teamed up to prohibit his company Magnatron, Inc., from producing and selling Magnatrons. They first placed a gag order on all the people in the company by using the Secrecy Act of 1952.

Secondly, the State of Illinois immediately requested the company to provide information about all of their employees, distributors, stockholders, investors, suppliers, etc. They asked questions that blatantly deny anyone's constitutional rights to privacy. The pressure from the State of Illinois became so overwhelming that Johnson decided to move his entire business to California in the middle of the night.

After a year of hearing nothing but silence from Johnson, Greyhound agents tried to contact him – only to be notified that he had passed away unexpectedly. This is a particularly troubling part of the story, since he had been in his early fifties and in robust health. Later, Greyhound learned that shortly before he died, Johnson had inexplicably moved out of his laboratory in the middle of the night and taken all of his motors and technology to California.

Bob Bass, in his report copied below on low-energy nuclear transmutation, claims that the CIA, the KGB and the Mossad, etc. all have "sprays" which can be sprayed upon someone and cause him or her to die of apparently natural causes. One speculation is that Johnson's death – apparently due to heart failure – had been artificially induced by such a spray.

In a January 20, 2007 email to Gary Vesperman, Terry Sisson reports:

"Hi Gary,

"I visited Magnatron, Inc., in July 1979. I wish I would have taken a photo. Placards were placed over every inch of the large windows in the front of the building listing all of the questions the State of Illinois requested his company to provide. He wrote, "When has the government ever had the right to ask this of any company." I peeked in the front window and saw one of his motors mounted on an engine stand. Nobody appeared to be there so I walked around to the rear of the building. I found the rear garage door open and could see the Buick Electra inside. I was about to approach nearer when a man emerged. We talked, but he quickly informed me that due to a US gag order he was unable to talk about anything. I managed to get his phone number and called him from time to time for years following. He was an assistant of Rory's and he kept the information very close to the vest. He did tell me that it was real and it worked, yet not how it worked.

"About 1984, I began to call all the Johnsons in the phone book in Elgin. I finally got a hold of Rory's son. He too said that it was real, but I got nowhere. Around 1992, I met Jerry Orlowski, and he told me his experience as the employee of Greyhound who was sent to investigate the technology, since he wound electric motors for several years. Jerry was very upset about the whole incident, particularly Greyhound's Board of Directors refusal to utilize the technology after he found the technology to be authentic. Jerry even witnessed the government's seizure of the motors in California. --- Terry Sisson."

Hydro-Magnetic Dynamo

The hydro-magnetic dynamo is a doughnut-shaped large-scale emission-free electrical generator which does not requires external fueling and operates safely, reliably and silently at moderate temperatures. The dynamo is capable of powering larger transportation vehicles such as buses, trucks, ships, locomotives, and airplanes. Doubt remains about making dynamos compact enough to power automobiles.

The circumstantial evidence for the Russian inventor's performance claims for his hydro-magnetic dynamo is reasonably strong. While three experimental prototypes have been built with Russian and Armenian expertise and equipment, a fourth demonstration prototype needs to be built with more modern Western engineering expertise and equipment to verify dynamo performance claims and to further explore the dynamo's potential capabilities. Performance claims are as follows:

Hydro-magnetic dynamos are scalable from 100 kilowatts to 1,000 megawatts. One doughnut-shaped, fuel-less 1000-megawatt dynamo is about the size of a two-car garage. For comparison, Hoover Dam's 17 generators have a total nameplate capacity of 2,080 megawatts. Seven 1000-megawatt dynamos can be vertically stacked to comprise a single 7000-megawatt dynamo.

A dynamo can reliably run continuously for 25 years or more with little or no maintenance, no external fuel source, and no pollution. If a dynamo's output is 1,000,000 watts, its total input power is approximately 10,000 watts. So the dynamo's energy efficiency is 10,000%, or 100 to 1.

The source of the dynamo's massive electrical output is a nuclear reaction which is not generally known to mainstream science. However, it is known that the dynamo produces alpha particles which are helium nuclei made from fused deuterium, an isotope of hydrogen with one proton and one neutron. The electrons missing from the helium nuclei are what seem to provide a copious "sink" of electricity, and which happen to be the secret to the dynamo's ability to generate an exceptionally large amount of electricity.

It is also known that the dynamo uses high-density charge clusters. High-density charge clusters are the basis of plasma-injected transmutation of elements and also neutralization of radioactive materials.

There were three dynamo prototypes built. The first two small experimental prototypes were built in Vladivostok. The third and last prototype continuously generated electricity, except when turned off to incorporate improvements, from 1992 to January 1997 in Armenia. (It was sadly destroyed during an armed rebellion by local religious fanatics who were unhappy with the Armenian government.) It generated a constant current of 6,800 amperes at 220 volts DC. That multiplies out to nearly 1.5 megawatts. The Armenian prototype dynamo's toroid weighed 900 kilograms and had a diameter of approximately 2 meters.

Cooling water is circulated through copper pipes wrapped around the toroid. The heat is expelled from the cooling water with a heat exchanger.

After a dynamo is assembled in a factory, the water is literally jump-started (by discharging a large bank of capacitors) to moving around the toroid. The dynamo's controls are temporarily set to generating enough of a modest amount of electricity to sustain itself, even while being transported from the factory to its site. For the Armenian prototype dynamo, two 10-farad capacitor banks (from Russian military radar stations) were used to provide the initial water motion (acceleration and excitation of water). Using a total of 20,000 joules, 100,000 volts with 0.05 amperes of current were applied to the Armenian dynamo for 3 - 5 minutes for starting its generation of electricity.

After these Russian radar capacitors were used to jump-start the Armenian prototype dynamo, a bank of buffer batteries sustained continuous operation when water motion and ionizing occurs. This battery bank contained 8 powerful 12-volt, 150-ampere lead batteries. The Armenian dynamo's sustaining input power was 14,400 watts. The nominal maximum output power is nearly 1,500,000 watts. Once, the output current was accidentally increased to 40,000 amperes for almost a minute. Fortunately, the power was reduced to a safe level before the water started to boil. Internal coils (windings) control water velocity and therefore dynamo power.

The dynamo's production cost is estimated at $500 per kilowatt which is competitive to nuclear power’s capital costs of $5,000 per kilowatt, windmill capital costs of $4,000 per kilowatt, etc. A well-run nuclear power plant can generate power for 1.5 cents per kilowatt-hour, coal 1.8 cents, natural gas 3.4 cents, and oil 4.1 cents, on the average. The dynamo’s operating cost would be approximately .1 cent per kilowatt-hour with no external fuel needed nor pollution.

Dynamos could replace all nuclear power plants, solar installations, wood-burning furnaces, hydro-electric dams, windmills, fossil-fueled power plants, etc. Satellites, locomotives, heavy trucks, buses, airplanes, and ships are obvious transportation applications. It does not seem that dynamos can be made compact enough to power electric cars although it certainly would be worth trying.

A Forbes article states that PECO (formerly Philadelphia Electric Company), with an income stream to back it up, was able to sell on Wall Street $4 billion worth of bonds paying 5.8 per cent. A dynamo manufacturer could simply sell bonds to build and operate dynamos at a low interest rate. Dynamo loan payback times may be in the ball park of a half-year to a year, depending on the local electricity market price. As soon as a dynamo is paid for, the revenue from that time on would be almost pure profit.

Once a track record is established by successfully installing a few dynamos, the dynamo company could raise money to build more dynamos by simply selling billions of dollars of bonds instead of stock. So therefore, there wouldn't be any dilution of ownership.

A recent IEEE Spectrum article stated that world demand for electricity increases approximately 500 megawatts every day. To put this in perspective, the equivalent of another Hoover Dam would have to be built every four days to keep up with world electricity increase demands. Or, a dynamo manufacturing company would have to build another 500-megawatt dynamo every single day of the year to keep up with world electricity increase demand in addition to replacing all existing generators fueled by hydro, nuclear, and fossil fuels.

The following is a highly condensed summary of the "Description" of the dynamo's Russian patent IPC H 02 K 44/00 “Method of deriving of electrical energy and organization of Gritskevich’s MHD-generator for its realization”:

The dynamo is a sealed toroid filled with distilled water with heavy water (deuterium oxide) added. Movement of water inside the closed loop and use of unique properties of water as a polar liquid cause a release of electrical energy as an outcome of a rupture of hydrogen connections. Additional electrical energy is drawn from nuclear reactions and micro-cavitational processes. The liquid gets ionized and moving around the toroid at start-up time by a running magnetic field with the help of stimulating electromagnetic windings.

A layer of segnetoelectrical material covers the internal surfaces of the toroid. 32 electrodes made from a hard-alloy material are inserted into the toroid at equal distances apart. These 32 electrodes are connected to a power supply. Additional stimulation windings are also connected to the power supply.

The partially pre-ionized (on the part of the heavy water) water gets ionized further by the high-voltage discharges by the 32 electrodes. With the help of the stimulation windings, a running magnetic field is created which moves the water in one direction inside the toroid. An electromotive force gets created by the electromagnetic induction in a separate set of windings. During the movement of the water stream free electrons get created, and an additional energy gets emitted because of the water’s friction (viscosity) against the layer coated on the inside surface of the toroid, because of electrostatic breakdowns of cavitatal-vacuum structures, and because of the ongoing nuclear reaction. 100 times as much electrical energy is generated as required for electrical energy input.

Note that the hydro-magnetic dynamo is always producing electricity once it is manufactured and jump-started at the factory. Whenever a locomotive is parked in sub-freezing weather, its hydro-magnetic dynamo’s electricity output would be used to heat the dynamo’s containment to prevent its water-filled toroid from freezing.

Whenever a locomotive is parked, its hydro-magnetic dynamo’s excess electrical output could be sold to the local power grid.

IPMS Energy Storage/Battery Device

During the summer of 1984, airborne intelligence surveillance teams of the United States Air Force, operating out of specially configured and equipped Boeing 707 airframes (called AWAC’s) electronically detected (and then shortly thereafter photographed) bursts of coherent light of

enormous power originating in the vicinity of Dushambe, Turkministan. The bursts of light, a brilliant blue-green color, lasted just a few seconds and were shifted almost to the ultraviolet end of the light spectrum. The "laser" beams were directed upwards out of the atmosphere towards American military communications satellites.

At precisely the same time the AWAC's detected and photographed the laser bursts (they were referred to in that jargon by American military analysts but later proved to be something almost entirely different), several of the satellites essential to America's global military command and control communications systems became inexplicably inoperable.

The Defense Intelligence Agency, under the direction of the National Security Council and assisted by the National Security Agency, escalated its surveillance of the remote site in the Ural Mountains from which the bursts first originated. For several months, during a concerted campaign of uninterrupted observation by AWAC's and American spy satellites, no additional bursts were observed or reported. Then, without warning, in the middle of the night nearly seven months later, AWAC's crews operating just outside the territorial airspace of Afghanistan detected similar laser bursts of lower intensity during a period of intensive localized ground warfare.

The Afghanistan bursts were apparently aimed at targets under attack by Soviet infantry units. The laser bursts continued in a sustained, localized but obviously mobile attack pattern, as frequently as four or five times per hour, until nearly sunset of the next day. Photographic evidence gathered at the time by the AWAC's crew, and later corroborated by photographs taken at the actual site of the fire fight and forwarded to the U.S. for analysis, showed that the targets of the laser bursts were ammunition and fuel supply depots located in the remote desert. Several of the ammunition and fuel caches had apparently been destroyed during the attack, as demonstrated by the evidence of explosions, fire, smoke and residual infra-red heat patterns detected, photographed and electronically recorded on-board the AWAC's.

All this information was transmitted (via encrypted communications bursts, routed through the military Global Command Control satellite system) to the National Security Agency (NSA), located at Fort Meade, Maryland. Analysts there recognized that they were looking at evidence of a weapons system which had never been observed before. They did not know what had produced the laser bursts. But they did know that the technology which made such a thing possible was not available to the countries participating in the NATO Convention. They were terrified at the implications of such a development.

Within hours, the information was packaged into classified documents and conveyed to the Joint Chiefs of Staff. The Joint Chiefs examined the information while they were being briefed by the AWAC's crews which had witnessed and recorded the events. After the briefing, the crews were dismantled, and their various members stationed far away from one another, with orders never to discuss the events they had witnessed. Officially, the laser bursts never had occurred.

Secretary of Defense Frank Carlucci took delivery of the packet at his residence in Falls Church, Virginia, three days later, at a private, secret meeting held in the middle of the night. No one has yet adequately explained why the Joint Chiefs waited three full days to brief the Secretary. Early the next morning, he was driven in a specially prepared bulletproof limousine to the White House. He personally delivered the information to the new President of the United States, Ronald Reagan. The content of the Secretary's report had an immediate, measurable impact.

It was this series of events which principally precipitated the Strategic Defense Initiative, a program of military defense and reprisal based on America's state-of-the-art satellite-borne laser-optical and particle accelerator technologies. The S.D.I. system was intended to provide the U.S. with a meaningful deterrent to further aggressive use of the technology developed by the Soviet Military.

There was only one problem with this system, aside from the fact that its astronomical costs almost bankrupted the American economy: it did not work. S.D.I. was designed to respond to a kind of technology which was not achievable in the West, and which could not be explained by any of the models, materials, technologies or sciences known in the West.

In 1985, the top-secret military version of the space shuttle, code named Atlantis, embarked on a special orbital mission. One of its mission assignments was to retrieve, examine or photograph the military spy satellites which had been disabled by the laser bursts recorded in 1979-84. The results of this investigation have not been declassified or released in any but the most censored version to the public. What we do know for certain, as a matter of publicly available non-classified information, however, is that each of the disabled satellites appeared to have had at least one, and in some cases as many as four or five precisely measured holes, approximately the size of an American silver dollar, melted completely through them from the outside.

The photographs taken of the satellites show evidence of intense heat, charring and carbonized residue evenly distributed around the perimeter of each hole. The evidence is clear and unmistakable – the satellites were disabled by a coherent beam of some sort, characterized by such intense energy that it was possible to melt consistently measured holes through the exterior and interior components of American military satellites, after having passed through the atmosphere of the planet and into space for as many as 325 miles. Such a thing has scarcely been dreamed of by the American military, much less put into any but the most nominally effective operational form.

After more than ten years of political, economic and technological wrangling, and after the expenditure of more than one hundred twenty billion dollars in largely ineffectual research and development efforts, it is inescapably clear that no amount of money or political pressure, no amount of geo-political posturing or economic sanctions was going to compel the disclosure or replication of the technologies which produced the results photographed over the Carpathian Mountains and the Afghanistan deserts. The Soviets had developed a weapons system which was so revolutionary that it could not be explained, replicated or defended against.

The Reagan Administration's lack of specificity about the nature of the implied threat to which S.D.I. was supposed to respond subjected the Administration, the Defense Department and the R&D proponents of the most prominent American aerospace corporations to an endless barrage of charges by the Press and the Congress. They were characterized as being disingenuous and accused of being unreasonably secretive during successive appropriations battles in the Congress.

The truth of matter is that the Administration and the Pentagon were not being disingenuous at all. They simply could not admit to the American public that they were attempting to develop an effective response to a weapons system which they did not understand and could not replicate.

There are a number of issues intrinsic to this set of circumstances, along with several dozen others which, though less well known or economically dramatic, are no less important from a technological standpoint. It is certain that the implication of these technologies has not been lost on those multi-national corporations whose entire capital structure may be threatened by the new

sciences, technologies and materials which have been developed in secret laboratories, hidden in caverns excavated beneath the Carpathian Mountains, in the former Soviet Union.

Over the past decade the West has enjoyed occasional gratuitous glimpses into the heart of Soviet science. Attempts to disclose or discuss these developments in the press have been ruthlessly suppressed by powerful special interests vested in both the public and private sectors.

The science which underlies the series of events recounted here remains at the outer limits of the most advanced technology of which the West is capable. The questions posed by the military and corporate analysts about this laser beam weapons system are far-reaching in their scope and implications. Some of them are illustrative:

1) New Model of Quantum Mechanics: The sciences and models of quantum mechanics which produced such stunning recent developments in the West as the laser and maser make quite clear how much energy is required to create a beam of coherent light powerful enough to penetrate the atmosphere, retain its coherence in spite of atmospheric diffraction (and other effects described in quantum mechanics as "thermal blooming"), and melt a two-inch hole clear through a satellite made of the most sophisticated alloys ever produced in the West. Except for limited short-distance demonstrations conducted with industrial grade lasers used in cutting operations, there is no known combination of materials or technologies extant in the West to make such a thing possible.

2) New Materials: The materials necessary to create an electrical charge large enough to power a device capable of producing such a beam certainly do exist. In quantum mechanics the term large enough does not make sense, but we can agree for the purposes of this discussion on the effect of it as represented by such commonly accepted constructs as frequency, voltage, current and ionic flow rates [as distinguished by the phenomenon of resistance].

Hydroelectric plants and large, fixed-base nuclear power plants are capable of producing enough energy to theoretically power such a device. But the energy bursts in both the Carpathians and the Afghan desert were generated by sources which moved from one location to another. In order to do that, several additional considerations must be addressed:

a. Portability: The power source would have to be transportable or be capable of storing sufficient energy to repeatedly power such a device. Western technology cannot produce either a portable power production unit or energy storage system capable of the performance requirements everyone agrees must be met to make the weapons system work, either in the laboratory or in the field. System portability was the most puzzling feature of the NSA/DIA report.

When carefully analyzed, the computer-enhanced enlargements of the photographs taken by the spy satellites and AWAC's crews failed to provide evidence of any tracks which could be attributed to wheeled or tracked vehicles operating in the precise locations and at the same time as the laser bursts which were observed. The implications of this set of circumstances was almost too much to believe – the devices were apparently either hand held or transportable and rechargeable in such a way as to allow them to be transported by one or more foot soldiers, without vehicular support.

b. Enormous Power Requirement: The materials and technologies used to construct a device capable of generating a beam of such enormous power and magnitude would have to be sufficiently advanced to enable the components to be transported without damage over significant distances in unpaved areas of very rough terrain. Such strategies, engineering techniques, construction technologies or materials do not exist in the Western inventory.

c. The continuous repetition of the laser bursts suggests that the devices can be operated repeatedly at short intervals of 12-15 minutes. This means they can be triggered with significantly higher frequency and intensity than anything which can be produced in the West, even for laboratory use. Industrial strength lasers used to cut metals require careful setup, accommodate only limited use in short bursts, require extensive cooling and must be continually recalibrated. These limitations obviously did not apply to the devices being operated in the Afghan desert. Analysts at AMTL agreed that the units would either have to be recharged via an external, independent device or somehow be capable of self-recharging in the field.

Such a thing is almost unthinkable by current Western military standards. Not only can we still not replicate the technology in any meaningful form, but the Soviets had refined the technology to a point which allowed it to be carried on the shoulders of ordinary foot soldiers and recharged in the field without motorized support.

Unbelievable! How was such a thing possible? According to some of the highly qualified scientists who scrutinized the photographs, it is not possible. The "Not Invented Here" syndrome is alive and well in the American engineering community. Some of them still insist that the pictures were either fabricated or demonstrate something completely different than this narrative suggests.

3) Energy Recharge-Batteries: How did such high-intensity laser beam generators get recharged in the middle of the Afghan desert, in the absence of powered support vehicles or fixed-based power plants? There are a number of possible alternatives. They could have been powered by some sort of advanced battery technology. It's possible, but if the battery technology used in the West is used as a model to support such a thesis, it would take a bank of the most sophisticated batteries ever designed by NASA, arrayed in series and parallel configurations larger than five full-sized Soviet T-60 tiger tanks to power such a device.

This theoretical battery bank, operating at 100% efficiency (which is not practically or theoretically possible; the best batteries manufactured in the West operate at less than 60% discharge efficiency), could conceivably produce enough direct current voltage (in a zero resistance super conductive circuit, which is not possible, either) to perhaps produce one burst of light equal in intensity to 20% of the power required to burn a 2-inch hole through a satellite moving at 20,000 miles per hour at a distance of 325 miles.
Soviet ground forces were generating bursts of this magnitude every 12-15 minutes for more than 10 hours with nothing but ground troops. During eight hours of this exchange, it was totally dark. Something pretty remarkable must have been going on to make such a thing possible.

4) Energy Recharge – Solar Cells: Another alternative would have been to have whatever energy storage devices were being used to power the "laser cannons" recharged by sunlight. The state-of-the-art in photo-voltaic cells produced in the West simply would not support such an undertaking. The very best solar cells ever produced in the West have been produced by the Japanese.

These cells operate at a maximum of 19% efficiency - that is, they convert as much as 19% of the ambient visible sunlight shining on a clear, cloudless day into ion flow, which then becomes low voltage direct electrical current flowing through a circuit. The Japanese panels require months per section to manufacture and literally cost more than their weight in gold to manufacture. They are very heavy and are so sensitive to vibration and calibration that once installed, they cannot be moved at all.

Photo-voltaic cells capable of providing enough electricity to recharge a theoretically infinite energy well would have to operate at efficiencies of 50-80% to recharge batteries of infinite electrical capacity with enough power to trigger such a device. Such cells would have to be very light weight and able to withstand extremes of heat, cold, vibration, dust, wind and other conditions encountered in a hostile battlefield environment. Nothing like that exists in the Western technological arsenal.

5) Dielectric Materials – Transformers and Capacitors: Another consideration must be reconciled before this issue can be theoretically put to rest. In order to produce a burst of coherent light of sufficient intensity to have the effect which was observed and recorded by the surveillance teams, the voltage and amperage required to support such a device would have to be staggeringly high. In order to operate at all, the voltage supplied to the system must be released all at once, not in a continuous stream but in a single coherent burst so intense that any materials known in the West would either evaporate or melt. Not only would the best dielectric materials known to Western Science melt because of the heat produced by such enormous energy bursts, but before a bolt of energy of this magnitude could even be released to such a device, it would have to be accumulated and stored somehow.

A similar set of requirements of a less dramatic type is present in all the electronic devices manufactured and marketed in the West. This includes the entire range of electronic devices such as VCR's, computers, televisions and sound components, telecommunications, information storage, transmission and retrieval systems of every kind. We could not live as we do without them. The components which convert, store and release ion flow into the circuitry of these devices are known as transistors, transformers and capacitors.

This discussion delves into a slightly technical area here, so non-scientific types will need to either become familiar with the fundamentals of electricity to understand what is meant or simply give it a possibility that what is developed in the next section is a true representation of the way such things actually operate. The discussion deals with such commonly used and seldom understood concepts as voltage, current, frequencies and resistance.

(a) Transformers convert voltage at one level of current (amperage) to either higher or lower voltage levels. When the voltage is increased, the amperage or current is proportionately decreased. A low voltage produced at a high current level can be transformed into a much higher voltage at a proportionately lower level of current or "power."

(b) Capacitors: The decrease in amperage which accompanies a transformation of low voltage to higher voltage is often compensated for by a device known as a capacitor. In the most simplistic terms, capacitors "store" electrical energy until the amount of voltage and current reach a certain minimal threshold. When that point is reached, the entire store of energy is released all at once in a single burst.

The tantalum materials used in the West to manufacture such devices conform to certain standard rules which are commonly accepted by electrical engineers. These rules have only recently been stretched by new technologies and materials developed in the West. For the purposes of this discussion, though, it is safe to say that electrical engineers have long relied on these rules because they have always produced the same results when applied in the same way. Here's an example.

It is standard engineering fare which dictates that a transformer capable of accommodating one volt at one ampere of current across a grid of one ohm of resistance will be one cubic meter in

dimension. If followed to its logical conclusion, this standard rule of electrical engineering would require that a transformer capable of supporting a laser burst device of the kind operated by the Soviet ground forces in the Afghan desert would have to be approximately the size of a building built on a base 100 feet to a side, nearly 150 feet high.

Surely such a device could not have been hidden from the AWAC's eye in the sky which can clearly photograph the letters on a license plate from 60,000 feet altitude, nor could it have been moved on the shoulders of ground troops without wheeled vehicular support. The fact that there was absolutely no trace of such a huge, massive transformer device (or any other kind of structure or vehicle which could be construed to serve that purpose) means that something else must have been used instead. Military analysts had absolutely no idea what it could have been.

Such a burst system cannot operate without a capacitor of some sort. A capacitive device capable of storing the amount of energy required to power a single burst from a laser cannon, made of the most advanced dielectric material known in the West, would have to have been equally massive and, further, would have to have been cooled by some sort of strategy which would have been instantly and unmistakably detected by the infrared cameras and spectroscopic scanners used aboard the AWAC's and the spy satellites which investigated the scene.

The practical requirements of such a system are best demonstrated by the massive equipment required to operate and cool the Super Conductor Super Collider linear particle accelerators recently designed by the United States and Japan. No evidence of any such capacitive device was recorded in either the Carpathian Mountains or the Afghanistan desert. How can we explain it?

Without going into any detail about how the technologies were developed, suffice it for now to say that the Soviet ground forces in Afghanistan were equipped with a prototype of a hand-held plasma beam accelerator, the likes of which had only been roughly imagined by American military analysts. The device relied on some innovative strategies. Among these were:

Energy Storage Devices: The power source for the Soviet light cannons was comprised of a back-pack array of specially designed energy storage devices. The closest thing we have in our vocabulary to compare to them is described by the term "battery." In the limited sense that these devices store electrical energy, they are batteries. Any other similarity to the batteries we are accustomed to in the West ends there. The literal translation of the Russian name for them is energy accumulators.

The batteries relied on in the West are based on the chemical properties of components which, when combined in certain configurations and proportions, interact chemically with one another. The result of this chemical interaction is that it creates both heat and a stream of liberated ions – electricity. In dry cell batteries, the process of chemical interaction is one way – once they have been expended, they are simply disposed of. It is estimated that more than 12 billion expended dry cell and lead-acid batteries are dumped into America's landfills every year.

Other batteries are designed and constructed so that the chemical reactions which liberate electrical current are reversible in some degree. These rechargeable cells are characterized by the lead-acid batteries which are used in automobiles and in commercial and industrial applications. Various strategies have been developed to make batteries relying on chemical reactions maximally effective, but the theoretical limits of effectiveness of such devices have surely been reached.

A consortium of aerospace companies working with NASA recently announced the development of an advanced sodium-hydride-based rechargeable cell which is the most efficient battery yet invented in the West. Unfortunately, it operates at an ambient temperature of 2000 degrees centigrade and, if allowed to reach temperatures outside a very narrow safe operating zone, will explode with the force of a small thermo-nuclear device of approximately ten-kiloton yield. It is not safe, but it is the best Western science has come up with.

The energy storage device developed by the I.N. Frantsevich Institute for Problems of Materials Science (IPMS), Kiev, Ukraine, works on a completely different principle. Its construction is the result of a completely unique nonlinear quantum mechanical model which makes it possible to create crystalline lattices of absolutely pure carbon (and other materials) in sheets of infinitely variable dimension which are exactly one molecule thick. The crystal formation techniques and the whole body of new science which allows for their creation in the first place are completely unknown to Western science.

The mono-molecular sheets deposited by this technique are wrapped back and forth on top of each other, more than one million times per millimeter, and are separated from each other by a distance of less than one atomic diameter. At this level of construction, the material becomes subject to the rules of quantum mechanics which are almost entirely probabilistic. That means a whole atom of carbon (or almost anything else except an electron or photon) will not fit in the space which separates the lattice sheets.

When viewed under an electron microscope, the sheets produce a pattern which looks for all the world like an endless field of four-sided pyramids, connected base to base, on a single plane, with the tips of the pyramids protruding endlessly, uniformly upwards. When wrapped back and forth on top of each other, these sheets of pure carbon crystal, made of carbon molecules shaped like trillions of identical tiny pyramids, all arrayed endlessly in identical formation, are positioned so that the tips of the pyramids on the bottom sheet are matched with the tips of the pyramids on the top sheets. What remains between the pyramid tips are open “spaces” or energy wells.

The quantum physics which describes the characteristics of the energy wells created between the layers of crystalline lattice is largely unknown to Western physicists. The Soviet model predicts with a high degree of probability that the quanta of energy referred to in the West as electrons (and, in some cases, photons), the stuff of which electricity is made, will, when introduced to the lattice structure, search, find and fit into the energy wells with military precision.

During the recharging or loading phase, the energy storage devices made of the crystalline lattice material channel one electron at a time into each well created by four carbon pyramids on the bottom layer and four carbon pyramids on the top layer. Because the rules of quantum mechanics which operate in this tiny environment demand it, each electron or quanta of energy has a certain polarity, spin and “color” (and other mathematically defined characteristics) which must be accommodated if it is to find, fit and stay in an energy well. Interestingly enough, when a current is applied across the lattice-work structure, the electrons behave precisely as nonlinear quantum mechanics predicts they will. They flow much like a fluid into the lattice field, then separate into individual energy quanta and spin into the last energy well in each layer, automatically adjusting their individual spin, polarity and color to match their characteristics to fit the requirements of each well, until the lattice is full.

Because no chemical reactions are involved in the process of marching electrons into or out of the energy well fields, there is no resistance in the circuit. In the absence of resistance, the electrons fill

the wells at light speed, never missing a space, automatically adjusting polarity, spin and other characteristics, and creating no heat. The amount of time required to "charge" such a cell is less than 5% of the time required to recharge a conventional chemical battery of similar voltage and current.

The validity of $E = MC^2$ is called into question by the way these devices function. When the battery is fully charged, it actually demonstrates more mass than when the energy storage device is empty or discharged. The laws of quantum mechanics relied on in the West state categorically that this is not possible. It is the answer to the question, "How much does a beam of light weigh?"

According to the Soviet model, this is precisely as it should be. When this phenomenon was first demonstrated to scientists in the West who were testing the energy storage devices at INEEL in Idaho, they were thunderstruck. The quanta of energy, or electrons as we refer to them, which are poured into the crystalline lattice demonstrate characteristics of mass even though they are bundles of pure energy sitting in stasis, literally at rest. The characteristic of mass is verifiable – you can measure it by weighing the energy storage devices before and after they are charged. When they are charged, they demonstrate appreciably more mass than when they are fully discharged.

If this is confusing to you, to suggest that pure energy can be shown to demonstrate verifiable mass while at rest (in stasis), perhaps you can begin to appreciate how fundamentally different the physics of all this is when viewed in the terms of Einstein's classic equation $E = MC^2$.

The existence of this technology clearly is proof positive that not only does energy demonstrate the characteristics of mass, but it does so in a state of non-motion or stasis, sitting idly in an energy well. A state of stasis is a very far cry from the terminal theoretical velocity required by the constant in Einstein's equation, equivalent to the square of the speed of light.

The scientific implications of this phenomenon are truly staggering. At very least, the verification of mass as a property of energy quanta at rest suggests that Einstein's theory of relativity may be altogether incorrect as a means of describing the dynamics underlying the real nature of the material world and its relationship to energy.

The existence of this technology suggests at very least, that energy and mass are equivalent characteristics of all things which are manifest in the material world. It is this fundamental contextual difference which distinguishes the Soviet model of quantum mechanics from the Western model. "The proof of the pudding," they say, "is in the eating."

Theoretical physicists may argue endlessly about the validity of the assumptions relied on by the IPMS scientists to develop their unique sciences, technologies and materials. But they cannot argue about the existence of the materials which have arisen from that context. They are as real as they can be. And they are unlike anything ever seen or contemplated in the West.

In the same way energy quanta stored in the energy wells of crystalline lattice materials demonstrate complete mathematical satisfaction with staying there indefinitely, when allowed to flow out in the form of an outgoing wave of electrical discharge, these quanta (electrons or photons, as you prefer) march right back out without resistance at light speed through a closed circuit to another use.

When these energy storage devices are discharged, they demonstrate other attributes which are not known in Western science, and which, because of the very nature of the chemical reactions we are accustomed to, are not theoretically possible according to conventional wisdom. Conventional

chemical batteries, when fully charged, produce electric current at a useable voltage for perhaps 30-40% of the total discharge cycle. After that, either the voltage or amperage (or both) drop to low enough levels that the devices being powered by them cannot recognize or use the electrical current which remains available. At that point, the batteries either have to be recharged or replaced.

The crystal lattice batteries have been demonstrated to produce precisely the same current and voltage levels throughout 98% of their discharge cycle. They produce no heat during discharge, regardless of the rate at which they are discharged. This is absolutely contrary to our experience with batteries, transformers or capacitors. Until the crystalline lattice materials were specifically engineered to register an electronically detectable blip at 95-96% discharge, it was impossible even for the scientists who developed them to distinguish a partially discharged battery from a fully charged one.

There is another characteristic which is intrinsic to energy storage devices which comes into play here. It is a characteristic of materials which is described as energy density. For non-scientific readers, this concept can simply be construed to mean the amount of measurable electrical current which can be produced by any device or material when its mass is converted into electrical energy. The concept is expressed in mathematical formulas as the number of watts and hours of consumable energy which can be converted from each kilogram of material. It is expressed as watt-hours per kilogram.

Here is an example we can all understand. Consider gasoline. When converted into electrical power at 100% efficiency, gasoline has been theoretically shown to have an energy density of between 550 and 600 watt-hours per kilogram of mass. In easy terms, that means that if one kilogram of gasoline were converted into pure electricity at 100% efficiency (with no loss due to heat, resistance, waste, etc.), the reservoir of energy would power a 100-watt light bulb for 5.5 to 6 hours.

Most of the high-end conventional automobile batteries of the lead-acid variety operate at an energy density rate of between 20-25 watt-hours per kilogram. The best NASA sodium-hydride batteries operate at 48-50 watt hours per kilogram. The energy accumulator devices which have been tested at the Idaho National Electronic Laboratories have demonstrated energy densities of between 850 and 1050 watt-hours per kilogram.

What does this mean in practical terms? It means, for one thing, that for the first time in the history of science an energy storage device has been created with an energy density which is greater than gasoline or any other refined fossil fuel. It means that devices which rely on these energy storage technologies can theoretically be designed to store and deliver clean electrical power at higher rates of efficiency than any fossil fuel ever discovered.

The global implications of this technology are irresistible. It means, among other things, that the technology exists, right now, to eliminate the need to build another nuclear power plant or dam another river to produce hydroelectric power. It means we can no longer justify burning another ounce of petroleum, another piece of coal, another cubic centimeter of natural (or unnatural gas) or another tree to produce heat, electricity or power for any purpose, including transportation.

When coupled with the plasma beam devices being tested by the Soviet infantry units in Afghanistan, these energy storage devices operated at such unbelievably high rates of discharge efficiency that they made it possible to repeatedly induce huge electrical discharges in a highly mobile configuration.

The same technologies which were used to produce the energy storage devices have been adapted to create transformers and capacitors with previously unimaginable performance characteristics. Instead of adhering to the conventional western model of "One Volt at One Amp across a resistance of One Ohm equals One Cubic Meter," the Soviets have produced a capacitor which measures more than 1200 farads at 10,000 amperes in a package the size of a tuna sandwich.

When tested by the Technology Materials Testing Laboratory of the Defense Department at the Pentagon and at the I.N.E.E.L. in Idaho, totally new testing equipment had to be designed, engineered and constructed just to test the devices. The scientists at those laboratories had never tested anything like these materials before.

Instead of having to house transformer and capacitor devices in a series of trailers towed by diesel tractors or huge fixed-base facilities, the operating apparatus which supplied transformed power and high intensity capacitive bursts to the light cannons weighed less than ten pounds and could easily be transported in a backpack by a foot soldier.

One final question remains unanswered. "How did the energy storage devices, once dissipated or discharged, become recharged in the field, especially in the dark of night?"

The back-pack plasma beam device detected by the AWAC's during limited combat use in the Afghanistan desert was powered by energy storage devices constructed of crystalline lattice materials. After each laser burst, the energy storage devices were recharged every 12-15 minutes (nearly 45 minutes in the dark of night – the residual ambient heat of the desert is a very efficient source of infrared energy) by sunlight, collected and converted to electricity by four-foot square panels of "solar cell" material arrayed on a pole like a flag, each weighing less than ten ounces.

The electrical energy stored in the back-pack energy accumulators was transformed into enormously high voltages and released at almost unbelievably high current levels when the super-capacitors were sufficiently charged. The beam of "light" detected by the AWAC's crews was a field of plasma, flowing at the speed of light and demonstrating characteristics of mass (and, therefore, kinetic energy). The phenomenon represented by these bolts of lightning are not comprehensible according to the model of quantum mechanics and plasma physics currently being used in the West.

Battery packs utilizing these energy accumulator materials have been designed, produced and tested which provide more than 14 hours of continuously transmitted power on a single charge to conventional hand-held cellular telephone devices. Similar improvements in conventional battery/energy storage capacity have been developed and are being tested for such devices as video camcorders, laptop and portable computers and other similar consumer, commercial, industrial and military applications.

IPMS research in the field of layered crystals has thus led to the creation of capacitors with a very high level of capacitance (measured in farads). This technology is based on a revolutionary production technique which forms polarized surfaces of one molecule thickness, separated by less than one atomic diameter of space, held together by weak Van der Waals energy forces. The special properties created by these layered crystalline structures provide previously unimaginable internal surface areas. Super capacitors are constructed of layered materials numbering more than one million dipole sheets for each millimeter of crystal thickness.

These devices provide a virtually limitless number of charge-discharge cycles at astonishingly rapid charge and discharge rates. The potential impact of such devices on all electronic equipment currently being produced is incalculable, since virtually all electronic devices rely extensively on the West's state-of-the-art tantalum capacitance technologies.

At present, IPMS has on hand (among others) a super-capacitor roughly the size and dimension of a sandwich which develops more than 1,200 farads at 10,000 amperes. It also boasts production of a battery whose active mass energy density exceeds 850 watt-hours per kilogram. For the non-scientist (and all the rest of us as well) this means that a "battery" has been produced which, for the first time in history, produces more power per unit of mass than any fossil fuel ever devised.

Prototype testing of larger-scaled devices designed specifically for providing power to electric vehicles is currently underway. Prototypes are expected to be capable of sustained highway speeds of up to 70 miles per hour with a range of 525 miles on a single charge. The power plant for this application has been recently improved by the inclusion of a proprietary solid-state ceramic electric motor which weighs 7.2 kilograms and produces 100 horsepower on 12-volt direct current. For comparison, an electric vehicle employing a 100-horsepower electric motor performs the same as with a 500-horsepower gasoline engine.

If these performance attainments can be sustained in broad-based applications, electrically powered vehicles could be produced which would meet or exceed virtually all performance characteristics currently available in equipment relying on internal combustion, petroleum-based engines. Gasoline/diesel-powered transportation devices can be replaced by cleaner, more efficient and significantly less expensive alternatives.

The world market for current energy storage applications which will be superseded by these energy storage technologies is estimated to be in excess of $24 billion per year (1991), exclusive of electric vehicle considerations.

Metamatter

9/25/1997 11:16 AM
From: Robert Bass
To: James Bowery<jabowery@netcom.com>;
CC: Robert W. Bass<rbrtbass@pahrump.com>;Gary Vesperman<vman@skylink.net>;
Subject: for the postulated "Bass page"?

Jim,

I just went to http://www.generalstore.com/ and see nothing but "under construction, etc." Is this you, or someone else in another state? Do you know how to (reasonably economically) do Mass-eMailings? Say either from a rented Data Base of known Investors, or just blindly to "millions"?

How about posting the following

Potentially Awesome Speculative Investment Opportunity?
==========
Venture SEED Capital? Low Risk, AWESOME Payback!!!

I seek one or more High-Technology-Oriented "High-Roller" Nerves Investor(s) who would be intrigued by the following proposition (if demonstrably sound and absolutely genuine): Suppose you go to "Super Monte-Carlo" in the sovereign nation of Erehwon, and you come to a table with a Croupier who says:

"I have here a coin the size of a U.S. silver dollar, which is perfectly evenly balanced between Heads and Tails to 10 decimal places [with the edge for Heads in the 11th decimal place]; and a certificate from the US Bureau of Standards certifying it is not "loaded" to favor either Heads or Tails to the best measurements they can make.

"You can flip the coin yourself.

"I have here Certificates of Deposit for $30 Billion in a centuries-old Swiss Bank of spotless reputation.

"My croupier's fee for allowing you to play is ridiculously modest.

"How much are you willing to wager on the honest flip?

"Now suppose the preceding scenario is repeated, except that several of the most reputable scientists in the world assure you that the coin is 'loaded' so that the chances of Heads are between 95% and 99%. Your own experts assure you that you have at worst One Chance in 20 of losing.

"Finally, the croupier says, you may play for $150,000."

To recapitulate, the odds are 20-to-1 that you will win $30 Billion, versus one chance in 20 that your entire $150,000 wager will be lost.

Would you play?

==========
-------PRIVATE Communication-----
------(NOT a Publication)--------
==========

I need Seed Capital of $150,000 under circumstances exactly analagous to those outlined in the Risk/Reward scenario above. If "Heads" comes up, then my patented Plasmasphere technology can be escalated to a Metamatter technology, where by METAMATTER I mean a solid, *crystallized* fully-ionized plasma.

An ordinary crystal has nuclei spaced apart distances of about 10^[-8] cm, the Bohr radius, because the electron cloud makes the atoms behave like little billiard balls of the size indicated.

However, in a plasma, the positively-charge nuclei and the electrons are equal in number, but the electrons are not in orbit around individual nuclei; they are "mixed up" as in a plum-pudding. Most plasma physicists will tell you that in order for hydrogen gas to be fully ionized (i.e., all electrons stripped from all nuclei) the temperature of the gas would have to be above 150,000 degrees Kelvin (i.e., 15 times hotter than the surface of the Sun). But this is demonstrably FALSE (both theoretically and experimentally).

If the gas is dense enough, it can be fully ionized at "low" temperatures, e.g. 5000 Kelvins [so-called "pressure ionization"].

Now suppose that the fully ionized low-temperature gas is condensed into the physical state of a liquid metal. I call this a Liquid Metallic Plasmoid (LMP). The characteristic of an LMP is that, like mercury, it keeps a constant volume; unlike a gas, it does not expand to fill all available space (if in a vacuum). The positive nuclei remain on average equidistant, and the electrons circulate around the dynamic lattice as in a giant crystalline molecule. Cook called it a "Cryscapade"; whereas others might call it a Liquid Crystal.

Fewer than a score people in the world understand that LMPs can exist. One LMP was photographed in half a dozen or so photos on the cover of the Journal of Applied Physics in 1957 by [later] Nitro-Nobel Medalist, physical chemist, Dr. Melvin Cook. The theory by which Cook explained his accidental discovery has been *independently* rediscovered (in 3 separate countries, USA, UK & France) by researchers seeking to explain the illusive natural phenomenon of Ball Lighting.

The late expert on High-Energy Lasers and Shock Tubes, Dr. Jay Blauer of Rockwell Rocketdyne, who died early of leukemia, helped me to design an experiment that would prove beyond shadow of a doubt that LMPs can be created at will. The basic idea is to use a combination of Shock Tube technology and High-Energy Laser technology, with my patented Plasmasphere technology, in order to achieve in a non-self-destructive, reusable device, what Cook discovered accidentally with high-explosives in a self-destructive experiment.

Once the mere EXISTENCE of producible-at-will LMPs is achieved (for the Risk Capital of $150K), it will be trivially easy to raise several million more for refinement of the device to move the LMP into a cryogenic vacuum chamber where (since it is electrically conductive) it can be magnetically levitated and allowed to cool by radiation.

Use of the Brush-Sahlin-Teller Equation of State (used to design the H-bomb) shows that as the LMP cools, its volume contracts, and it becomes more and more dense. There can be shown to scientists sufficiently expert to understand the evidence, a mass of recent experimental evidence (as well as expert theoretical evidence) that before the LMP gets down to room temperature it will crystallize into a Metastable Solid Crystal, namely a *new form of matter* never seen before on Earth!!!

The density will be intermediate between that of ordinary condensed matter and that of neutron stars, wherein a teaspoonful weighs tons.

I propose to manufacture 3 kinds of Micro-Crystals of Metamatter: MSP, MSD, and MSD. Each addresses in a truly *revolutionary* way a trillion-dollar market, with a multi-billion dollar profit potential. In many ways, Metamatter will have a bigger impact on human civilization than any prior discovery, including both computers and atomic energy! In fact, consider the following:

MSP (Meta-Stable Protium [hydrogen]) will be the IDEAL room-temperature Superconductor, which will revolutionized both the Computer/Electronics industry and the Electric Power industry.

MSD (Meta-Stable Deuterium [heavy-hydrogen]) will be the ideal 5th Generation Cold Fusion fuel; when triggered by an infra-red photon of 17.7 eV, a micro-pellet will undergo a phonon-mediated and Lattice-Catalyzed ANEUTRONIC chain-fusion reaction to cleanly release the energy of 10

sticks of dynamite, to make steam for mechanical heat and conversion at 67% efficiency into electrical energy. This can make both homes and automobiles independent of the present electrical utility companies, though they will still need to buy the almost dirt-cheap MSD fuel micro-pellets from Metamatter Industries.

MSH (Meta-Stable Helium) will be the IDEAL rocket propellant for expanding human civilization into the Solar System (e.g. to colonize Mars); when a micro-crystal of MSH is triggered by the right frequency of laser-light, it will return to the form of gas as if it had been compressed by tens of millions of atmospheres of pressure; it will release 43 times more energy per unit weight than any conceivable chemical combination!

During the mid 1980s, the Air Force Systems Command sent a group of 7 or 8 Colonels who held Doctorates in the physical or engineering sciences to scour the USA for 9 months, in groups of 2 or 3, and to report back on what futuristic technology would have the greatest potential impact on the USAF and USA economy by the year 2000 if reduced to actual practice. They listened to 600 industrial and academic presentations and selected MSH as the greatest payoff (for least risk) choice! The USAF Rocket Propulsion Lab was supposed to issue 8 parallel contracts for 8 "crash" projects to see if bulk MSH could be manufactured. I was slated to get one of the 8 contracts, but my approach (through solidifying a helium LMP) was radically different from that of the other 7 selected proposers.

With MSH as fuel, one could take a 50 percent payload to Mars and back in two weeks! (Accelerate there and return at one gee.)

But a Princeton professor of Physics, Will Happer, then Secretary of the JASONS [advisers to DOD/DOE], advanced theoretical arguments which appeared to shoot down the practicality of the other 7 approaches, and the whole project was canceled. But Happer's arguments are totally irrelevant to my approach. Moreover, Happer was later Chief Scientific Advisor to Admiral Watkins (Secretary of DOE) when the ERAB Report was produced.

Those who understand the recent work of Arata and Zhang in which the aneutronic conversion of deuterium nuclei to helium nuclei inside of a palladium lattice is recorded in Real Time (inside of a sealed apparatus which contains a Mass-Spectrometer and which give ZERO helium when the heavy-water deuterium is replaced by ordinary-water hydrogen) know that Aneutronic Cold Fusion (CF) is a demonstrable FACT and that Happer and the ERAB Report were WRONG. Therefore it is logical to consider the possibility that Happer was also wrong when, before he shot down CF, he also shot down MSH.

There is ZERO risk in producing an LMP; it is just that 99.999% of all scientists are ignorant of Cook's work.

There is a slight technical risk in crystallizing an LMP at room-temperature; conceivably, it will remain liquid until below the temperature of liquid nitrogen, in which case my proposal will have been a failure. But the payoff is so AWESOME, and the chances of failure so tiny, that the risk seems worth taking.

I can supply drawings of the Proof-of-Principle Process Prototype Plasmasphere demonstration designed by Dr. Blauer and myself. Jay Blauer told me that he could do the experiment in his spare time evenings and weekends "in two weeks" using shock-tube and laser equipment already in his lab at Rocketdyne, provided he had $10,000 cash for items and materials not on hand.

Several "reputable" labs have explained to me that they would not even consider bidding on doing the Bass-Blauer experiment for less than $100,000. I have personal contacts at 22 government and private labs (such as JPL, SRI, LANL, etc.) which I would like to visit with my former graduate student Dr. Lou Puls (who, unlike me, is an accomplished experimental plasma physicist) to make joint presentations on the theoretical and experimental aspects of creation of an LMP, preparatory to asking them to bid. After 22 weeks spent in such visits, (and paying Dr. Puls Consulting Fees) I expect to have $50,000 left to offer the Highest Bidder. I also expect that no one will bid less than $100,000. But I also expect that out of the 22 presentations, at least several will become so excited that they will offer to Cost Share. In several labs, the working-level scientists interested in LMPs have told me, "If you can get the Management to pay attention, we have in place already a mechanism and a precedent to Cost Share."

Remembering what happened to Fleischmann and Pons it will accomplish naught for me to take the $150K, rent the equipment, and do it in my own garage. Nobody will believe it, and nobody will pay any attention. However, if we spend 6 months getting suitable technical personnel of nationally reputable laboratories excited about the subject of LMPs, and then some lab with the prestige of, say, JPL or LANL or SRI, announces the production of an LMP, many other labs will immediately undertake to "catch up" and to replicate the result at their own expense. Once 3 or 4 labs have announced successful replication, no one will doubt and then it will be trivially easy to raise the venture capital to go from LMPs to solid, crystallized Metamatter micro-crystals of MSP, MSD, and MSH.

I can supply a large amount of written technical material to anyone who is interested in raising the $150,000 seed capital required to get Metamatter Industries off the ground (and for me to file the pioneering Patent Applications, and since I am now licensed to practice Intellectual Property Law before the PTO I can do it myself at no extra expense – as did the physicist/patent-attorney who invented the Xerox process).

This will be BETTER than getting in on the ground floor of Xerox or Polaroid or Microsoft!

Sincerely,

Robert W. Bass, M.A. Oxon, Ph.D.
Dr. Robert W. Bass, Registered Patent Agent 29,130 [ex-Prof Physics]
Inventor: Topolotron, Plasmasphere, issued; QRT Cold Fusion, pending
P.O.Box 1238, Pahrump, NV 89041-1238; phone/FAX (702) 751-0932/0739
Voice-Mail: (702) 387-7213 e-Mail: rbrtbass@pahrump.com

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XXX.YYY
XXX Venture Partners

Dear XXX,
Have you got your _____ Fund off the ground yet? Did you receive the Proposal I sent you last week?

Do you agree that the logic of the Analogy I used for the proposed Low-Risk, AWESOME Payoff, "Proof-of-Principle" (POP) Experiment is sound? If a rational Investor were convinced (e.g. by the photos published by Nitro-Nobel Medalist, Melvin Cook) that it is possible to put a plasma in the state of liquid metal (Liquid Metallic Plasmoids, or LMPs), and that the ONLY risk is that when cooled to room temperature they will not yet crystallize [but won't crystallize until down below, e.g.. the temperature of liquid nitrogen], which risk will be taken by OPM [Other People's Money] when the scientific community realizes that LMPs can be created at will, and that there is ZERO risk in performing the proof-of-principle demonstration experiment to convince them of this fact, and that this can be done for as little as $150,000 (which will also permit Patent Applications ensuring the inside track when LMPs get crystallized), don't you agree that the Reward to Risk Ratio of $3 X 10^[10]/$1.5 X 10^[5] = 2 X 10^[5] multiplied by the probability of crystallization at room temperature (which is supported by hundreds of theoretical papers on MSH and at least one recent paper in Physical Review Lettersw on MSP, as much, much better than 50%), namely an EXPECTED REWARD/RISK RATIO of more than 100,000-to-1 implies that this Proposal is "better" than any proposal made in this field yet, when you note that each of the 3 main products to be manufactured from crystallized LMPs, namely MSP, MSD, and MSH, EACH separately addresses a different Trillion-Dollar Market with a clear Profit Potential of more than $10 Billion?

Moreover, this is a Proposal in which the Investor who RISKS $150K will know within a mere 6 or 7 months WHETHER OR NOT Phase One of his speculation has paid off! (And it is highly likely that the Absolute Answer will be known within another 3 months, considering how fast the scientific community reacts to something, e.g. High-Temperature Superconductors, which is both surprising and EASY to replicate!)

Please tell me when a Speculative Investment Possibility better than this one has last crossed your desk? (I'll bet, NEVER!)

Regards,

Bob Bass

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Electrino Fusion Power Reactor

Gordon L. Ziegler has discovered how to make a clean electrino fusion power reactor capable of generating up to a net of 1880 megawatts of DC electricity. The proposed energy source would produce no carbon emissions and no radioactive wastes. (By reversing the order-to-disorder arrow in the second law of thermodynamics, a $50,000,000 electrino fusion power reactor could be built which would also reverse all aging, disease, and decay processes within a one-mile radius.)

Power output, however, cannot occur in this system without the simultaneous operation of two aspects of the invention. One is an accelerator-collider making a field reversing the order-to-disorder arrow in the second law of thermodynamics in a controlled area. Among other things, that field makes the other aspect of the system (the power source) efficient enough to be self-sustaining and prevents the formation of radioactive wastes.

Electrons are generally regarded to be structure-less spinning point charges. But that contradicts a reasonable postulate that occurred to Gordon L. Ziegler in 1967: “A spherically or cylindrically symmetric smooth charge distribution cannot have detectable spin.” Electrons have detectable spins. Therefore they must not have smooth structure-less symmetric charge distributions. They must be lumpy and have internal structure. An application of the Parsimony Principle shows that they must be composed of two half-charges orbiting each other at the speed of light. The reason scientists concluded that the electron was structure-less was that it could not be blasted apart in collisions up to 700 MeV each particle.

But in Ziegler’s model, electron sub-particles are bound together by confinement by a speed of light barrier (they are trapped going faster than the speed of light). They cannot be blasted apart, even though they are two particles.

The two sub-particles of electrons make a whole different structure for matter than quarks and leptons. The sub-particles can also fuse with each other – making new particles. Fusing sub-particles of positrons reverses the order-to-disorder arrow in the second law of thermodynamics – making the power source efficient enough to be self-sustaining and preventing the radioactive wastes from forming. Fusing the sub-particles of electrons comprise the power source.

Key components include a polarized positron source, injector accelerators, inflection magnets, end magnets, and the beam transport.

Governments and utilities would buy electrino fusion power reactors because the process is a clean, inexpensive way to produce electricity. It is 1000 times as efficient as nuclear reactors. It does not require uranium or plutonium for fuel. It can run on anything for fuel such as dirt, sand, sewage, ground garbage, toxic chemicals, radioactive wastes, sea water, etc. without carbon nor radioactive pollutants.

Assume that the collision energy were 940 MeV to avoid unwanted heat (operate at room temperature), and the current in each beam was 1.0 ampere of electrons. The energy investment into the electrino fusion would be 1880 megawatts. The energy released in annihilation photons would be 3760 megawatts. Recoverable net power would be 1880 megawatts or less.

The collision energy of the linear accelerator would be 940 Mev (each particle – 1880 MeV in the center of mass frame). The current in each beam would be 1.0 amperes of electrons. There would be two beams 180 degrees from each other.

The energy released in annihilation photons would be 3760 megawatts. "Annihilation photons" are the 940 MeV X-Rays produced when a negatron annihilates a proton. These X-rays are converted to electricity by order-to-disorder arrow reversed photo-voltaic cells with nearly 100% efficiency.

In summary the 3760 megawatts output of annihilation photons would be converted to electricity. However, in order to keep the electrino fusion reaction going, 1880 megawatts would be taken from the 3760 megawatts to power the linear accelerator. The net energy output would thus be 1880 megawatts-electric.

The size of an electrino fusion reactor would be about 80 ' x 10' x 10'. The fuel is whatever brass or copper James M. Potter uses in constructing the walls of his linear accelerators. James M. Potter, Ph.D., is President, JP Accelerator Works, Inc., 2245 47th Street, Los Alamos, NM 87544, 505-690-8701 or 888-301-2833 or 505-661-8155, jpotter@jpaw.com, http://www.jpaw.com. 155 lbs of

brass would be consumed over 100 years before shutdown for refueling. The linear accelerator would be a standard commercially available model. It would not need to be customized for an electrino fusion reactor.

The smallest electrino fusion reactor that would be possible to build is now about 80' x 10' x 10'. It may eventually be the size of a filing cabinet.

The projected cost of the first 1880-megawatt electrino fusion reactor is approximately $100 million. This clean source of electricity could be built in two years, and the necessary Refresher built in one year. Electricity could be generated for only about 1.5 percent of current rates (a little over 0.1 cent per kwh). Subsequent clean energy sources can be built for $37.5 million each.

The 1880 megawatts (net) of electricity generated by an electrino fusion power reactor would be Direct Current (DC). A utility would need thick wires and the biggest busbars and transformers on the planet. Conversion from DC to Alternating Current (AC) would require the world's largest inverters.

The electrino fusion reactor requires the Refresher to be self-sustaining. But the Refresher has several positive medical side effects due to reversing the order-to-disorder arrow that cannot be eliminated – in a controlled area reverse adult aging and wipe out diseases.

Refresher 1
Design Specifications

Size of accelerator	20 meters long by 3 meters wide
Diameter of channels	4 cm (maybe a little more to allow for water cooling channels)
Type of accelerator	Folded linear accelerator with pulsed klystron RF power supplies and S-band cavities (2856 MHz)
RF power supplies	Eight 35 to 50-megawatt pulsed klystrons
duty factor	0.1% (peak current 1000 times average current)
Average power	400 kW (20 kW per meter of accelerator)
klystron efficiency	~50%
total system power	800 kW
cooling water requirement for each 5 m section	5 to 10 gpm

cooling water required by each klystron	~ 5 gpm
cooling towers capacity	800 kW

Cost:

Linear accelerator	$12 million
Klystrons	$ 8 million
Klystron power supplies and cooling towers	$ 2 million
Magnets and their power supplies	$ 2 million
System with controls	$ 8 million
10% contingency	$ 3.2 million
Builder's cost	$35.2 million
Other budgeted items	$14.8 million
Total budgeted	$50 million

Creation time total	3 years
Design time (beam dynamics, rf power systems, cooling, and computer control)	1 year
Fabrication and subassembly testing	18 months
Installation and commissioning	6 months

(The following chapter is taken from *Formulating the Universe*, Volume II, by Gordon Ziegler, Chapter 7. Copyrighted by Benevolent Enterprises 2004. Used with permission.)

Chapter 7

SECOND LAW OF THERMODYNAMICS

A. Introduction

Everything goes from a state of order to more disorder. Brand new automobiles wear out and rust. Objects break or are damaged. A thermos bottle falls off the counter, and the inner glass bottle is shattered. We do not expect the shattered bottle to fall back up to the counter and become whole again. There is a one-way arrow for the events to transpire. That arrow is the Second Law of Thermodynamics.

Houses grow old and fall into decay. Barns fall down. Fruit spoils, people and animals grow old and die. Viruses mutate. People become ill and die. Crime and disorder in society increase. Homes break up. Aborted fetuses disintegrate. Dead people and things decompose. All of these negative occurrences are the outworking of the second law of thermodynamics – that part of which is an arrow making everything go from order to disorder.

Let us consider what other people have written about the second law of thermodynamics.

"Second law of thermodynamics

"An equilibrium macrostate of a system can be characterized by a quantity S (called *entropy*) which has the following properties:

"(i) In any infinitesimal quasi-static process in which the system absorbs heat dQ, its entropy changes by an amount

$$dS = \frac{dQ}{T} \qquad (7\text{-}1)$$

where T is a parameter characteristic of the macrostate of the system and is called its *absolute temperature*.

"(ii) In any process in which a thermally isolated system changes from one macrostate to another, its entropy tends to increase, i.e.,

$$\Delta S \geq 0. \qquad (7\text{-}2)$$

"The relation (7-1) is important because it allows one to determine entropy *differences* by measurements of absorbed heat and because it serves to characterize the absolute temperature T of a system. The relation (7-2) is significant because it specifies the direction in which nonequilibrium situations tend to proceed."[1]

The above expression of the second law of thermodynamics is regarding entropy and heat. Other writers include the order-to-disorder arrow in the second law of thermodynamics.

"It is a matter of common experience that disorder will tend to increase if things are left to themselves. (One has only to stop making repairs around the house to see that!) One can create order out of disorder (for example, one can paint the house), but that requires expenditure of effort or energy and so decreases the amount of ordered energy available.

"A precise statement of this idea is known as the second law of thermodynamics. It states that the entropy of an isolated system always increases, and that when two systems are joined together, the entropy of the combined system is greater than the sum of the entropies of the individual systems. For example, consider a system of gas molecules in a box. The higher the temperature of the gas, the faster the molecules move, and so the more frequently and harder they collide with the walls of the box and the greater the outward pressure they exert on the walls. Suppose that initially the molecules are all confined to the left-hand side of the box by a partition. If the partition is then removed, the molecules will tend to spread out and occupy both halves of the box. At some later time they could, by chance, all be in the right half or back in the left half, but it is overwhelmingly more probable that there will be roughly equal numbers in the two halves. Such a state is less ordered, or more disordered, than the original state in which all the molecules were in one half. One therefore says that the entropy of the gas has gone up. Similarly, suppose one starts with two boxes, one containing oxygen molecules and the other containing nitrogen molecules. If one joins the boxes together and removes the intervening wall, the oxygen and nitrogen molecules will start to mix. At a later time the most probable state would be a fairly uniform mixture of oxygen and nitrogen molecules throughout the two boxes. This state would be less ordered, and hence have more entropy, than the initial state of two separate boxes."[2]

"The explanation that is usually given as to why we don't see broken cups gathering themselves together off the floor and jumping back onto the table is that it is forbidden by the second law of thermodynamics. This says that in any closed system disorder, or entropy, always increases with

time. In other words, it is a form of Murphy's law: Things always tend to go wrong! An intact cup on the table is a state of high order, but a broken cup on the floor is a disordered state. One can go readily from the cup on the table in the past to the broken cup on the floor in the future, but not the other way round.

"The increase of disorder or entropy with time is one example of what is called an arrow of time, something that distinguishes the past from the future, giving a direction to time."[3]

B. Electrino Model and 2nd Law

The natural tendency of leptons in beta decay is that the parent lepton combines with one or more gravitons to produce more particles. In all natural reactions, the order energy of the resultant particles is less than or equal to the order energy of the original particles.

1. Negative Energies. Let us consider antimatter more carefully. "In the Dirac theory also, *the permissible energy values for a free particle range from $+mc^2$ to + 4 and from $-mc^2$ to - 4.* The first of these results is of course just what we expect for a free particle – that its total energy can have any value greater than its rest energy. But the second result is quite puzzling, since it implies the existence of states of *negative total energy.*"[4] Anderson in 1932 discovered positrons in cosmic radiation. These were regarded as Dirac's negative energy particles. "The first two solutions of the Dirac equation . . . clearly describe a free electron of energy E and momentum **p**. The two negative energy electron solutions . . . are to be associated with the antiparticle, the positron."[5]

However, in the annihilation it is not $(+mc^2) + (-mc^2) = 0$, but $2mc^2$ is the result of annihilation.[6] There is something strange going on with the minus signs in these equations. The calculations are inconsistent.

Maybe there are two kinds of energy considered. One we can call entropy energy E_S. In the annihilation reaction, $\#+mc^2\# + \#-mc^2\# = 2mc^2$. Entropy energy is the higher value. The other energy is order energy E_O. In order energy the same reaction is $(+mc^2) + (-mc^2) = 0$.

Let us consider entropy energy and order energy for particle decay schemes. There are a few decay schemes where no negative order energy (anti-matter) is introduced in the right hand side of the decay schemes. In those few instances, the final order energy is equal to the initial order energy (when kinetic energy is taken into account). But in most cases, a trace of negative order energy (anti-matter) is introduced into the right side of the decay schemes. There is nothing on the left hand sides of the decay schemes to correspond to this addition of a trace of negative order energy on the right sides of the decay schemes. Therefore, total order energy is less on the right hand sides of the decay schemes than on the left hand sides (if only by a trace). A few decay schemes introduce a lot of antimatter (as K^-) on the right side of the decay scheme. The loss of order energy in the systems is greater in those cases. But in every case, for all natural processes, the order energy final is # the order energy initial, or

$$\Delta E_0 \leq 0. \qquad (7\text{-}3)$$

Let us check the order energy for electron electrino fusion reactions. Electrons made energetic by acceleration (as heavy as protons) fuse and form anti-protons. Matter is converted to anti-matter. Entropy energy is conserved, but not so order energy. Order energy is reduced in the extreme from +938 MeV to -938 MeV or more for each electron fused (two electrons are fused in each reaction).

The order-to-disorder arrow for electron electrino fusion points in the usual direction. The system does obey the second law of thermodynamics.

2. Reversing the Order-to-Disorder Arrow. What would happen if we fused the electrino constituents of positrons instead of the electrino constituents of electrons? Entropy energy E_S would again be conserved. Entropy would be increased. However, order energy E_O would go from -2 x 938 MeV to +2 x 938 MeV – from disorder to order. The order-to-disorder arrow would be reversed. This would be a reaction that would be prohibited by the second law of thermodynamics – unless the strong gravitational force that fuses the anti-semions would be stronger than the second law of thermodynamics (which otherwise governs weak interactions). The stronger of the strong gravitational force and the second law of thermodynamics should be determined by experiment. More rides on that one experiment than perhaps on any one other experiment in this generation. If it is found that strong gravity is stronger than the second law of thermodynamics, then order can be restored at first in a small area, and then for the whole earth.

Here we see that the entropy arrow of time and the order-to-disorder arrow of time are separate and distinct, and are not one and the same thing. While all the reactions the author has studied increase entropy, the fusion of positron anti-semions reverses the order-to-disorder arrow, making more order out of the disorder.

Positron constituent electrino fusion might not only take the electrinos from disorder to order. It could make other physical processes in a local area go from disorder to order. The positron fusion not only violates the second law of thermodynamics, it reverses the order-to-disorder arrow of that law in a local area, making other processes in that area reverse. Let us consider that process more to see how it might be regulated.

We guess the desired relationships for reversing the order-to-disorder arrow in the second law of thermodynamics through dimensional analysis. We want to solve for r, the maximum radius in which the reversed law would be effective. There is a way we can obtain a length from combinations of our variables and constants. That way is in the right hand side of Eq. (7-4). The whole expression is the thermodynamic relation we are seeking. The thermodynamic relation is:

$$(\Delta E_o)_t > 0 \ \textit{where} \ r < \frac{(\Delta E_o)_1 \ c}{ik}, \qquad (7\text{-}4)$$

where E_o is the order energy – the positive or negative energy in the pair production of particles; ΔE_o is the change in the order energy, where $(\Delta E_o)_t$ is the change in the total order energy of the system, and where $(\Delta E_o)_1$ is the change in the order energy for a single source reaction – for a positron fusion reaction it is approximately 2 x 10^9 eV/collision x 1.6 x 10^{-19} joules/eV = 3.2 x 10^{-10} joules/collision; c is the speed of light – approximately 3.0 x 10^8 m/s; we shall solve for the effected radius r; i is the beam current in each beam in Coulombs per second (we will solve for 10^{-11}); k is the ratio of particle energy to particle charge. This energy per charge is the accelerated energy of the particle (roughly 1 x 10^9 ev times 1.6 x 10^{-19} joules/ev = 1.6 x 10^{-10} joules) divided by the charge of each positron (q = 1.6 x 10^{-19} coulombs), which equals 10^9 joules per coulomb. The collision efficiency eff is not needed in this equation, because the result is not in particles, but is already in collisions.

Incredibly, the lower the current, the bigger is the radius of the affected area. The greater the current, the smaller is the radius of the effected area. With 10^{-11} A beam currents, the effected

radius r solves for 9.6 meters – roughly 10 meters, which describes a small area – less than a tenth of an acre.

To get an idea of the positron beam currents needed to reverse the order-to-disorder arrow of the second law of thermodynamics in what size of affected radius, see Table 7-1 below.

For an area the size of	r	beam current
House	10 m	10 pA
four football fields	100 m	1 pA
community	1 km	100 fA
city	10 km	10 fA
Israel	160 km	0.6 fA
U.S.	2,400 km	0.04 fA
World	13,000 km	0.008 fA
Sun	1.7E11 m	6E-22 A

Table 7-1. Beam currents versus affected radius for reversal of the order-to-disorder arrow of the second law of thermodynamics.

We must make sure that reversing the second law will do only good and not evil before we flip the switch. Inspired evidences will be studied in the next chapter on a wide range of phenomena affected by reversing the order-to-disorder arrow in the second law of thermodynamics.

---

[1]F. Reif, *Statistical Physics*, Berkeley Physics Course--Volume 5 (New York: McGraw-Hill Book Company, 1967), p. 283.

[2]Stephen Hawking, *A Brief History of Time*--From the Big Bang to Black Holes (New York: Bantam Books, 1988), pp. 102, 103.

[3]*Ibid.*, pp. 144, 145.

[4]Robert B. Leighton, *Principles of Modern Physics* (New York: McGraw-Hill Book Company, Inc, 1959), p. 665.

[5]Francis Halzen, Alan D. Martin, *Quarks and Leptons* (New York: John Wiley & Sons, 1984), p. 107.

[6]David S. Saxon, *Elementary Quantum Mechanics* (San Francisco: Holden-Day, 1968), p. 386.

(End of Chapter 7)

EXECUTIVE SUMMARY OF BUSINESS PLAN

electrino energy is a new company formed to develop the inventions envisioned by the new model of physics—the electrino fusion model of elementary particles. Our company provides theoretical work and guidance to licensees. Our focus is the reverser of aging, disease, and decay processes (Refresher 1) and whatever else we must do to fund the Refresher 1.

electrino energy was formed October 12, 2005 as an invention development and theorist service specializing in four high-technology inventions – inertia-less craft; artificial gravities; reverser of aging, disease, and decay processes; and electrino fusion reactors generating electricity. All four inventions have potentially extremely high value. But all four inventions currently have three principle difficulties: 1) they are unbelievable by almost all persons – including agency heads, venture capitalists, congressmen and senators; 2) almost all of them cost scores of millions of dollars to develop; and 3) **electrino energy** has no money to develop them. With no capital and no revenue stream or other assets to fall back on, **electrino energy** cannot even get a guaranteed loan.

But **electrino energy** is not resource-less and in a hopeless condition. It has three principal approaches that it can take to resolve this dilemma:

1) Though the aging reverser is the most urgently needed, a miniature inertia-less craft can be constructed for a whole lot less money. It should be possible to construct one for a few hundred dollars borrowed from friends. But that technology could be licensed for hundreds of millions of dollars – enough to finance all the four high-tech inventions.

2) As a back-up to that approach, venture capital angels could be approached to advance the money to finance the reverser of aging, disease, and decay processes. This invention is not only high tech, but medical. The other inventions could be developed at a later time.

3) As a back-up to that approach, the owner could pursue his particle theory, predicting the masses of particles. That may be difficult, but not impossible. This would do what no other physical theory can do. Such a feat would be publishable, arousing interest among scientists for creating a facility to test the model – opening the way for government funding of the high-tech inventions.

A master decision tree flow chart linking and employing these three alternatives for funding the development of the inventions is in Section 7.0 Financial Plan.

According to alternative 1), projected sales and profits for the first four years of operation are summarized below:

Year	Sales($)	Profits($)	Profit/Sales(%)
1	200,000,000	0	0
2	0	0	0
3	0	0	0
4	10,000,000,000	9,000,000,000	90.0

According to alternative 2), there are no actual projected sales and profits for the first three years of operation. Year four is the same as above. According to alternative 3), there are no projected sales or profits for the first five years.

Currently, there are no competitors for any of these inventions. Once public incredulity is overcome by demonstration, the devices should have huge market potential.

The size of the electricity generating market is essentially enormous. It would be up to 50 percent of electric generation world-wide eventually. That's probably over a trillion dollars.

A self-powered high-speed locomotive powered by an electrino fusion power reactor would need to be at least 85 feet long.

Environmental Heat Engines

Las Vegas inventor Robert Stewart developed his "Stewart Cycle" engine for transportation vehicles, electricity generators, and large-scale water lifters. His efficient and pollution-free engine uses ambient heat to expand a working fluid such as Freon or ammonia and move pistons through sealed chambers. His patent is for Vapor Actuated Power Generating Device, No. 4,033,136.

A possibly more up-to-date version is Ralph J. Lagow's Method of Generating Power from a Vapor, Patent No. 4,693,087. Ken Rauen's Rauen cycle and Superclassical cycle engines also expand working fluids with environmental heat to provide useful net mechanical power.

Mr. Stewart claimed that his fuel-less engine could lift Colorado River water from below Hoover Dam back up into Lake Mead, thereby doubling Hoover Dam's output of electricity. He also proposed lifting water from the Columbia River into the Colorado River via a canal, generating electricity as the water flowed back downhill.

Thank you for your comment, Gary Vesperman.

The comment tracking number that has been assigned to your comment is SEDDsupp20015.

Comment Date: December 1, 2011 22:09:09PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20015

First Name: Gary
Middle Initial:
Last Name: Vesperman
Organization:
Address: 588 Lake Huron Lane
Address 2:
Address 3:
City: Boulder City
State: NV
Zip: 890051018
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Locomotive_Power_Sources.docx

Comment Submitted:

(I left out part of the conclusion of a previous comment re metamatter.
This is the correct version. Sorry for the inconvenience. Gary)

Attached is my compilation of candidate power sources for high-speed rail locomotives. It is available in my website www.padrak.com/vesperman. Pages 28-33 has this description of metamatter:

Metamatter

9/25/1997 11:16 AM
From: Robert Bass
To: James Bowery
jabowery@netcom.com;
CC: Robert W. Bass rbrtbass@pahrump.com;
Gary Vesperman
vman@skylink.net;
Subject: for the postulated "Bass page"?

Jim,

I just went to http://www.generalstore.com/ and see nothing but "under construction, etc." Is this you, or someone else in another state? Do you know how to (reasonably economically) do Mass-eMailings? Say either from a rented Data Base of known Investors, or just blindly to "millions"?

How about posting the following

Potentially Awesome Speculative Investment Opportunity?
==========
Venture SEED Capital? Low Risk, AWESOME Payback!!!

I seek one or more High-Technology-Oriented "High-Roller" Nerves Investor(s) who would be intrigued by the following proposition (if demonstrably sound and absolutely genuine): Suppose you go to "Super Monte-Carlo" in the sovereign nation of Erehwon, and you come to a table with a Croupier who says:

"I have here a coin the size of a U.S. silver dollar, which is perfectly evenly balanced between Heads and Tails to 10 decimal places [with the edge for Heads in the 11th decimal place]; and a certificate from the US Bureau of Standards certifying it is not "loaded" to favor either Heads or Tails to the best measurements they can make.

"You can flip the coin yourself.

"I have here Certificates of Deposit for $30 Billion in a centuries-old Swiss Bank of spotless reputation.

"My croupier's fee for allowing you to play is ridiculously modest.

"How much are you willing to wager on the honest flip?

"Now suppose the preceding scenario is repeated, except that several of the most reputable scientists in the world assure you that the coin is 'loaded' so that the chances of Heads are between 95% and 99%. Your own experts assure you that you have at worst One Chance in 20 of losing.

"Finally, the croupier says, you may play for $150,000."

To recapitulate, the odds are 20-to-1 that you will win $30 Billion, versus one chance in 20 that your entire $150,000 wager will be lost.

Would you play?

==========
--------PRIVATE Communication-----
------(NOT a Publication)--------
==========

I need Seed Capital of $150,000 under circumstances exactly analagous to those outlined in the Risk/Reward scenario above. If "Heads" comes up, then my patented Plasmasphere technology can be escalated to a Metamatter technology, where by METAMATTER I mean a solid, crystallized fully-ionized plasma.

An ordinary crystal has nuclei spaced apart distances of about 10^[-8] cm, the Bohr radius, because the electron cloud makes the atoms behave like little billiard balls of the size indicated.

However, in a plasma, the positively-charge nuclei and the electrons are equal in number, but the electrons are not in orbit around individual nuclei; they are "mixed up" as in a plum-pudding. Most plasma physicists will tell you that in order for hydrogen gas to be fully ionized (i.e., all electrons stripped from all nuclei) the temperature of the gas would have to be above 150,000 degrees Kelvin (i.e., 15 times hotter than the surface of the Sun). But this is demonstrably FALSE (both theoretically and experimentally). If the gas is dense enough, it can be fully ionized at "low" temperatures, e.g. 5000 Kelvins [so-called "pressure ionization"].

Now suppose that the fully ionized low-temperature gas is condensed into the physical state of a liquid metal. I call this a Liquid Metallic Plasmoid (LMP). The characteristic of an LMP is that, like mercury, it keeps a constant volume; unlike a gas, it does not expand to fill all available space (if in a vacuum). The positive nuclei remain on average equidistant, and the electrons circulate around the dynamic lattice as in a giant crystalline molecule. Cook called it a "Cryscapade"; whereas others might call it a Liquid Crystal.

Fewer than a score people in the world understand that LMPs can exist. One LMP was photographed in half a dozen or so photos on the cover of the Journal of Applied Physics in 1957 by [later] Nitro-Nobel Medalist, physical chemist, Dr. Melvin Cook. The theory by which Cook explained his accidental discovery has been independently rediscovered (in 3 separate countries, USA, UK & France) by researchers seeking to explain the illusive natural phenomenon of Ball Lighting.

The late expert on High-Energy Lasers and Shock Tubes, Dr. Jay Blauer of Rockwell Rocketdyne, who died early of leukemia, helped me to design an experiment that would prove beyond shadow of a doubt that LMPs can be created at will. The basic idea is to use a combination of Shock Tube technology and High-Energy Laser technology, with my patented Plasmasphere technology, in order to achieve in a non-self-destructive, reusable device, what Cook discovered accidentally with high-explosives in a self-destructive experiment.

Once the mere EXISTENCE of producible-at-will LMPs is achieved (for the Risk Capital of $150K), it will be trivially easy to raise several million more for refinement of the device to move the LMP into a cryogenic vacuum chamber where (since it is electrically conductive) it can be magnetically levitated and allowed to cool by radiation.

Use of the Brush-Sahlin-Teller Equation of State (used to design the H-bomb) shows that as the LMP cools, its volume contracts, and it becomes more and more dense. There can be shown to scientists sufficiently expert to understand the evidence, a mass of recent experimental evidence (as well as expert theoretical evidence) that before the LMP gets down to room temperature it will crystallize into a Metastable Solid Crystal, namely a new form of matter never seen before on Earth!!!

The density will be intermediate between that of ordinary condensed matter and that of neutron stars, wherein a teaspoonful weighs tons.

I propose to manufacture 3 kinds of Micro-Crystals of Metamatter: MSP, MSD, and MSD. Each addresses in a truly revolutionary

way a trillion-dollar market, with a multi-billion dollar profit potential. In many ways, Metamatter will have a bigger impact on human civilization than any prior discovery, including both computers and atomic energy! In fact, consider the following:

MSP (Meta-Stable Protium [hydrogen]) will be the IDEAL room-temperature Superconductor, which will revolutionized both the Computer/Electronics industry and the Electric Power industry.

MSD (Meta-Stable Deuterium [heavy-hydrogen]) will be the ideal 5th Generation Cold Fusion fuel; when triggered by an infra-red photon of 17.7 eV, a micro-pellet will undergo a phonon-mediated and Lattice-Catalyzed ANEUTRONIC chain-fusion reaction to cleanly release the energy of 10 sticks of dynamite, to make steam for mechanical heat and conversion at 67% efficiency into electrical energy. This can make both homes and automobiles independent of the present electrical utility companies, though they will still need to buy the almost dirt-cheap MSD fuel micro-pellets from Metamatter Industries.

MSH (Meta-Stable Helium) will be the IDEAL rocket propellant for expanding human civilization into the Solar System (e.g. to colonize Mars); when a micro-crystal of MSH is triggered by the right frequency of laser-light, it will return to the form of gas as if it had been compressed by tens of millions of atmospheres of pressure; it will release 43 times more energy per unit weight than any conceivable chemical combination!

During the mid 1980s, the Air Force Systems Command sent a group of 7 or 8 Colonels who held Doctorates in the physical or engineering sciences to scour the USA for 9 months, in groups of 2 or 3, and to report back on what futuristic technology would have the greatest potential impact on the USAF and USA economy by the year 2000 if reduced to actual practice. They listened to 600 industrial and academic presentations and selected MSH as the greatest payoff (for least risk) choice! The USAF Rocket Propulsion Lab was supposed to issue 8 parallel contracts for 8 "crash" projects to see if bulk MSH could be manufactured. I was slated to get one of the 8 contracts, but my approach (through solidifying a helium LMP) was radically different from that of the other 7 selected proposers.

With MSH as fuel, one could take a 50 percent payload to Mars and back in two weeks! (Accelerate there and return at one gee.)

But a Princeton professor of Physics, Will Happer, then Secretary of the JASONS [advisers to DOD/DOE], advanced theoretical arguments which appeared to shoot down the practicality of the other 7 approaches, and the whole project was canceled. But Happer's arguments are totally irrelevant to my approach. Moreover, Happer was later Chief Scientific Advisor to Admiral Watkins (Secretary of DOE) when the ERAB Report was produced.

Those who understand the recent work of Arata and Zhang in which the aneutronic conversion of deuterium nuclei to helium nuclei inside of a palladium lattice is recorded in Real Time (inside of a sealed apparatus which contains a Mass-Spectrometer and which give ZERO helium when the heavy-water deuterium is replaced by ordinary-water hydrogen) know that Aneutronic Cold Fusion (CF) is a demonstrable FACT and that Happer and the ERAB Report were WRONG. Therefore it is logical to consider the possibility that Happer was also wrong when, before he shot down CF, he also shot down MSH.

There is ZERO risk in producing an LMP; it is just that 99.999% of all scientists are ignorant of Cook's work.

There is a slight technical risk in crystallizing an LMP at room-temperature; conceivably, it will remain liquid until below the temperature of liquid nitrogen, in which case my proposal will have been a failure. But the payoff is so AWESOME, and the chances of failure so tiny, that the risk seems worth taking.

I can supply drawings of the Proof-of-Principle Process Prototype Plasmasphere demonstration designed by Dr. Blauer and myself. Jay Blauer told me that he could do the experiment in his spare time evenings and weekends "in two weeks" using shock-tube and laser equipment already in his lab at Rocketdyne, provided he had $10,000 cash for items and materials not on hand.

Several "reputable" labs have explained to me that they would not even consider bidding on doing the Bass-Blauer experiment for less than $100,000. I have personal contacts at 22 government and private labs (such as JPL, SRI, LANL, etc.) which I would like to visit with my former graduate student Dr. Lou Puls (who, unlike me, is an accomplished experimental plasma physicist) to make joint presentations on the theoretical and experimental aspects of creation of an LMP, preparatory to asking them to bid. After 22 weeks spent in such visits, (and paying Dr. Puls Consulting Fees) I expect to have $50,000 left to offer the Highest Bidder. I also expect that no one will bid less than $100,000. But I also expect that out of the 22 presentations, at least several will become so excited that they will offer to Cost Share. In several labs, the working-level scientists interested in LMPs have told me, "If you can get the Management to pay attention, we have in place already a mechanism and a precedent to Cost Share."

Remembering what happened to Fleischmann and Pons it will accomplish naught for me to take the $150K, rent the equipment, and do it in my own garage. Nobody will believe it, and nobody will pay any attention. However, if we spend 6 months getting suitable technical personnel of nationally reputable laboratories excited about the subject of LMPs, and then some lab with the prestige of, say, JPL or LANL or SRI, announces the production of an LMP, many other labs will immediately undertake to "catch up" and to replicate the result at their own expense. Once 3 or 4 labs have announced successful replication, no one will doubt and then it will be trivially easy to raise the venture capital to go from LMPs to solid, crystallized Metamatter micro-crystals of MSP, MSD, and MSH.

I can supply a large amount of written technical material to anyone who is interested in raising the $150,000 seed capital required to get Metamatter Industries off the ground (and for me to file the pioneering Patent Applications, and since I am now licensed to practice Intellectual Property Law before the PTO I can do it myself at no extra expense – as did the physicist/patent-attorney who invented the Xerox process).

This will be BETTER than getting in on the ground floor of Xerox or Polaroid or Microsoft!

Sincerely,

Robert W. Bass, M.A. Oxon, Ph.D.
Dr. Robert W. Bass, Registered Patent Agent 29,130 [ex-Prof Physics]
Inventor: Topolotron, Plasmasphere, issued; QRT Cold Fusion, pending
P.O.Box 1238, Pahrump, NV 89041-1238; phone/FAX (702) 751-0932/0739
Voice-Mail: (702) 387-7213 e-Mail: rbrtbass@pahrump.com

==========

XXX.YYY
XXX Venture Partners

Dear XXX,
Have you got your _____ Fund off the ground yet? Did you receive the Proposal I sent you last week?
Do you agree that the logic of the Analogy I used for the proposed Low-Risk, AWESOME Payoff, "Proof-of-Principle" (POP) Experiment is sound? If a rational Investor were convinced (e.g. by the photos published by Nitro-Nobel Medalist, Melvin Cook) that it is possible to put a plasma in the state of liquid metal (Liquid Metallic Plasmoids, or LMPs), and that the ONLY risk is that when cooled to room temperature they will not yet crystallize [but won't crystallize until down below, e.g.. the temperature of liquid nitrogen], which risk will be taken by OPM [Other People's Money] when the scientific community realizes that LMPs can be created at will, and that there is ZERO risk in performing the proof-of-principle demonstration experiment to convince them of this fact, and that this can be done for as little as $150,000 (which will also permit Patent Applications ensuring the inside track when LMPs get crystallized), don't you agree that the Reward to Risk Ratio of $3 X 10^[10]/$1.5 X 10^[5] = 2 X 10^[5] multiplied by the probability of crystallization at room temperature (which is supported by hundreds of theoretical papers on MSH and at least one recent paper in Physical Review Lettersw on MSP, as much, much better than 50%), namely an EXPECTED REWARD/RISK RATIO of more than 100,000-to-1 implies that this Proposal is "better" than any proposal made in this field yet, when you note that each of the 3 main products to be manufactured from crystallized LMPs, namely MSP, MSD, and MSH, EACH separately addresses a different Trillion-Dollar Market with a clear Profit Potential of more than $10 Billion?

Moreover, this is a Proposal in which the Investor who RISKS $150K will know within a mere 6 or 7 months WHETHER OR NOT Phase One of his speculation has paid off! (And it is highly likely that the Absolute Answer will be known within another 3 months, considering how fast the scientific community reacts to something, e.g. High-Temperature Superconductors, which is both surprising and EASY to replicate!)

Please tell me when a Speculative Investment Possibility better than this one has last crossed your desk? (I'll bet, NEVER!)

Regards,

Bob Bass

Dr. Robert W. Bass, Registered Patent Agent 29,130 [ex-Prof Physics]
Inventor: Topolotron, Plasmasphere, issued; QRT Cold Fusion, pending
P.O.Box 1238, Pahrump, NV 89041-1238; phone/FAX (702) 751-0932/0739
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(End of excerpt)

This Draft Solar PEIS should thoroughly and honestly compare the cost-effectiveness of a World War II Manhattan Project-styled crash program to quickly develop and commercialize energy inventions based on the above versions of metamatter with covering and ruining millions of acres with relatively inefficient and expensive solar energy collectors and transmission lines.

(If you have difficulty contacting Dr. Bass, email me, Gary Vesperman, at garyvesperman@yahoo.com. He called me a few months ago from Dallas (?). What I have of his phone numbers are 817-682-2655, 817-377-7638, and 817-370-7109. I also have his current email address.)

Locomotive Power Sources

High-speed trains typically rely on some means of supplying energy to the locomotive from an external source. For example, cumbersome overhead electric lines are tapped to directly power a locomotive's electric drive wheels. Another method of connecting the locomotive to an electricity grid is with a dangerously exposed high-voltage third electrified rail. Linear magnetic propulsion mechanisms have been researched.

It would be much cheaper and easier to build and operate high-speed trains if their locomotives utilize an internal practically fuel-less power source.

The following candidate high-speed locomotive power sources appear worthy of further research. Some may be found to be worthwhile for building and testing prototype self-powered locomotives.

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Blue Energy Corporation
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TABLE OF CONTENTS

BlackLight Power's Hydrino Generator

BlackLight Power, Inc., is developing an exotic new source of clean energy from ordinary water. Either an electrolytic cell or gaseous potassium ions in a vacuum compress hydrogen atoms into lower-energy-state hydrogen atoms called "hydrinos". When the hydrinos are formed, energy is released which in magnitude is between chemical and nuclear energy. BlackLight Power, Inc., has ambitious plans for retrofitting fossil-fueled and nuclear power plants.

BlackLight Power, Inc., is developing a 100-kilowatt generator which can power a car 100,000 miles on a tank of water. BlackLight Power, Inc., claimed some years ago that it is developing a 10-kilogram battery which can supply 150 horsepower for 1,000 miles.

BlackLight Power, Inc., has already licensed 8,250 megawatts of clean, safe hydrino generation fueled by water to seven utilities (Hoover Dam's nameplate capacity is 2,080 megawatts) – eliminating $2 billion/year in fuel costs.

Focus Fusion

See http://www.focusfusion.org/. Apparently this method is much less expensive than hot fusion.

Thorium PowerPack

Bob Dratch's thorium powerpack would generate electricity at approximately one-tenth of the cost of current methods of producing electricity. Thorium is sufficiently abundant that the entire planet can be powered for millennia. After ten years of continuous operation, a trace amount of U-233 is produced. U-233 recovery to re-purify the thorium is easily accomplished. Thorium thus lasts a long time when recycled and consequently is a very efficient energy source. After extraction from ore, thorium does not require energy-intensive enrichment as is the case with uranium.

A thorium-powered reactor is inherently safe. It doesn't run the risk of "meltdown" or explosion nor can even a dirty bomb be created. Its nuclear reaction simply stops when its neutron exciter is turned off.

The simplest and smallest "table top-sized " neutron exciter design is something close to the size of a 4-D cell flashlight, and starts at about 500-kilovolt neutron output. In fact this smallest most cost-effective system can run off 4 D cells for its power.

A thorium powerpack's neutron excitor does not use radioactive flux components as conventionally done for portable systems. Instead it relies on Dratch's invention of a novel method of resonant phonon pair cleavage using specifically designed nuclear lattice holo-forms (holographic waveforms) to induce neutron imbalance in a host atom where the host atom then attempts to establish "balance" through the liberation of neutrons. Dratch demonstrated the first model of this novel design back in 1966.

Commercial thorium powerpacks can be developed with 50 or 100 kilowatts of output for home use, and up to 1 megawatt for industrial use. They actually are "power amplifiers" with power outputs of 60 times over input power. Maintenance would be minimal.

IPMS Thorium-227 Electricity Generator

The I.N. Frantsevich Institute for Problems of Materials Science (IPMS), Kiev, Ukraine, from 1951 through 1991 secretly employed 6600 of the most brilliant theoretical physicists in the entire Soviet Union to work for nearly 50 years with complete freedom. They were able to develop whole new sciences, technologies and materials unknown in the West.

Their models of non-linear quantum mechanics, plasma physics, atomic engineering, nuclear physics and related mathematical and theoretical constructs, which made their development possible, are so unique that they challenge the validity of the most fundamental assumptions embodied in the Copenhagen Interpretation model currently held in general acceptance in the West.

For example, Western-developed particle/wave quantum mechanics is described by Einstein's $E = MC^2$. The Soviet nonlinear model of quantum mechanics is described by the formula $E = M_K v$ [Energy = Mass @ rest as a function of a mathematical constant].

Einstein's theory of relativity assumes that the speed of light is constant. However, measurements have shown that the speed of light has slowed down 7 per cent over the past two centuries. (See http://worldnetdaily.com/news/article.asp?ARTICLE ID=39733.) Einstein's famous equation is therefore not based on the real world of peer-reviewed experimental results. Consequently the more correct Soviet model has enabled numerous technical advances not even dreamed of by Western science.

Among several energy inventions developed by the IPMS are free-standing thorium-227 isotope electric power generating plants. They can be small enough to power a single home and large enough to power whole communities. They also can operate for up to 18 years without ever requiring refueling or maintenance.

Micro-Fusion Reactor Employing Stable High-Density Plasma Electron Spiral Toroids In Neutron Tube

Electron Power Systems, Inc., (EPS) has discovered the explanation for ball lightning and from that has invented and protected with five patents an Electron Spiral Toroid Spheromak micro-fusion reactor. Safe, pollution-free micro-fusion reactor-powered generators could reliably generate electricity with capacities ranging from 10 kilowatts through 1000 megawatts at the cost of 10% of today's electricity. All transportation vehicles could be reliably and safely powered with micro-fusion reactors with substantially lower production, operating and maintenance costs and without poisonous emissions. EPS expects to reduce the mass and cost of aircraft by 70%, and space launch costs by more than 95%.

Each year 15 million cars and trucks are sold in the USA, and 48 million are sold worldwide. EPS expects to eventually replace all of them with silent, reliable, safe, emissions-free micro-fusion reactor powered electric vehicles with substantially lower production, operating, and maintenance costs.

In addition, EPS has designed a 10kW generator that will operate on clean, non-polluting fuel, and can operate locally. This innovation will potentially improve the lives of most of humanity by making available low cost electricity that anyone can produce in their own homes. It will help literally billions of people. The paper design shows that the EPS generator will be the approximate

size and cost of a 10 kW generator available today in any hardware store, with the advantage that it will not use fossil fuels, but will use clean energy instead.

An article in the Institute of Electrical and Electronic Engineers, Inc., Spectrum magazine over ten years ago stated that world demand for electricity increases approximately 500 megawatts every day. To put this in perspective, the equivalent of another Hoover Dam would have to be built every four days to keep up with world electricity increase demands. The EPS innovation will make local generation possible without the need for more power plants or more power lines.

Major contributors to air and water pollution are the fossil-fueled engines of aircraft, farm harvesters and tractors, ships, boats, snowmobiles, trains, military vehicles, and all-terrain vehicles. Their engines could be replaced with cheaper electric motors and batteries charged by safe, non-polluting onboard micro-fusion reactor powered generators.

Electron Power Systems, Inc., (EPS) is an early stage company working to develop the Electron Spiral Toroid Spheromak micro-fusion reactor. From EPS will come new applications, including a practical micro-fusion electricity generator, a low-cost space launch vehicle, a high-kinetic energy anti-missile beam, and practical zero-emission cars, trucks, buses, farm equipment, construction equipment, military vehicles, and jet aircraft.

EPS is moving to commercialize these concepts. EPS has assembled a team of engineers, and plasma physicists, all as contractors. EPS is working on proof of concept demonstrations for the applications.

EPS plans to build a laboratory demonstration unit in two to three years with present funding levels, and then the first commercial prototype. Recent breakthroughs in the EPS lab give confidence this will happen within this timeframe. More funding will make this happen sooner.

EPS is seeking $2 million as a first round of investment to complete the development of a demonstration unit in eighteen months. A second investment of $8 million will be needed to complete a prototype unit in eighteen months after the demonstration unit.

Up until now EPS has had no sales and operates with funding from angel investors, each of whom is retired and has accumulated a substantial personal fortune, allowing these types of investments of high risk, high reward. EPS also operates with funding from the founder.

EPS operates on a low budget, spends only what it has, and has incurred no debt or obligations. In this manner it is able to operate indefinitely, while continuing to make progress each year. Additional small amounts of funding will speed developments.

EPS has made a new discovery in physics with the potential to locally produce low-cost, clean energy for homes and buildings, independent of power plants. EPS owns the new technology and plans to initially produce a safe, clean, 10-kilowatt electricity generator that needs no nuclear fuels nor fossil fuels and will produce no green house gases. A home owner would need a one-liter sized container of environmentally benign hydrogen/boron fuel per year at a 20:1 fuel cost savings compared to commercially produced electricity or fossil fuels.

EPS's new discovery would allow anyone worldwide to buy a small home generator, about the size but less than the cost of a Sears 10-kilowatt portable generator. It would power their home plus

several nearby homes even where there are no power grids or power plants. This will be a step towards providing low-cost, local electricity to help eliminate poverty worldwide.

EPS plans to build 10-kilowatt generators by applying its newly discovered technology to improve work done by others to create energy. The basic work was shown successfully in the 1980s at the University of Miami. But that technology had limitations at that time. EPS's new technology will overcome those limitations.

From a modest start with producing 10-kilowatt micro-fusion reactor powered generators, EPS expects to branch out to other applications of its technology as well as producing larger and larger generators.

Mankind's practically insatiable demand for energy implies a simply humongous market potential for EPS which would encompass all of the world's producers of oil, coal, uranium and electricity plus all manufacturers of transportation vehicles including cars, trucks, buses, farm equipment, ships, boats, construction equipment, trains, satellites, aircraft, snowmobiles, and military vehicles.

Several thousand neutron tubes are in use in the USA today that safely collide hydrogen ions to produce neutrons, which in turn are used for medical testing, industrial process control, and homeland security. An ion source produces hydrogen ions (deuterium), which are accelerated to 110 kilovolts, then directed to hit a hydrogen target (also deuterium), which produces neutrons, and also heat as a waste product. Neutron tubes today produce neutrons and a low level of heat energy. The low density of the hydrogen ions limits the amount of energy produced.

In the 1970's, Dr. Wells at the University of Miami collided two plasma toroids to produce low-level fusion energy in the TRISOPS system. The amount of energy produced was limited by the short duration time of the plasma toroids used, as well as their low density and their low level of energy.

Electron Power Systems, Inc., (www.electronpowersystems.com) has discovered a plasma electron spiral toroid that remains stable without magnetic confinement, by using background gas pressure for confinement instead. These new plasma toroids are observed to remain stable for thousands of times longer than classical plasma toroids, which opens the way for new clean energy applications.

EPS's new stable plasma electron spiral toroids overcomes each of the neutron tubes limitations, and will potentially result in fusion with no magnetic containment required – thus producing a practical micro-fusion reactor. EPS's challenge is to adapt the new stable plasma toroid to the TRISOPS method.

The micro-fusion reactor adapts the Electron Spiral Toroid (EST) Spheromak to the neutron tube design. The EST Spheromak is patented jointly with MIT scientists who also have published papers confirming the EST Spheromak physics and data. The EST Spheromak will overcome the neutron tube limitations by increasing ion density by 2500 times. A metal containment can be used for efficient heat energy collection and conversion.

The EST Spheromak micro-fusion reactor will be less than three feet in length, the same as for present neutron tubes, and small enough to fit in an electric car. Elimination of the need for magnetic containment allows this power supply to be small and compact. A micro-fusion reactor will use hydrogen/boron to produce clean energy without neutrons. The energy in one pound of

hydrogen/boron fuel equals the energy of 250,000 pounds of gasoline. Hydrogen and boron are plentiful and will not run out, as oil is projected to do in the 21st century.

The Electron Spiral Toroid Spheromak (ESTS) is a plasma toroid that is self-organized and self-stable with no magnetic fields needed to contain it. Inventor Clint Seward has not seen any published descriptons of any devices nor phenomena similar to the ESTS. The US Patent Office agrees and has issued five patents.

The micro-fusion reactor was recently selected by the New Energy Congress as one of the few technologies now known to have a genuine potential to replace fossil fuels. See the lengthy analysis of the micro-fusion reactor in http://pesn.com/2006/03/08/9600242_Spheromak_Plasma_Toroid/.

"Locomotive Power Sources" for high-speed rail in www.padrak.com/vesperman includes the micro-fusion reactor with BlackLight Power's hydrino generator, focus fusion, Robert Dratch's thorium powerpack, Kiev, Ukraine's I.N. Frantsevich Institute of Problems of Materials Sciences (IPMS) thorium-227 electricity generator, Clem over-unity vegetable oil engine, thin-film electrolytic cells, noble gas plasma engine, Searl effect generator, Magnatron - light-activated cold fusion magnetic motor, Oleg Gritsevich's hydro-magnetic dynamo, IPMS energy storage/battery device, metamatter which is solid crystallized fully-ionized plasma, Gordon Ziegler's electrino fusion power reactor, and environmental heat engines.

Some of these listed new energy inventions appear to have at least one limitation that is not shared with the ESTS micro-fusion reactor.

The Electron Spiral Toroid Spheromak (ESTS) micro-fusion reactor has five patents and is documented in published papers confirming the physics and data. (1), (2), (3), (4)

Clint Seward discovered the ESTS (5) while studying ball lightning. Seward has developed a secret formula to produce the ESTS that is not reported in any other reference to date that he has seen.

Why this is important is that all spheromaks reported to date dissipate in microseconds, while the ESTS has been observed to endure with no confining magnetic field for hundreds of milliseconds, and theoretically will remain stable for many seconds.

1. Seward, C., Chen, C., Ware, K., Ball Lightning Explained as a Stable Plasma Toroid. PPPS-2001 Pulsed Power Plasma Science Conference, June 2001.

2. D. C. Seward, C. Chen, R. Temkin, Energy Storage Device, US Patent 6,140,752, Oct. 31, 2000.

3. C. Chen, R. Pakter, and D.C. Seward, Equilibrium and Stability Properties of Self-Organized Electron Spiral Toroids, Physics of Plasmas. Vol. 8, No. 10. Oct. 2001.

4. W. J. Guss, Chen, C., Equilibrium of Self-Organized Electron Spiral Toroids. Physics of Plasmas. August 2002.

5. Seward, C., Ball Lightning Explanation, Leading to Clean Energy. Acton, MA 01720. Seward Publishing Co., 2011.

EPS plans to initially produce a safe, clean, 10-kilowatt electricity generator that needs no nuclear fuels nor fossil fuels and will produce no green house gases. A home owner would need a one-liter sized container of environmentally benign hydrogen/boron fuel per year at a 20:1 fuel cost savings compared to commercially produced electricity or fossil fuels.

But first EPS needs to obtain $2 million as a first round of investment to complete the development of a demonstration unit in eighteen months. A second investment of $8 million will then be needed to complete a prototype unit in eighteen months after the demonstration unit.

EPS's new discovery would allow anyone worldwide to buy a small home generator, about the size but less than the cost of a Sears 10-kilowatt portable generator. It would power their home plus several nearby homes even where there are no power grids or power plants. This will be a step towards providing low-cost, local electricity to help eliminate poverty worldwide.

From a modest start producing clean, reliable, safe 10-kilowatt micro-fusion reactor powered generators, EPS plans to methodically produce larger and larger generators. EPS even has a preliminary design with supporting calculations for massive 1000-megawatt baseload generators.

Mankind's demand for energy implies an enormous market for micro-fusion reactors encompassing all of the world's producers of oil, coal, uranium and electricity plus all manufacturers of transportation vehicles including cars, trucks, buses, farm equipment, ships, boats, trains, satellites, aircraft, mining equipment, snowmobiles, construction equipment, and military vehicles.

Countries which export oil will benefit from not having to quickly burn up their finite oil reserves on cheap gasoline and diesel fuel. Instead they will be able to draw down their reserves more slowly by making products of higher value such as plastics, medicines, fertilizers and synthetic textiles.

Some years ago a Forbes article stated that PECO (formerly Philadelphia Electric Company), with an income stream to back it up, was able to sell on Wall Street $4 billion worth of bonds paying 5.8 per cent. A micro-fusion reactor powered generator manufacturer could simply sell bonds to build and operate generators at a low interest rate. Generator loan payback times may be in the ball park of a half-year to a year, depending on the local electricity market price. As soon as a micro-fusion powered generator is paid for, the revenue from that time on would be almost pure profit. Once a track record is established by successfully installing a few micro-fusion reactor powered generators, Electron Power Systems, Inc., could raise money to build and install more generators by simply selling billions of dollars of bonds instead of stock. So therefore, there wouldn't be any dilution of ownership.

EPS plans to partner with major electricity producers and suppliers. EPS will license them to produce electricity as they do now. EPS plans to partner with automobile manufacturers to license the technology. EPS plans to partner with defense and aerospace contractors to license the technology.

MANAGEMENT

Clint Seward is the discoverer of the Electron Spiral Toroid Spheromak and received the initial patents. He has been working ever since to scale up the results, which he has been able to do recently. He has been a project design engineer and program manager for many years, working initially with the US Air Force B-58 Hustler program, and as a project manager and engineering

manager in several major corporations. His work was defense initially, moving to security and process control, then energy related.

Clint was an Engineering Manager for Mosler, an American Standard Division 1970 thru 1978, and an Engineering Manager and VP of Marketing for Bristol-Babcock 1978-1985 – an ACCO fortune 500 Company. He was General Manager of Iontrack, a Division of a large international company 1985-1989 (now a Division of GE). He has been President of his own company Electron Power Systems, Inc. from 1989 to present.

Education: MSEE; University of Michigan 1965; BS at US Military Academy at West Point 1963.

D C Seward is the VP Engineering of Electron Power Systems, Inc. He has worked on the micro-fusion reactor technology since its inception in 1986. He has the responsibility for organizing the experiments and bringing qualified people in to help with the work. DC has worked as the VP Engineering of EPS on a contract basis from 1998-Present as funding allows. He is employed full time as a Field Sales engineer for Ember Systems, a wireless technology company, 2005-Present. Previously he was a Product Design Engineer, Trimble Navigation: 1994-1998

Education: MSEE Massachusetts Institute of Technology, 1994.

Jim Becker is acting CEO and Marketing VP. Jim has experience as a senior executive in the high tech sector with extensive experience managing rapid growth organizations. He has a broad technology background with proven skills in computer systems, avionics industries, and health care information technology along with direct functional experience in finance, sales, marketing, engineering and corporate management in both domestic and international settings.

Education: Thayer School of Engineering, Dartmouth College; Master of Engineering 1976; Master of Business Administration 1975; Bachelor of Engineering 1970.

PAPERS AND PATENTS for Clint Seward:

Chen, C., Pakter, R., Seward, D. C. "Equilibrium and Stability Properties of Self-Organized Electron Spiral Toroids." Physics of Plasmas. Vol. 8, No. 10. October 2001.

Seward, C., Chen, C., Ware, K. "Ball Lightning Explained as a Stable Plasma Toroid." PPPS-2001 Pulsed Power Plasma Science Conference. June 2001.

Seward, C. "Propulsion Using a Stable Plasma Thruster." STAIF 2001, (Space Technology and Applications International Forum-2001). American Institute of Physics , www.aip.org/catalog/conforder.html. February 15, 2001.

Seward, C.; Chen, C., Temkin, R. ENERGY STORAGE DEVICE , US Patent 6,140,752, October 31, 2000.

Seward, D. C. Electron Spiral Toroid; US Patent 5,773,919; June 30, 1998.

Seward, D. C. Energy Storage System, US Patent No. 5,589,727. December 31, 1996.

Seward, D. C., Chen, C., Temkin, R. (1996b). International Patent Application WO 96/38848, Energy Storage Device, Published December 5, 1996.

Seward, D. C. Fixed Geometry Plasma and Generator, US Patent 5,175,466. Dec. 29, 1992.

ESP's President Clint Seward collaborated with Gary Vesperman in writing a description of Seward's invention in www.padrak.com/vesperman. See "Locomotive Power Sources".

The Products page of www.electronpowersystems.com sells a book "Ball Lightning: Leading to Clean Energy" and a paper "Spheromaks Observed Forming in Atmosphere". Paper's abstract:

Plasma toroids, called spheromaks, are reported here as observed forming in partial atmosphere from high power electric arc events similar in power to lightning ground strokes. The spheromaks are observed to be stable in partial atmosphere with no confining magnetic fields and are observed to last for more than 200 milliseconds in partial atmosphere. This paper describes the observations and presents a model that explains the properties of these spheromaks, which we call Electron Spiral Toroid Spheromaks (ESTS's) due to the spiraling motion of the charged particles. It includes four TV images. The model presented is a hollow toroid with a thin outer shell of electrons that all travel in parallel paths orthogonal to the toroid circumference, in effect spiraling around the toroid. A comparable inner surface of ions acts to neutralize the space charge. The paper provides formulas describing the ESTS. Potential ESTS applications include X-ray production, air defense, and energy production.

The cost to produce a 10-kilowatt EST Spheromak electricity generator would be about $1100 in production quantities. The EST Spheromak generator would have fewer parts than a comparable Sears generator.

Electron Power Systems, Inc., does not have a working prototype. The company has identified the instrumentation and needs another $100,000 for laboratory work. With $2,000,000, the company expects to have in two years a demonstrable prototype. In an additional year for $8,000,000 a production prototype is expected to be built. Remember, each piece of the project uses technology others have demonstrated.

Clem Over-Unity Vegetable Oil Engine

Richard Clem was a heavy equipment operator who had noticed that a hot asphalt sprayer would continue to run for up to an hour even after the power was turned off! So he built a modified version as a 200-pound engine which ran on vegetable oil at 300 degrees and was started by a 12-volt battery. The heat is internally generated by the engine. During a nine-day test conducted by Bendix Corporation engineers, the engine in its self-running mode consistently generated 350 horsepower into a dynamometer. The engine is constructed from off-the-shelf components except for a hollow shaft and a custom cone with enclosed spiral channels.

If the automobile industry adopts the Clem over-unity engine, motorists could change its eight gallons of vegetable oil only every 150,000 miles and never buy any gasoline. To illustrate the engine's durability, the only working model of the Clem engine has been continually running on his son's farm for several years.

Combining the Clem over-unity engine with the hydrosonic pump could provide distilled ocean water as well as hot water for space heating, kitchens, and bathrooms at *no* energy cost.

The Clem over-unity vegetable-oil engine is not patented. It may be fairly straightforward to set up a small machine shop for manufacturing hollow shafts and cones.

Thin-Film Electrolytic Cells

A number of seasoned technology integrators have developed thin-film energy storage technologies which hold considerable promise. Dr. George Miley, Dr. Robert Hockaday and others have developed thin film technologies with energy densities exceeding 250-400 watt hours per kilogram. Dr. Miley's invention is illustrative. Using a flowing pack-bed type electrolytic cell with 1-molar $LiSO_4$ in light water, 1mm plastic beads with a very thin [500-1,000 angstrom] film of metal [nickel, palladium, titanium] are employed. A special sputtering technique is used to spray the metals onto the surface of the beads. With 2-3 volts of electrical power and 1.5 milliamperes of current, the single film experiments have shown the material to produce more than 10 times as much output power as input. The input power is no more than 0.01 watts while .5 watt of heat is produced.

It is likely that the physics involved in this reaction involve the release of energy as a by-product of nuclear transmutation. Dr. Miley has written, "The key finding from these studies has been the observation of a large array of "new" elements (i.e., different from the original bead coating), many with significant deviations from natural isotopic compositions, after the run.

Great care has been made to ensure that these elements are distinguished from isotopic impurities by use of a "clean cell" with high purity components and electrolytes, in addition to the pre-and post-run analyses. Even low-energy radiation was detected from the bead days after each experiment. Applications to space power, providing a 1-kilowatt cell with only 500 cubic centimeters of active electrode is predicted." Note that this particular invention, with its large over-unity energy yield, was awarded a NERI grant by the DOE. At the insistent urging of the American Physical Society and representatives from MIT and other universities whose laboratories are currently engaged in high-temperature gas-cooled nuclear reactor research, Secretary Richardson eventually withdrew the grant. The tangle-footed Department of Energy actively discourages the development of new sources of energy, presumably to appease the oil, uranium and coal companies. The U.S. Patent Office has unfairly classified secret nearly 5000 energy patents. Luckless energy inventors then risk 20 years in prison if they work on, sell, or publicize their energy invention – often created at great personal sacrifice.

Searl Effect Generator

The Searl effect generator (SEG) can be used to charge the batteries in a self-powered electric vehicle. A solid-state device, the heart of an SEG is a series of three concentric magnetic rings with magnetic rollers going around the rings. Both the rollers and rings are comprised of four layers of titanium, iron, nylon, and neodymium.

The magnetic fields impressed on the rollers have both AC and DC components. The AC component is for floating the rollers so they don't touch the rings. The DC component is to prevent them from flying off. The innermost set contains a minimum of 12 rollers for the same reason that a linear motor will not operate with less than 12 phases.

The inner set of rollers travel around at 250 miles per hour, the middle set travels at approximately 600 miles per hour, and the outer set at approximately 1500 miles per hour. Hundreds of millions of volts are generated the energy of which is picked up by brushes positioned all around the outside set of rollers.

An SEG also creates an anti-gravity field. An uncontrolled SEG will rise about 50 feet as the rollers increase speed, emit a light blue halo which indicates energy is being extracted from the ether, and then shoot up into the sky gaining speed, never to be seen again. At least one roof has been holed by an SEG. The friction-less rollers can be prevented from reaching the critical velocity that produces lift by use of a “governor”, either mechanical or electronic.

An SEG can be easily controlled by immersing it in an electromagnetic wave field the frequency of which is a harmonic of the SEG’s primary frequency. While in resonance, the magnetic poles of the rollers reach a unification state, and they stop moving.

The inventor has built and flown a small “inverse gravity” vehicle. A flying saucer-like SEG-powered aircraft about the size of a bus is currently being built in England by a private group.

The inventor for some years independently powered his house off the power grid with a home-sized electrical generator version of the SEG. A householder could set up a 45 x 45-cm unit and generate an output of 11 kilowatts of free electrical power.

Oddly, a house powered by an SEG has been observed to have greater healing powers than conventionally electric powered houses. The healing effect is claimed to be due to the electrons zapping the occupants, taking away pain and returning blood more quickly to damaged tissue. The SEG would also help combat asthma, bronchitis, hay fever and lung complaints due to the increased supply of oxygen in the body. Conventional methods of electric power do not pump out electrons which results in tired eyes and a tired brain.

The SEG's negative charge also means that dust stays in the carpet instead of floating in the air. This is similar in action to negative ion generators sometimes sold as air fresheners.

Two Russian scientists replicated the Searl effect generator and vindicated all of these somewhat unusual claims. See their paper “Experimental Research of the Magnetic-Gravity Effects”, V. V. Roschin and S. M. Godin, Institute for High Temperatures, Russian Academy of Science, Izhorskaya 13/19, Moscow 127412, Russia.

At one time, a German power company reportedly considered replacing a nuclear power station with eight fuel-less SEGs costing a total of about $4.5 million and generating a total of 240 megawatts with no pollution.

Noble Gas Plasma Engine

Joseph Papp was granted US Patent #3,670,494 for his “Noble Gas Plasma Engine”. A mixture of recycled inert gases (helium, neon, argon, krypton, and xenon) is exposed to a high-voltage discharge in a sealed cylinder with a piston. The spark causes the gases to expand violently though no combustion occurs. Mechanical energy is delivered by the piston's displacement. The gases immediately collapse to their original density, and the cycle is repeated. After several thousand hours the gases lose their elasticity and are replaced. The operating cost is 15 cents an hour.

The first prototype was a simple 90-horsepower Volvo engine with upper end modifications. Attaching the Volvo pistons to pistons fitting the sealed cylinders, the engine worked perfectly with an output of three hundred horsepower. The inventor claimed it would cost about twenty five dollars to charge each cylinder every sixty thousand miles.

There were indications that such an engine could provide its own electrical power and being a closed system, require no fuel. It is not by definition an electromagnetic engine, however. It is believed that at the heart of the Papp engine is the development of high-density electrical charge clusters which provide the energy to expand the gases.

Other patents are 5319336, 4151431, 3670494, 4046167 - Mechanical Accumulator, 3680431 - Method and Means for Generating Explosive Forces, and 4,428,193 - Inert Gas Fuel, Fuel Preparation Apparatus and System for Extracting Useful Work from the Fuel.

Magnatron – Light-Activated Cold Fusion Magnetic Motor

During the late 1970's Howard Rory Johnson, a brilliant inventor in Elgin, Illinois, combined light-activated cold fusion with a new type of magnetic motor into a "Magnatron". His prototype Magnatron produced 525 horsepower but only weighed 475 pounds. It could propel a large truck or bus 100,000 miles on about 17 ounces of deuterium and 1.5 ounces of gallium before being recharged. This was years before either Pons and Fleischman or Dr. James Patterson entered the scene with their cold-fusion technology.

Johnson discovered the light-activated cold fusion portion of the Magnatron by accident when as he was developing a new type of electronic circuit using deuterium oxide and gallium, he noticed the two materials were producing energy on their own. He could not figure out what was triggering the energy production for some time until he finally discovered it was light.

The Magnatron's flow of deuterium (an isotope of hydrogen) is controlled by magnetic tunnels. At the point where the deuterium strikes the gallium (a heavy metal electron donor), a beam of light from a diffraction prism forces their fusion. That controlled reaction results in the fusion of two atoms forming a new atom. In the process, electricity is released, and that is what powers the magnetic motor. The Magnatron is sealed, however, so 'light' is provided from photon energy produced from coils tied directly to the motor. It is more or less a pulse-generated system.

A photon is a football-shaped particle of electromagnetic wave energy. Its energy content is a product of its frequency f and Planck's constant h. When an electron in orbit around the nucleus of an atom drops to a lower, less energetic orbit, a photon containing the energy equivalent to the electron's energy drop is emitted. This explains why light and other forms of electromagnetic energy such as gamma rays and radar are sometimes observed as particles and other times as waves. The heated filament of a light bulb is an example of photon production.
There is no way to explain, using contemporary electrical theory, how his relatively small motor could produce such tremendous horsepower. Utilizing his own new electrical-magnetic energy theory, involving a process he called "attract-attract", Johnson exploited the magnetic field. He used the top and bottom rotors in his motor. First, the top rotor attracted, released; then the bottom rotor attracted, released. The action of attraction, alternating between upper and lower magnets, used the windings to complete the attract field.

Robert Nelson's compilation of articles about the Magnatron provides much more technical detail on the Magnatron than the foregoing. (See http://www.rexresearch.com/magntron/magntron.htm.)

Johnson constructed his prototype Magnatron's 525-horsepower magnetic motor without any of the hardware that is presently used in present state-of-the-art electric motors. Conventional motors use the accepted principle of attract-repel, an energy form that doesn't utilize the magnetic field to its greatest advantage. For comparison, a typical 500-horsepower electric motor has wires exiting it that are the size of a garden hose.

The sealed self-contained Magnatron has no wires. Thus, other than the Magnatron's infrequent refueling with small amounts of deuterium and gallium, the stand-alone Magnatron uses no input power. The Magnatron's entire output power is conveyed by its magnetic motor's rotating shaft.

Fuel for the Magnatron is plentiful: deuterium is derived from water, and gallium is extracted from abundant aluminum bauxite. Commercially available pure gallium is still scarce and expensive. It may well be possible, however, to cheaply transmute another less expensive element into gallium. See Gary Vesperman's list of over two dozen methods of neutralizing radioactive waste in http://freeenergynews.com/Directory/NuclearRemediation/Vesperman/ which includes possible transmutation methods. Additional methods are briefly described in http://freeenergynews.com/Directory/NuclearRemediation/. Dr. Santilli's method plus an explanation of suppression of radioactivity neutralization methods are available at http://www.nuclearwasterecycling.com/. Robert A. Nelson's survey "Transmutations of Nuclear Waste" is at http://www.rexresearch.com/articles/nukewa.htm.

The Magnatron uses no fossil fuel in its operation, and it emits no pollution. The magnetic motor's RPM is 8,000 with a gear ratio of 2:1. Lubrication for the sealed motor is synthetic motor oil which does not need changing and does not need a filter, because foreign materials such as carbon and varnish are not introduced into the system, as they are in the internal combustion piston engine.

This writer, Gary Vesperman, attended the 3rd International Symposium on New Energy in Denver, CO (April 25-28, 1996). I remember being impressed by Gerald Orlowski"s lecture "Magnatron, Fusion Magnetic Motor", during which he provided substantial technical information on the Magnatron.

Orlowski reported that, "Some inside information revealed that OPEC had been keeping track of all competitive technology", and Johnson was #1 on their hit list! Johnson was about to manufacture the motors through a nationwide dealership. Some motors still exist, but the owner wants several million dollars for them."

This writer Gary Vesperman knows of very few inventions of new energy sources which are reasonably large stand-alone energy producers. Besides the Magnatron, they include Oleg Gritskevitch's hydromagnetic dynamo, and Electron Power Systems' micro-fusion reactor, which employs stable high-density plasma electron spiral toroids. Almost all inventions of new energy sources are, or claimed to be, relatively small over-unity power converters that convert input power to greater amounts of output power. Bob Dratch's thorium powerpack is an exception (see above).

At the September 14, 2005 public meeting in Green Valley Ranch casino regarding the proposed Regional Fixed Guideway traversing Las Vegas, Nevada, this writer Gary Vesperman submitted comments suggesting possible power sources for the train, including descriptions of the hydromagnetic dynamo and the micro-fusion reactor (http://www.rtcsouthernnevada.com/rfg/documents/September2005PublicMeetingMinutes.pdf, pp. 19-77).

No wonder the Magnatron's inventor, Rory Johnson, was rumored to have been "Number One" on Organization of Petroleum Exporting Countries (OPEC)'s hit list.

The following is an excerpt, slightly edited, from Orlowski's lecture transcript where he tells about his unwitting personal involvement with the U.S. Government's suppression of the Magnatron:

"After I saw the Magnatron motor, my life changed. I was no longer a happy camper working by myself in a wonderful, fully equipped research machine shop for the Greyhound/Armour Corporation in Arizona. While on a business trip, I saw this motor running in the Magnetron, Inc.'s showroom located in Eglin, Illinois.

"During my 15 years of electric motor repair, among the hundreds of motors I repaired, I rewound a 500 HP electric motor. That motor had wires exiting it that were the size of a garden hose. The Johnson motor being shown had NO wires. Surely this motor was unreal, a con-job to get money for dealerships. Yes, there he was, Rory Johnson standing next to his sealed self-contained electric motor.

"Upon returning to the Greyhound Towers and telling them what I had seen, they instructed me to call Mr. Johnson. Greyhound wanted Johnson to put forth a plan to install a motor in one of their buses for testing purposes.

"I called Johnson. He was delighted that a Greyhound employee had seen the motor running, and replied that the testing idea was acceptable. He would set a time frame for just when a bus should be delivered to him.

"Two years went by, with no business proposal from Johnson. Then, his former business partner, Mike Marzicola, called to say Johnson had passed away. He wanted me to work with him to get one of the motors running. I flew to Orange County, CA, saw the motor, took pictures, and put forth a plan to Greyhound. Subject to a contract with Marzicola, one of the old worn motors would be brought to the research shop. I would then very carefully reconnect the generator wires that Johnson had cut off prior to moving from Elgin, IL to California.

"Discussions with Marzicola brought out that the U.S. Government (given the authority by the Congress of 1952) had issued a GRAB order to take Johnson's motors. Rumor has it, the DOE is run by US oil companies and OPEC, and they want no competition, period. Because of this grab order, Johnson had cut the generator wires. He had then put his `total shop', with motors and all, on several U-Haul trucks and left Illinois in the middle of the night. He went to California to re-establish his business. But before he could get a motor running, he passed away.

"Surely, Greyhound would agree to let me re-start one of Johnson's motors. The wonderful proposal put forth to Greyhound was rejected by mail. Very agitated, I went to the top office at Greyhound demanding an explanation. I was met at the door with the comment, "We know why you are here." Knowing the potential savings to the bus company, surely they could have only one reason for rejecting the proposal. They must have believed I was not qualified to start up the motor.

"Greyhound's top legal advisor stated he was present when the Greyhound board met and discussed my written proposal. He stated the following, "At NO time was the thought put forth that you would not succeed. In fact, we discussed all of the hardware designed and constructed by you, and started the conversation from what happens when Greyhound has a running motor. We contacted a State representative who felt this motor should not be allowed to be used in 4,000+ buses. The loss in tax

dollars for fuel alone would be a very huge sum." He then asked me to leave, stating he was sorry that he had to tell me the reason the plan was rejected.

"Telling Marzicola of the rejection, I offered to personally put in a few thousand dollars toward the parts to get one motor running. In return, I would be assigned the dealership for the Phoenix metropolitan area. We signed legal papers in exchange for the money agreed on, and went to work. (I still have the signed dealership.)

"The first thing I noticed was that someone had been working on repairing the motors. Three motors already had new commutator assemblies installed. Each assembly consisted of 3 commutator assemblies on one insulated tube with a metal case to secure it to the shaft.

"One motor still had the old worn commutator assembly, as it had not yet been repaired."

Orlowski goes on to describe his reconstruction efforts and includes interesting technical details about the Magnatron's structure and theory.

Johnson did not know that OPEC tracks all potential competition to its oil business and that he was reportedly number one on OPEC's hit list. His first mistake was publicizing, in many magazines, his plans to manufacture and distribute his revolutionary motor.

Erik Masen has spoken with a few people who even signed up for distributorships. Erik Masen had included Johnson and his Magnatron in his energy invention suppression anthology (see http://www.electrifyingtimes.com/erik masen suppression.html).

In 1979, Johnson placed his engine in a Buick Electra and was preparing to drive it around the country to sign up more distributorships when the US Department of Energy and the State of Illinois teamed up to prohibit his company Magnatron, Inc., from producing and selling Magnatrons. They first placed a gag order on all the people in the company by using the Secrecy Act of 1952.

Secondly, the State of Illinois immediately requested the company to provide information about all of their employees, distributors, stockholders, investors, suppliers, etc. They asked questions that blatantly deny anyone's constitutional rights to privacy. The pressure from the State of Illinois became so overwhelming that Johnson decided to move his entire business to California in the middle of the night.

After a year of hearing nothing but silence from Johnson, Greyhound agents tried to contact him – only to be notified that he had passed away unexpectedly. This is a particularly troubling part of the story, since he had been in his early fifties and in robust health. Later, Greyhound learned that shortly before he died, Johnson had inexplicably moved out of his laboratory in the middle of the night and taken all of his motors and technology to California.

Bob Bass, in his report copied below on low-energy nuclear transmutation, claims that the CIA, the KGB and the Mossad, etc. all have "sprays" which can be sprayed upon someone and cause him or her to die of apparently natural causes. One speculation is that Johnson's death – apparently due to heart failure – had been artificially induced by such a spray.

In a January 20, 2007 email to Gary Vesperman, Terry Sisson reports:

"Hi Gary,

"I visited Magnatron, Inc., in July 1979. I wish I would have taken a photo. Placards were placed over every inch of the large windows in the front of the building listing all of the questions the State of Illinois requested his company to provide. He wrote, "When has the government ever had the right to ask this of any company." I peeked in the front window and saw one of his motors mounted on an engine stand. Nobody appeared to be there so I walked around to the rear of the building. I found the rear garage door open and could see the Buick Electra inside. I was about to approach nearer when a man emerged. We talked, but he quickly informed me that due to a US gag order he was unable to talk about anything. I managed to get his phone number and called him from time to time for years following. He was an assistant of Rory's and he kept the information very close to the vest. He did tell me that it was real and it worked, yet not how it worked.

"About 1984, I began to call all the Johnsons in the phone book in Elgin. I finally got a hold of Rory's son. He too said that it was real, but I got nowhere. Around 1992, I met Jerry Orlowski, and he told me his experience as the employee of Greyhound who was sent to investigate the technology, since he wound electric motors for several years. Jerry was very upset about the whole incident, particularly Greyhound's Board of Directors refusal to utilize the technology after he found the technology to be authentic. Jerry even witnessed the government's seizure of the motors in California. --- Terry Sisson."

Hydro-Magnetic Dynamo

The hydro-magnetic dynamo is a doughnut-shaped large-scale emission-free electrical generator which does not requires external fueling and operates safely, reliably and silently at moderate temperatures. The dynamo is capable of powering larger transportation vehicles such as buses, trucks, ships, locomotives, and airplanes. Doubt remains about making dynamos compact enough to power automobiles.

The circumstantial evidence for the Russian inventor's performance claims for his hydro-magnetic dynamo is reasonably strong. While three experimental prototypes have been built with Russian and Armenian expertise and equipment, a fourth demonstration prototype needs to be built with more modern Western engineering expertise and equipment to verify dynamo performance claims and to further explore the dynamo's potential capabilities. Performance claims are as follows:

Hydro-magnetic dynamos are scalable from 100 kilowatts to 1,000 megawatts. One doughnut-shaped, fuel-less 1000-megawatt dynamo is about the size of a two-car garage. For comparison, Hoover Dam's 17 generators have a total nameplate capacity of 2,080 megawatts. Seven 1000-megawatt dynamos can be vertically stacked to comprise a single 7000-megawatt dynamo.

A dynamo can reliably run continuously for 25 years or more with little or no maintenance, no external fuel source, and no pollution. If a dynamo's output is 1,000,000 watts, its total input power is approximately 10,000 watts. So the dynamo's energy efficiency is 10,000%, or 100 to 1.

The source of the dynamo's massive electrical output is a nuclear reaction which is not generally known to mainstream science. However, it is known that the dynamo produces alpha particles which are helium nuclei made from fused deuterium, an isotope of hydrogen with one proton and one neutron. The electrons missing from the helium nuclei are what seem to provide a copious "sink" of electricity, and which happen to be the secret to the dynamo's ability to generate an exceptionally large amount of electricity.

It is also known that the dynamo uses high-density charge clusters. High-density charge clusters are the basis of plasma-injected transmutation of elements and also neutralization of radioactive materials.

There were three dynamo prototypes built. The first two small experimental prototypes were built in Vladivostok. The third and last prototype continuously generated electricity, except when turned off to incorporate improvements, from 1992 to January 1997 in Armenia. (It was sadly destroyed during an armed rebellion by local religious fanatics who were unhappy with the Armenian government.) It generated a constant current of 6,800 amperes at 220 volts DC. That multiplies out to nearly 1.5 megawatts. The Armenian prototype dynamo's toroid weighed 900 kilograms and had a diameter of approximately 2 meters.

Cooling water is circulated through copper pipes wrapped around the toroid. The heat is expelled from the cooling water with a heat exchanger.

After a dynamo is assembled in a factory, the water is literally jump-started (by discharging a large bank of capacitors) to moving around the toroid. The dynamo's controls are temporarily set to generating enough of a modest amount of electricity to sustain itself, even while being transported from the factory to its site. For the Armenian prototype dynamo, two 10-farad capacitor banks (from Russian military radar stations) were used to provide the initial water motion (acceleration and excitation of water). Using a total of 20,000 joules, 100,000 volts with 0.05 amperes of current were applied to the Armenian dynamo for 3 - 5 minutes for starting its generation of electricity.

After these Russian radar capacitors were used to jump-start the Armenian prototype dynamo, a bank of buffer batteries sustained continuous operation when water motion and ionizing occurs. This battery bank contained 8 powerful 12-volt, 150-ampere lead batteries. The Armenian dynamo's sustaining input power was 14,400 watts. The nominal maximum output power is nearly 1,500,000 watts. Once, the output current was accidentally increased to 40,000 amperes for almost a minute. Fortunately, the power was reduced to a safe level before the water started to boil. Internal coils (windings) control water velocity and therefore dynamo power.

The dynamo's production cost is estimated at $500 per kilowatt which is competitive to nuclear power’s capital costs of $5,000 per kilowatt, windmill capital costs of $4,000 per kilowatt, etc. A well-run nuclear power plant can generate power for 1.5 cents per kilowatt-hour, coal 1.8 cents, natural gas 3.4 cents, and oil 4.1 cents, on the average. The dynamo’s operating cost would be approximately .1 cent per kilowatt-hour with no external fuel needed nor pollution.

Dynamos could replace all nuclear power plants, solar installations, wood-burning furnaces, hydro-electric dams, windmills, fossil-fueled power plants, etc. Satellites, locomotives, heavy trucks, buses, airplanes, and ships are obvious transportation applications. It does not seem that dynamos can be made compact enough to power electric cars although it certainly would be worth trying.

A Forbes article states that PECO (formerly Philadelphia Electric Company), with an income stream to back it up, was able to sell on Wall Street $4 billion worth of bonds paying 5.8 per cent. A dynamo manufacturer could simply sell bonds to build and operate dynamos at a low interest rate. Dynamo loan payback times may be in the ball park of a half-year to a year, depending on the local electricity market price. As soon as a dynamo is paid for, the revenue from that time on would be almost pure profit.

Once a track record is established by successfully installing a few dynamos, the dynamo company could raise money to build more dynamos by simply selling billions of dollars of bonds instead of stock. So therefore, there wouldn't be any dilution of ownership.

A recent IEEE Spectrum article stated that world demand for electricity increases approximately 500 megawatts every day. To put this in perspective, the equivalent of another Hoover Dam would have to be built every four days to keep up with world electricity increase demands. Or, a dynamo manufacturing company would have to build another 500-megawatt dynamo every single day of the year to keep up with world electricity increase demand in addition to replacing all existing generators fueled by hydro, nuclear, and fossil fuels.

The following is a highly condensed summary of the "Description" of the dynamo's Russian patent IPC H 02 K 44/00 “Method of deriving of electrical energy and organization of Gritskevich’s MHD-generator for its realization”:

The dynamo is a sealed toroid filled with distilled water with heavy water (deuterium oxide) added. Movement of water inside the closed loop and use of unique properties of water as a polar liquid cause a release of electrical energy as an outcome of a rupture of hydrogen connections. Additional electrical energy is drawn from nuclear reactions and micro-cavitational processes. The liquid gets ionized and moving around the toroid at start-up time by a running magnetic field with the help of stimulating electromagnetic windings.

A layer of segnetoelectrical material covers the internal surfaces of the toroid. 32 electrodes made from a hard-alloy material are inserted into the toroid at equal distances apart. These 32 electrodes are connected to a power supply. Additional stimulation windings are also connected to the power supply.

The partially pre-ionized (on the part of the heavy water) water gets ionized further by the high-voltage discharges by the 32 electrodes. With the help of the stimulation windings, a running magnetic field is created which moves the water in one direction inside the toroid. An electromotive force gets created by the electromagnetic induction in a separate set of windings. During the movement of the water stream free electrons get created, and an additional energy gets emitted because of the water’s friction (viscosity) against the layer coated on the inside surface of the toroid, because of electrostatic breakdowns of cavitatal-vacuum structures, and because of the ongoing nuclear reaction. 100 times as much electrical energy is generated as required for electrical energy input.

Note that the hydro-magnetic dynamo is always producing electricity once it is manufactured and jump-started at the factory. Whenever a locomotive is parked in sub-freezing weather, its hydro-magnetic dynamo’s electricity output would be used to heat the dynamo’s containment to prevent its water-filled toroid from freezing.

Whenever a locomotive is parked, its hydro-magnetic dynamo’s excess electrical output could be sold to the local power grid.

IPMS Energy Storage/Battery Device

During the summer of 1984, airborne intelligence surveillance teams of the United States Air Force, operating out of specially configured and equipped Boeing 707 airframes (called AWAC’s) electronically detected (and then shortly thereafter photographed) bursts of coherent light of

enormous power originating in the vicinity of Dushambe, Turkministan. The bursts of light, a brilliant blue-green color, lasted just a few seconds and were shifted almost to the ultraviolet end of the light spectrum. The "laser" beams were directed upwards out of the atmosphere towards American military communications satellites.

At precisely the same time the AWAC's detected and photographed the laser bursts (they were referred to in that jargon by American military analysts but later proved to be something almost entirely different), several of the satellites essential to America's global military command and control communications systems became inexplicably inoperable.

The Defense Intelligence Agency, under the direction of the National Security Council and assisted by the National Security Agency, escalated its surveillance of the remote site in the Ural Mountains from which the bursts first originated. For several months, during a concerted campaign of uninterrupted observation by AWAC's and American spy satellites, no additional bursts were observed or reported. Then, without warning, in the middle of the night nearly seven months later, AWAC's crews operating just outside the territorial airspace of Afghanistan detected similar laser bursts of lower intensity during a period of intensive localized ground warfare.

The Afghanistan bursts were apparently aimed at targets under attack by Soviet infantry units. The laser bursts continued in a sustained, localized but obviously mobile attack pattern, as frequently as four or five times per hour, until nearly sunset of the next day. Photographic evidence gathered at the time by the AWAC's crew, and later corroborated by photographs taken at the actual site of the fire fight and forwarded to the U.S. for analysis, showed that the targets of the laser bursts were ammunition and fuel supply depots located in the remote desert. Several of the ammunition and fuel caches had apparently been destroyed during the attack, as demonstrated by the evidence of explosions, fire, smoke and residual infra-red heat patterns detected, photographed and electronically recorded on-board the AWAC's.

All this information was transmitted (via encrypted communications bursts, routed through the military Global Command Control satellite system) to the National Security Agency (NSA), located at Fort Meade, Maryland. Analysts there recognized that they were looking at evidence of a weapons system which had never been observed before. They did not know what had produced the laser bursts. But they did know that the technology which made such a thing possible was not available to the countries participating in the NATO Convention. They were terrified at the implications of such a development.

Within hours, the information was packaged into classified documents and conveyed to the Joint Chiefs of Staff. The Joint Chiefs examined the information while they were being briefed by the AWAC's crews which had witnessed and recorded the events. After the briefing, the crews were dismantled, and their various members stationed far away from one another, with orders never to discuss the events they had witnessed. Officially, the laser bursts never had occurred.

Secretary of Defense Frank Carlucci took delivery of the packet at his residence in Falls Church, Virginia, three days later, at a private, secret meeting held in the middle of the night. No one has yet adequately explained why the Joint Chiefs waited three full days to brief the Secretary. Early the next morning, he was driven in a specially prepared bulletproof limousine to the White House. He personally delivered the information to the new President of the United States, Ronald Reagan. The content of the Secretary's report had an immediate, measurable impact.

It was this series of events which principally precipitated the Strategic Defense Initiative, a program of military defense and reprisal based on America's state-of-the-art satellite-borne laser-optical and particle accelerator technologies. The S.D.I. system was intended to provide the U.S. with a meaningful deterrent to further aggressive use of the technology developed by the Soviet Military.

There was only one problem with this system, aside from the fact that its astronomical costs almost bankrupted the American economy: it did not work. S.D.I. was designed to respond to a kind of technology which was not achievable in the West, and which could not be explained by any of the models, materials, technologies or sciences known in the West.

In 1985, the top-secret military version of the space shuttle, code named Atlantis, embarked on a special orbital mission. One of its mission assignments was to retrieve, examine or photograph the military spy satellites which had been disabled by the laser bursts recorded in 1979-84. The results of this investigation have not been declassified or released in any but the most censored version to the public. What we do know for certain, as a matter of publicly available non-classified information, however, is that each of the disabled satellites appeared to have had at least one, and in some cases as many as four or five precisely measured holes, approximately the size of an American silver dollar, melted completely through them from the outside.

The photographs taken of the satellites show evidence of intense heat, charring and carbonized residue evenly distributed around the perimeter of each hole. The evidence is clear and unmistakable – the satellites were disabled by a coherent beam of some sort, characterized by such intense energy that it was possible to melt consistently measured holes through the exterior and interior components of American military satellites, after having passed through the atmosphere of the planet and into space for as many as 325 miles. Such a thing has scarcely been dreamed of by the American military, much less put into any but the most nominally effective operational form.

After more than ten years of political, economic and technological wrangling, and after the expenditure of more than one hundred twenty billion dollars in largely ineffectual research and development efforts, it is inescapably clear that no amount of money or political pressure, no amount of geo-political posturing or economic sanctions was going to compel the disclosure or replication of the technologies which produced the results photographed over the Carpathian Mountains and the Afghanistan deserts. The Soviets had developed a weapons system which was so revolutionary that it could not be explained, replicated or defended against.

The Reagan Administration's lack of specificity about the nature of the implied threat to which S.D.I. was supposed to respond subjected the Administration, the Defense Department and the R&D proponents of the most prominent American aerospace corporations to an endless barrage of charges by the Press and the Congress. They were characterized as being disingenuous and accused of being unreasonably secretive during successive appropriations battles in the Congress.

The truth of matter is that the Administration and the Pentagon were not being disingenuous at all. They simply could not admit to the American public that they were attempting to develop an effective response to a weapons system which they did not understand and could not replicate.

There are a number of issues intrinsic to this set of circumstances, along with several dozen others which, though less well known or economically dramatic, are no less important from a technological standpoint. It is certain that the implication of these technologies has not been lost on those multi-national corporations whose entire capital structure may be threatened by the new

sciences, technologies and materials which have been developed in secret laboratories, hidden in caverns excavated beneath the Carpathian Mountains, in the former Soviet Union.

Over the past decade the West has enjoyed occasional gratuitous glimpses into the heart of Soviet science. Attempts to disclose or discuss these developments in the press have been ruthlessly suppressed by powerful special interests vested in both the public and private sectors.

The science which underlies the series of events recounted here remains at the outer limits of the most advanced technology of which the West is capable. The questions posed by the military and corporate analysts about this laser beam weapons system are far-reaching in their scope and implications. Some of them are illustrative:

1) New Model of Quantum Mechanics: The sciences and models of quantum mechanics which produced such stunning recent developments in the West as the laser and maser make quite clear how much energy is required to create a beam of coherent light powerful enough to penetrate the atmosphere, retain its coherence in spite of atmospheric diffraction (and other effects described in quantum mechanics as "thermal blooming"), and melt a two-inch hole clear through a satellite made of the most sophisticated alloys ever produced in the West. Except for limited short-distance demonstrations conducted with industrial grade lasers used in cutting operations, there is no known combination of materials or technologies extant in the West to make such a thing possible.

2) New Materials: The materials necessary to create an electrical charge large enough to power a device capable of producing such a beam certainly do exist. In quantum mechanics the term large enough does not make sense, but we can agree for the purposes of this discussion on the effect of it as represented by such commonly accepted constructs as frequency, voltage, current and ionic flow rates [as distinguished by the phenomenon of resistance].

Hydroelectric plants and large, fixed-base nuclear power plants are capable of producing enough energy to theoretically power such a device. But the energy bursts in both the Carpathians and the Afghan desert were generated by sources which moved from one location to another. In order to do that, several additional considerations must be addressed:

a. Portability: The power source would have to be transportable or be capable of storing sufficient energy to repeatedly power such a device. Western technology cannot produce either a portable power production unit or energy storage system capable of the performance requirements everyone agrees must be met to make the weapons system work, either in the laboratory or in the field. System portability was the most puzzling feature of the NSA/DIA report.

When carefully analyzed, the computer-enhanced enlargements of the photographs taken by the spy satellites and AWAC's crews failed to provide evidence of any tracks which could be attributed to wheeled or tracked vehicles operating in the precise locations and at the same time as the laser bursts which were observed. The implications of this set of circumstances was almost too much to believe – the devices were apparently either hand held or transportable and rechargeable in such a way as to allow them to be transported by one or more foot soldiers, without vehicular support.

b. Enormous Power Requirement: The materials and technologies used to construct a device capable of generating a beam of such enormous power and magnitude would have to be sufficiently advanced to enable the components to be transported without damage over significant distances in unpaved areas of very rough terrain. Such strategies, engineering techniques, construction technologies or materials do not exist in the Western inventory.

c. The continuous repetition of the laser bursts suggests that the devices can be operated repeatedly at short intervals of 12-15 minutes. This means they can be triggered with significantly higher frequency and intensity than anything which can be produced in the West, even for laboratory use. Industrial strength lasers used to cut metals require careful setup, accommodate only limited use in short bursts, require extensive cooling and must be continually recalibrated. These limitations obviously did not apply to the devices being operated in the Afghan desert. Analysts at AMTL agreed that the units would either have to be recharged via an external, independent device or somehow be capable of self-recharging in the field.

Such a thing is almost unthinkable by current Western military standards. Not only can we still not replicate the technology in any meaningful form, but the Soviets had refined the technology to a point which allowed it to be carried on the shoulders of ordinary foot soldiers and recharged in the field without motorized support.

Unbelievable! How was such a thing possible? According to some of the highly qualified scientists who scrutinized the photographs, it is not possible. The "Not Invented Here" syndrome is alive and well in the American engineering community. Some of them still insist that the pictures were either fabricated or demonstrate something completely different than this narrative suggests.

3) Energy Recharge-Batteries: How did such high-intensity laser beam generators get recharged in the middle of the Afghan desert, in the absence of powered support vehicles or fixed-based power plants? There are a number of possible alternatives. They could have been powered by some sort of advanced battery technology. It's possible, but if the battery technology used in the West is used as a model to support such a thesis, it would take a bank of the most sophisticated batteries ever designed by NASA, arrayed in series and parallel configurations larger than five full-sized Soviet T-60 tiger tanks to power such a device.

This theoretical battery bank, operating at 100% efficiency (which is not practically or theoretically possible; the best batteries manufactured in the West operate at less than 60% discharge efficiency), could conceivably produce enough direct current voltage (in a zero resistance super conductive circuit, which is not possible, either) to perhaps produce one burst of light equal in intensity to 20% of the power required to burn a 2-inch hole through a satellite moving at 20,000 miles per hour at a distance of 325 miles.
Soviet ground forces were generating bursts of this magnitude every 12-15 minutes for more than 10 hours with nothing but ground troops. During eight hours of this exchange, it was totally dark. Something pretty remarkable must have been going on to make such a thing possible.

4) Energy Recharge – Solar Cells: Another alternative would have been to have whatever energy storage devices were being used to power the "laser cannons" recharged by sunlight. The state-of-the-art in photo-voltaic cells produced in the West simply would not support such an undertaking. The very best solar cells ever produced in the West have been produced by the Japanese.

These cells operate at a maximum of 19% efficiency - that is, they convert as much as 19% of the ambient visible sunlight shining on a clear, cloudless day into ion flow, which then becomes low voltage direct electrical current flowing through a circuit. The Japanese panels require months per section to manufacture and literally cost more than their weight in gold to manufacture. They are very heavy and are so sensitive to vibration and calibration that once installed, they cannot be moved at all.

Photo-voltaic cells capable of providing enough electricity to recharge a theoretically infinite energy well would have to operate at efficiencies of 50-80% to recharge batteries of infinite electrical capacity with enough power to trigger such a device. Such cells would have to be very light weight and able to withstand extremes of heat, cold, vibration, dust, wind and other conditions encountered in a hostile battlefield environment. Nothing like that exists in the Western technological arsenal.

5) Dielectric Materials – Transformers and Capacitors: Another consideration must be reconciled before this issue can be theoretically put to rest. In order to produce a burst of coherent light of sufficient intensity to have the effect which was observed and recorded by the surveillance teams, the voltage and amperage required to support such a device would have to be staggeringly high. In order to operate at all, the voltage supplied to the system must be released all at once, not in a continuous stream but in a single coherent burst so intense that any materials known in the West would either evaporate or melt. Not only would the best dielectric materials known to Western Science melt because of the heat produced by such enormous energy bursts, but before a bolt of energy of this magnitude could even be released to such a device, it would have to be accumulated and stored somehow.

A similar set of requirements of a less dramatic type is present in all the electronic devices manufactured and marketed in the West. This includes the entire range of electronic devices such as VCR's, computers, televisions and sound components, telecommunications, information storage, transmission and retrieval systems of every kind. We could not live as we do without them. The components which convert, store and release ion flow into the circuitry of these devices are known as transistors, transformers and capacitors.

This discussion delves into a slightly technical area here, so non-scientific types will need to either become familiar with the fundamentals of electricity to understand what is meant or simply give it a possibility that what is developed in the next section is a true representation of the way such things actually operate. The discussion deals with such commonly used and seldom understood concepts as voltage, current, frequencies and resistance.

(a) Transformers convert voltage at one level of current (amperage) to either higher or lower voltage levels. When the voltage is increased, the amperage or current is proportionately decreased. A low voltage produced at a high current level can be transformed into a much higher voltage at a proportionately lower level of current or "power."

(b) Capacitors: The decrease in amperage which accompanies a transformation of low voltage to higher voltage is often compensated for by a device known as a capacitor. In the most simplistic terms, capacitors "store" electrical energy until the amount of voltage and current reach a certain minimal threshold. When that point is reached, the entire store of energy is released all at once in a single burst.

The tantalum materials used in the West to manufacture such devices conform to certain standard rules which are commonly accepted by electrical engineers. These rules have only recently been stretched by new technologies and materials developed in the West. For the purposes of this discussion, though, it is safe to say that electrical engineers have long relied on these rules because they have always produced the same results when applied in the same way. Here's an example.

It is standard engineering fare which dictates that a transformer capable of accommodating one volt at one ampere of current across a grid of one ohm of resistance will be one cubic meter in

dimension. If followed to its logical conclusion, this standard rule of electrical engineering would require that a transformer capable of supporting a laser burst device of the kind operated by the Soviet ground forces in the Afghan desert would have to be approximately the size of a building built on a base 100 feet to a side, nearly 150 feet high.

Surely such a device could not have been hidden from the AWAC's eye in the sky which can clearly photograph the letters on a license plate from 60,000 feet altitude, nor could it have been moved on the shoulders of ground troops without wheeled vehicular support. The fact that there was absolutely no trace of such a huge, massive transformer device (or any other kind of structure or vehicle which could be construed to serve that purpose) means that something else must have been used instead. Military analysts had absolutely no idea what it could have been.

Such a burst system cannot operate without a capacitor of some sort. A capacitive device capable of storing the amount of energy required to power a single burst from a laser cannon, made of the most advanced dielectric material known in the West, would have to have been equally massive and, further, would have to have been cooled by some sort of strategy which would have been instantly and unmistakably detected by the infrared cameras and spectroscopic scanners used aboard the AWAC's and the spy satellites which investigated the scene.

The practical requirements of such a system are best demonstrated by the massive equipment required to operate and cool the Super Conductor Super Collider linear particle accelerators recently designed by the United States and Japan. No evidence of any such capacitive device was recorded in either the Carpathian Mountains or the Afghanistan desert. How can we explain it?

Without going into any detail about how the technologies were developed, suffice it for now to say that the Soviet ground forces in Afghanistan were equipped with a prototype of a hand-held plasma beam accelerator, the likes of which had only been roughly imagined by American military analysts. The device relied on some innovative strategies. Among these were:

Energy Storage Devices: The power source for the Soviet light cannons was comprised of a back-pack array of specially designed energy storage devices. The closest thing we have in our vocabulary to compare to them is described by the term "battery." In the limited sense that these devices store electrical energy, they are batteries. Any other similarity to the batteries we are accustomed to in the West ends there. The literal translation of the Russian name for them is energy accumulators.

The batteries relied on in the West are based on the chemical properties of components which, when combined in certain configurations and proportions, interact chemically with one another. The result of this chemical interaction is that it creates both heat and a stream of liberated ions – electricity. In dry cell batteries, the process of chemical interaction is one way – once they have been expended, they are simply disposed of. It is estimated that more than 12 billion expended dry cell and lead-acid batteries are dumped into America's landfills every year.

Other batteries are designed and constructed so that the chemical reactions which liberate electrical current are reversible in some degree. These rechargeable cells are characterized by the lead-acid batteries which are used in automobiles and in commercial and industrial applications. Various strategies have been developed to make batteries relying on chemical reactions maximally effective, but the theoretical limits of effectiveness of such devices have surely been reached.

A consortium of aerospace companies working with NASA recently announced the development of an advanced sodium-hydride-based rechargeable cell which is the most efficient battery yet invented in the West. Unfortunately, it operates at an ambient temperature of 2000 degrees centigrade and, if allowed to reach temperatures outside a very narrow safe operating zone, will explode with the force of a small thermo-nuclear device of approximately ten-kiloton yield. It is not safe, but it is the best Western science has come up with.

The energy storage device developed by the I.N. Frantsevich Institute for Problems of Materials Science (IPMS), Kiev, Ukraine, works on a completely different principle. Its construction is the result of a completely unique nonlinear quantum mechanical model which makes it possible to create crystalline lattices of absolutely pure carbon (and other materials) in sheets of infinitely variable dimension which are exactly one molecule thick. The crystal formation techniques and the whole body of new science which allows for their creation in the first place are completely unknown to Western science.

The mono-molecular sheets deposited by this technique are wrapped back and forth on top of each other, more than one million times per millimeter, and are separated from each other by a distance of less than one atomic diameter. At this level of construction, the material becomes subject to the rules of quantum mechanics which are almost entirely probabilistic. That means a whole atom of carbon (or almost anything else except an electron or photon) will not fit in the space which separates the lattice sheets.

When viewed under an electron microscope, the sheets produce a pattern which looks for all the world like an endless field of four-sided pyramids, connected base to base, on a single plane, with the tips of the pyramids protruding endlessly, uniformly upwards. When wrapped back and forth on top of each other, these sheets of pure carbon crystal, made of carbon molecules shaped like trillions of identical tiny pyramids, all arrayed endlessly in identical formation, are positioned so that the tips of the pyramids on the bottom sheet are matched with the tips of the pyramids on the top sheets. What remains between the pyramid tips are open “spaces” or energy wells.

The quantum physics which describes the characteristics of the energy wells created between the layers of crystalline lattice is largely unknown to Western physicists. The Soviet model predicts with a high degree of probability that the quanta of energy referred to in the West as electrons (and, in some cases, photons), the stuff of which electricity is made, will, when introduced to the lattice structure, search, find and fit into the energy wells with military precision.

During the recharging or loading phase, the energy storage devices made of the crystalline lattice material channel one electron at a time into each well created by four carbon pyramids on the bottom layer and four carbon pyramids on the top layer. Because the rules of quantum mechanics which operate in this tiny environment demand it, each electron or quanta of energy has a certain polarity, spin and “color” (and other mathematically defined characteristics) which must be accommodated if it is to find, fit and stay in an energy well. Interestingly enough, when a current is applied across the lattice-work structure, the electrons behave precisely as nonlinear quantum mechanics predicts they will. They flow much like a fluid into the lattice field, then separate into individual energy quanta and spin into the last energy well in each layer, automatically adjusting their individual spin, polarity and color to match their characteristics to fit the requirements of each well, until the lattice is full.

Because no chemical reactions are involved in the process of marching electrons into or out of the energy well fields, there is no resistance in the circuit. In the absence of resistance, the electrons fill

the wells at light speed, never missing a space, automatically adjusting polarity, spin and other characteristics, and creating no heat. The amount of time required to "charge" such a cell is less than 5% of the time required to recharge a conventional chemical battery of similar voltage and current.

The validity of $E = MC^2$ is called into question by the way these devices function. When the battery is fully charged, it actually demonstrates more mass than when the energy storage device is empty or discharged. The laws of quantum mechanics relied on in the West state categorically that this is not possible. It is the answer to the question, "How much does a beam of light weigh?"

According to the Soviet model, this is precisely as it should be. When this phenomenon was first demonstrated to scientists in the West who were testing the energy storage devices at INEEL in Idaho, they were thunderstruck. The quanta of energy, or electrons as we refer to them, which are poured into the crystalline lattice demonstrate characteristics of mass even though they are bundles of pure energy sitting in stasis, literally at rest. The characteristic of mass is verifiable – you can measure it by weighing the energy storage devices before and after they are charged. When they are charged, they demonstrate appreciably more mass than when they are fully discharged.

If this is confusing to you, to suggest that pure energy can be shown to demonstrate verifiable mass while at rest (in stasis), perhaps you can begin to appreciate how fundamentally different the physics of all this is when viewed in the terms of Einstein's classic equation $E = MC^2$.

The existence of this technology clearly is proof positive that not only does energy demonstrate the characteristics of mass, but it does so in a state of non-motion or stasis, sitting idly in an energy well. A state of stasis is a very far cry from the terminal theoretical velocity required by the constant in Einstein's equation, equivalent to the square of the speed of light.

The scientific implications of this phenomenon are truly staggering. At very least, the verification of mass as a property of energy quanta at rest suggests that Einstein's theory of relativity may be altogether incorrect as a means of describing the dynamics underlying the real nature of the material world and its relationship to energy.

The existence of this technology suggests at very least, that energy and mass are equivalent characteristics of all things which are manifest in the material world. It is this fundamental contextual difference which distinguishes the Soviet model of quantum mechanics from the Western model. "The proof of the pudding," they say, "is in the eating."

Theoretical physicists may argue endlessly about the validity of the assumptions relied on by the IPMS scientists to develop their unique sciences, technologies and materials. But they cannot argue about the existence of the materials which have arisen from that context. They are as real as they can be. And they are unlike anything ever seen or contemplated in the West.

In the same way energy quanta stored in the energy wells of crystalline lattice materials demonstrate complete mathematical satisfaction with staying there indefinitely, when allowed to flow out in the form of an outgoing wave of electrical discharge, these quanta (electrons or photons, as you prefer) march right back out without resistance at light speed through a closed circuit to another use.

When these energy storage devices are discharged, they demonstrate other attributes which are not known in Western science, and which, because of the very nature of the chemical reactions we are accustomed to, are not theoretically possible according to conventional wisdom. Conventional

chemical batteries, when fully charged, produce electric current at a useable voltage for perhaps 30-40% of the total discharge cycle. After that, either the voltage or amperage (or both) drop to low enough levels that the devices being powered by them cannot recognize or use the electrical current which remains available. At that point, the batteries either have to be recharged or replaced.

The crystal lattice batteries have been demonstrated to produce precisely the same current and voltage levels throughout 98% of their discharge cycle. They produce no heat during discharge, regardless of the rate at which they are discharged. This is absolutely contrary to our experience with batteries, transformers or capacitors. Until the crystalline lattice materials were specifically engineered to register an electronically detectable blip at 95-96% discharge, it was impossible even for the scientists who developed them to distinguish a partially discharged battery from a fully charged one.

There is another characteristic which is intrinsic to energy storage devices which comes into play here. It is a characteristic of materials which is described as energy density. For non-scientific readers, this concept can simply be construed to mean the amount of measurable electrical current which can be produced by any device or material when its mass is converted into electrical energy. The concept is expressed in mathematical formulas as the number of watts and hours of consumable energy which can be converted from each kilogram of material. It is expressed as watt-hours per kilogram.

Here is an example we can all understand. Consider gasoline. When converted into electrical power at 100% efficiency, gasoline has been theoretically shown to have an energy density of between 550 and 600 watt-hours per kilogram of mass. In easy terms, that means that if one kilogram of gasoline were converted into pure electricity at 100% efficiency (with no loss due to heat, resistance, waste, etc.), the reservoir of energy would power a 100-watt light bulb for 5.5 to 6 hours.

Most of the high-end conventional automobile batteries of the lead-acid variety operate at an energy density rate of between 20-25 watt-hours per kilogram. The best NASA sodium-hydride batteries operate at 48-50 watt hours per kilogram. The energy accumulator devices which have been tested at the Idaho National Electronic Laboratories have demonstrated energy densities of between 850 and 1050 watt-hours per kilogram.

What does this mean in practical terms? It means, for one thing, that for the first time in the history of science an energy storage device has been created with an energy density which is greater than gasoline or any other refined fossil fuel. It means that devices which rely on these energy storage technologies can theoretically be designed to store and deliver clean electrical power at higher rates of efficiency than any fossil fuel ever discovered.

The global implications of this technology are irresistible. It means, among other things, that the technology exists, right now, to eliminate the need to build another nuclear power plant or dam another river to produce hydroelectric power. It means we can no longer justify burning another ounce of petroleum, another piece of coal, another cubic centimeter of natural (or unnatural gas) or another tree to produce heat, electricity or power for any purpose, including transportation.

When coupled with the plasma beam devices being tested by the Soviet infantry units in Afghanistan, these energy storage devices operated at such unbelievably high rates of discharge efficiency that they made it possible to repeatedly induce huge electrical discharges in a highly mobile configuration.

The same technologies which were used to produce the energy storage devices have been adapted to create transformers and capacitors with previously unimaginable performance characteristics. Instead of adhering to the conventional western model of "One Volt at One Amp across a resistance of One Ohm equals One Cubic Meter," the Soviets have produced a capacitor which measures more than 1200 farads at 10,000 amperes in a package the size of a tuna sandwich.

When tested by the Technology Materials Testing Laboratory of the Defense Department at the Pentagon and at the I.N.E.E.L. in Idaho, totally new testing equipment had to be designed, engineered and constructed just to test the devices. The scientists at those laboratories had never tested anything like these materials before.

Instead of having to house transformer and capacitor devices in a series of trailers towed by diesel tractors or huge fixed-base facilities, the operating apparatus which supplied transformed power and high intensity capacitive bursts to the light cannons weighed less than ten pounds and could easily be transported in a backpack by a foot soldier.

One final question remains unanswered. "How did the energy storage devices, once dissipated or discharged, become recharged in the field, especially in the dark of night?"

The back-pack plasma beam device detected by the AWAC's during limited combat use in the Afghanistan desert was powered by energy storage devices constructed of crystalline lattice materials. After each laser burst, the energy storage devices were recharged every 12-15 minutes (nearly 45 minutes in the dark of night – the residual ambient heat of the desert is a very efficient source of infrared energy) by sunlight, collected and converted to electricity by four-foot square panels of "solar cell" material arrayed on a pole like a flag, each weighing less than ten ounces.

The electrical energy stored in the back-pack energy accumulators was transformed into enormously high voltages and released at almost unbelievably high current levels when the super-capacitors were sufficiently charged. The beam of "light" detected by the AWAC's crews was a field of plasma, flowing at the speed of light and demonstrating characteristics of mass (and, therefore, kinetic energy). The phenomenon represented by these bolts of lightning are not comprehensible according to the model of quantum mechanics and plasma physics currently being used in the West.

Battery packs utilizing these energy accumulator materials have been designed, produced and tested which provide more than 14 hours of continuously transmitted power on a single charge to conventional hand-held cellular telephone devices. Similar improvements in conventional battery/energy storage capacity have been developed and are being tested for such devices as video camcorders, laptop and portable computers and other similar consumer, commercial, industrial and military applications.

IPMS research in the field of layered crystals has thus led to the creation of capacitors with a very high level of capacitance (measured in farads). This technology is based on a revolutionary production technique which forms polarized surfaces of one molecule thickness, separated by less than one atomic diameter of space, held together by weak Van der Waals energy forces. The special properties created by these layered crystalline structures provide previously unimaginable internal surface areas. Super capacitors are constructed of layered materials numbering more than one million dipole sheets for each millimeter of crystal thickness.

These devices provide a virtually limitless number of charge-discharge cycles at astonishingly rapid charge and discharge rates. The potential impact of such devices on all electronic equipment currently being produced is incalculable, since virtually all electronic devices rely extensively on the West's state-of-the-art tantalum capacitance technologies.

At present, IPMS has on hand (among others) a super-capacitor roughly the size and dimension of a sandwich which develops more than 1,200 farads at 10,000 amperes. It also boasts production of a battery whose active mass energy density exceeds 850 watt-hours per kilogram. For the non-scientist (and all the rest of us as well) this means that a "battery" has been produced which, for the first time in history, produces more power per unit of mass than any fossil fuel ever devised.

Prototype testing of larger-scaled devices designed specifically for providing power to electric vehicles is currently underway. Prototypes are expected to be capable of sustained highway speeds of up to 70 miles per hour with a range of 525 miles on a single charge. The power plant for this application has been recently improved by the inclusion of a proprietary solid-state ceramic electric motor which weighs 7.2 kilograms and produces 100 horsepower on 12-volt direct current. For comparison, an electric vehicle employing a 100-horsepower electric motor performs the same as with a 500-horsepower gasoline engine.

If these performance attainments can be sustained in broad-based applications, electrically powered vehicles could be produced which would meet or exceed virtually all performance characteristics currently available in equipment relying on internal combustion, petroleum-based engines. Gasoline/diesel-powered transportation devices can be replaced by cleaner, more efficient and significantly less expensive alternatives.

The world market for current energy storage applications which will be superseded by these energy storage technologies is estimated to be in excess of $24 billion per year (1991), exclusive of electric vehicle considerations.

Metamatter

9/25/1997 11:16 AM
From: Robert Bass
To: James Bowery<jabowery@netcom.com>;
CC: Robert W. Bass<rbrtbass@pahrump.com>;Gary Vesperman<vman@skylink.net>;
Subject: for the postulated "Bass page"?

Jim,

I just went to http://www.generalstore.com/ and see nothing but "under construction, etc." Is this you, or someone else in another state? Do you know how to (reasonably economically) do Mass-eMailings? Say either from a rented Data Base of known Investors, or just blindly to "millions"?

How about posting the following

Potentially Awesome Speculative Investment Opportunity?
==========
Venture SEED Capital? Low Risk, AWESOME Payback!!!

I seek one or more High-Technology-Oriented "High-Roller" Nerves Investor(s) who would be intrigued by the following proposition (if demonstrably sound and absolutely genuine): Suppose you go to "Super Monte-Carlo" in the sovereign nation of Erehwon, and you come to a table with a Croupier who says:

"I have here a coin the size of a U.S. silver dollar, which is perfectly evenly balanced between Heads and Tails to 10 decimal places [with the edge for Heads in the 11th decimal place]; and a certificate from the US Bureau of Standards certifying it is not "loaded" to favor either Heads or Tails to the best measurements they can make.

"You can flip the coin yourself.

"I have here Certificates of Deposit for $30 Billion in a centuries-old Swiss Bank of spotless reputation.

"My croupier's fee for allowing you to play is ridiculously modest.

"How much are you willing to wager on the honest flip?

"Now suppose the preceding scenario is repeated, except that several of the most reputable scientists in the world assure you that the coin is 'loaded' so that the chances of Heads are between 95% and 99%. Your own experts assure you that you have at worst One Chance in 20 of losing.

"Finally, the croupier says, you may play for $150,000."

To recapitulate, the odds are 20-to-1 that you will win $30 Billion, versus one chance in 20 that your entire $150,000 wager will be lost.

Would you play?

==========
-------PRIVATE Communication-----
------(NOT a Publication)--------
==========

I need Seed Capital of $150,000 under circumstances exactly analagous to those outlined in the Risk/Reward scenario above. If "Heads" comes up, then my patented Plasmasphere technology can be escalated to a Metamatter technology, where by METAMATTER I mean a solid, *crystallized* fully-ionized plasma.

An ordinary crystal has nuclei spaced apart distances of about 10^[-8] cm, the Bohr radius, because the electron cloud makes the atoms behave like little billiard balls of the size indicated.

However, in a plasma, the positively-charge nuclei and the electrons are equal in number, but the electrons are not in orbit around individual nuclei; they are "mixed up" as in a plum-pudding. Most plasma physicists will tell you that in order for hydrogen gas to be fully ionized (i.e., all electrons stripped from all nuclei) the temperature of the gas would have to be above 150,000 degrees Kelvin (i.e., 15 times hotter than the surface of the Sun). But this is demonstrably FALSE (both theoretically and experimentally).

If the gas is dense enough, it can be fully ionized at "low" temperatures, e.g. 5000 Kelvins [so-called "pressure ionization"].

Now suppose that the fully ionized low-temperature gas is condensed into the physical state of a liquid metal. I call this a Liquid Metallic Plasmoid (LMP). The characteristic of an LMP is that, like mercury, it keeps a constant volume; unlike a gas, it does not expand to fill all available space (if in a vacuum). The positive nuclei remain on average equidistant, and the electrons circulate around the dynamic lattice as in a giant crystalline molecule. Cook called it a "Cryscapade"; whereas others might call it a Liquid Crystal.

Fewer than a score people in the world understand that LMPs can exist. One LMP was photographed in half a dozen or so photos on the cover of the Journal of Applied Physics in 1957 by [later] Nitro-Nobel Medalist, physical chemist, Dr. Melvin Cook. The theory by which Cook explained his accidental discovery has been *independently* rediscovered (in 3 separate countries, USA, UK & France) by researchers seeking to explain the illusive natural phenomenon of Ball Lighting.

The late expert on High-Energy Lasers and Shock Tubes, Dr. Jay Blauer of Rockwell Rocketdyne, who died early of leukemia, helped me to design an experiment that would prove beyond shadow of a doubt that LMPs can be created at will. The basic idea is to use a combination of Shock Tube technology and High-Energy Laser technology, with my patented Plasmasphere technology, in order to achieve in a non-self-destructive, reusable device, what Cook discovered accidentally with high-explosives in a self-destructive experiment.

Once the mere EXISTENCE of producible-at-will LMPs is achieved (for the Risk Capital of $150K), it will be trivially easy to raise several million more for refinement of the device to move the LMP into a cryogenic vacuum chamber where (since it is electrically conductive) it can be magnetically levitated and allowed to cool by radiation.

Use of the Brush-Sahlin-Teller Equation of State (used to design the H-bomb) shows that as the LMP cools, its volume contracts, and it becomes more and more dense. There can be shown to scientists sufficiently expert to understand the evidence, a mass of recent experimental evidence (as well as expert theoretical evidence) that before the LMP gets down to room temperature it will crystallize into a Metastable Solid Crystal, namely a *new form of matter* never seen before on Earth!!!

The density will be intermediate between that of ordinary condensed matter and that of neutron stars, wherein a teaspoonful weighs tons.

I propose to manufacture 3 kinds of Micro-Crystals of Metamatter: MSP, MSD, and MSD. Each addresses in a truly *revolutionary* way a trillion-dollar market, with a multi-billion dollar profit potential. In many ways, Metamatter will have a bigger impact on human civilization than any prior discovery, including both computers and atomic energy! In fact, consider the following:

MSP (Meta-Stable Protium [hydrogen]) will be the IDEAL room-temperature Superconductor, which will revolutionized both the Computer/Electronics industry and the Electric Power industry.

MSD (Meta-Stable Deuterium [heavy-hydrogen]) will be the ideal 5th Generation Cold Fusion fuel; when triggered by an infra-red photon of 17.7 eV, a micro-pellet will undergo a phonon-mediated and Lattice-Catalyzed ANEUTRONIC chain-fusion reaction to cleanly release the energy of 10

sticks of dynamite, to make steam for mechanical heat and conversion at 67% efficiency into electrical energy. This can make both homes and automobiles independent of the present electrical utility companies, though they will still need to buy the almost dirt-cheap MSD fuel micro-pellets from Metamatter Industries.

MSH (Meta-Stable Helium) will be the IDEAL rocket propellant for expanding human civilization into the Solar System (e.g. to colonize Mars); when a micro-crystal of MSH is triggered by the right frequency of laser-light, it will return to the form of gas as if it had been compressed by tens of millions of atmospheres of pressure; it will release 43 times more energy per unit weight than any conceivable chemical combination!

During the mid 1980s, the Air Force Systems Command sent a group of 7 or 8 Colonels who held Doctorates in the physical or engineering sciences to scour the USA for 9 months, in groups of 2 or 3, and to report back on what futuristic technology would have the greatest potential impact on the USAF and USA economy by the year 2000 if reduced to actual practice. They listened to 600 industrial and academic presentations and selected MSH as the greatest payoff (for least risk) choice! The USAF Rocket Propulsion Lab was supposed to issue 8 parallel contracts for 8 "crash" projects to see if bulk MSH could be manufactured. I was slated to get one of the 8 contracts, but my approach (through solidifying a helium LMP) was radically different from that of the other 7 selected proposers.

With MSH as fuel, one could take a 50 percent payload to Mars and back in two weeks! (Accelerate there and return at one gee.)

But a Princeton professor of Physics, Will Happer, then Secretary of the JASONS [advisers to DOD/DOE], advanced theoretical arguments which appeared to shoot down the practicality of the other 7 approaches, and the whole project was canceled. But Happer's arguments are totally irrelevant to my approach. Moreover, Happer was later Chief Scientific Advisor to Admiral Watkins (Secretary of DOE) when the ERAB Report was produced.

Those who understand the recent work of Arata and Zhang in which the aneutronic conversion of deuterium nuclei to helium nuclei inside of a palladium lattice is recorded in Real Time (inside of a sealed apparatus which contains a Mass-Spectrometer and which give ZERO helium when the heavy-water deuterium is replaced by ordinary-water hydrogen) know that Aneutronic Cold Fusion (CF) is a demonstrable FACT and that Happer and the ERAB Report were WRONG. Therefore it is logical to consider the possibility that Happer was also wrong when, before he shot down CF, he also shot down MSH.

There is ZERO risk in producing an LMP; it is just that 99.999% of all scientists are ignorant of Cook's work.

There is a slight technical risk in crystallizing an LMP at room-temperature; conceivably, it will remain liquid until below the temperature of liquid nitrogen, in which case my proposal will have been a failure. But the payoff is so AWESOME, and the chances of failure so tiny, that the risk seems worth taking.

I can supply drawings of the Proof-of-Principle Process Prototype Plasmasphere demonstration designed by Dr. Blauer and myself. Jay Blauer told me that he could do the experiment in his spare time evenings and weekends "in two weeks" using shock-tube and laser equipment already in his lab at Rocketdyne, provided he had $10,000 cash for items and materials not on hand.

Several "reputable" labs have explained to me that they would not even consider bidding on doing the Bass-Blauer experiment for less than $100,000. I have personal contacts at 22 government and private labs (such as JPL, SRI, LANL, etc.) which I would like to visit with my former graduate student Dr. Lou Puls (who, unlike me, is an accomplished experimental plasma physicist) to make joint presentations on the theoretical and experimental aspects of creation of an LMP, preparatory to asking them to bid. After 22 weeks spent in such visits, (and paying Dr. Puls Consulting Fees) I expect to have $50,000 left to offer the Highest Bidder. I also expect that no one will bid less than $100,000. But I also expect that out of the 22 presentations, at least several will become so excited that they will offer to Cost Share. In several labs, the working-level scientists interested in LMPs have told me, "If you can get the Management to pay attention, we have in place already a mechanism and a precedent to Cost Share."

Remembering what happened to Fleischmann and Pons it will accomplish naught for me to take the $150K, rent the equipment, and do it in my own garage. Nobody will believe it, and nobody will pay any attention. However, if we spend 6 months getting suitable technical personnel of nationally reputable laboratories excited about the subject of LMPs, and then some lab with the prestige of, say, JPL or LANL or SRI, announces the production of an LMP, many other labs will immediately undertake to "catch up" and to replicate the result at their own expense. Once 3 or 4 labs have announced successful replication, no one will doubt and then it will be trivially easy to raise the venture capital to go from LMPs to solid, crystallized Metamatter micro-crystals of MSP, MSD, and MSH.

I can supply a large amount of written technical material to anyone who is interested in raising the $150,000 seed capital required to get Metamatter Industries off the ground (and for me to file the pioneering Patent Applications, and since I am now licensed to practice Intellectual Property Law before the PTO I can do it myself at no extra expense – as did the physicist/patent-attorney who invented the Xerox process).

This will be BETTER than getting in on the ground floor of Xerox or Polaroid or Microsoft!

Sincerely,

Robert W. Bass, M.A. Oxon, Ph.D.
Dr. Robert W. Bass, Registered Patent Agent 29,130 [ex-Prof Physics]
Inventor: Topolotron, Plasmasphere, issued; QRT Cold Fusion, pending
P.O.Box 1238, Pahrump, NV 89041-1238; phone/FAX (702) 751-0932/0739
Voice-Mail: (702) 387-7213 e-Mail: rbrtbass@pahrump.com

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XXX.YYY
XXX Venture Partners

Dear XXX,
Have you got your _____ Fund off the ground yet? Did you receive the Proposal I sent you last week?

Do you agree that the logic of the Analogy I used for the proposed Low-Risk, AWESOME Payoff, "Proof-of-Principle" (POP) Experiment is sound? If a rational Investor were convinced (e.g. by the photos published by Nitro-Nobel Medalist, Melvin Cook) that it is possible to put a plasma in the state of liquid metal (Liquid Metallic Plasmoids, or LMPs), and that the ONLY risk is that when cooled to room temperature they will not yet crystallize [but won't crystallize until down below, e.g.. the temperature of liquid nitrogen], which risk will be taken by OPM [Other People's Money] when the scientific community realizes that LMPs can be created at will, and that there is ZERO risk in performing the proof-of-principle demonstration experiment to convince them of this fact, and that this can be done for as little as $150,000 (which will also permit Patent Applications ensuring the inside track when LMPs get crystallized), don't you agree that the Reward to Risk Ratio of $3 X 10^[10]/$1.5 X 10^[5] = 2 X 10^[5] multiplied by the probability of crystallization at room temperature (which is supported by hundreds of theoretical papers on MSH and at least one recent paper in Physical Review Lettersw on MSP, as much, much better than 50%), namely an EXPECTED REWARD/RISK RATIO of more than 100,000-to-1 implies that this Proposal is "better" than any proposal made in this field yet, when you note that each of the 3 main products to be manufactured from crystallized LMPs, namely MSP, MSD, and MSH, EACH separately addresses a different Trillion-Dollar Market with a clear Profit Potential of more than $10 Billion?

Moreover, this is a Proposal in which the Investor who RISKS $150K will know within a mere 6 or 7 months WHETHER OR NOT Phase One of his speculation has paid off! (And it is highly likely that the Absolute Answer will be known within another 3 months, considering how fast the scientific community reacts to something, e.g. High-Temperature Superconductors, which is both surprising and EASY to replicate!)

Please tell me when a Speculative Investment Possibility better than this one has last crossed your desk? (I'll bet, NEVER!)

Regards,

Bob Bass

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Electrino Fusion Power Reactor

Gordon L. Ziegler has discovered how to make a clean electrino fusion power reactor capable of generating up to a net of 1880 megawatts of DC electricity. The proposed energy source would produce no carbon emissions and no radioactive wastes. (By reversing the order-to-disorder arrow in the second law of thermodynamics, a $50,000,000 electrino fusion power reactor could be built which would also reverse all aging, disease, and decay processes within a one-mile radius.)

Power output, however, cannot occur in this system without the simultaneous operation of two aspects of the invention. One is an accelerator-collider making a field reversing the order-to-disorder arrow in the second law of thermodynamics in a controlled area. Among other things, that field makes the other aspect of the system (the power source) efficient enough to be self-sustaining and prevents the formation of radioactive wastes.

Electrons are generally regarded to be structure-less spinning point charges. But that contradicts a reasonable postulate that occurred to Gordon L. Ziegler in 1967: “A spherically or cylindrically symmetric smooth charge distribution cannot have detectable spin.” Electrons have detectable spins. Therefore they must not have smooth structure-less symmetric charge distributions. They must be lumpy and have internal structure. An application of the Parsimony Principle shows that they must be composed of two half-charges orbiting each other at the speed of light. The reason scientists concluded that the electron was structure-less was that it could not be blasted apart in collisions up to 700 MeV each particle.

But in Ziegler’s model, electron sub-particles are bound together by confinement by a speed of light barrier (they are trapped going faster than the speed of light). They cannot be blasted apart, even though they are two particles.

The two sub-particles of electrons make a whole different structure for matter than quarks and leptons. The sub-particles can also fuse with each other – making new particles. Fusing sub-particles of positrons reverses the order-to-disorder arrow in the second law of thermodynamics – making the power source efficient enough to be self-sustaining and preventing the radioactive wastes from forming. Fusing the sub-particles of electrons comprise the power source.

Key components include a polarized positron source, injector accelerators, inflection magnets, end magnets, and the beam transport.

Governments and utilities would buy electrino fusion power reactors because the process is a clean, inexpensive way to produce electricity. It is 1000 times as efficient as nuclear reactors. It does not require uranium or plutonium for fuel. It can run on anything for fuel such as dirt, sand, sewage, ground garbage, toxic chemicals, radioactive wastes, sea water, etc. without carbon nor radioactive pollutants.

Assume that the collision energy were 940 MeV to avoid unwanted heat (operate at room temperature), and the current in each beam was 1.0 ampere of electrons. The energy investment into the electrino fusion would be 1880 megawatts. The energy released in annihilation photons would be 3760 megawatts. Recoverable net power would be 1880 megawatts or less.

The collision energy of the linear accelerator would be 940 Mev (each particle – 1880 MeV in the center of mass frame). The current in each beam would be 1.0 amperes of electrons. There would be two beams 180 degrees from each other.

The energy released in annihilation photons would be 3760 megawatts. "Annihilation photons" are the 940 MeV X-Rays produced when a negatron annihilates a proton. These X-rays are converted to electricity by order-to-disorder arrow reversed photo-voltaic cells with nearly 100% efficiency.

In summary the 3760 megawatts output of annihilation photons would be converted to electricity. However, in order to keep the electrino fusion reaction going, 1880 megawatts would be taken from the 3760 megawatts to power the linear accelerator. The net energy output would thus be 1880 megawatts-electric.

The size of an electrino fusion reactor would be about 80 ' x 10' x 10'. The fuel is whatever brass or copper James M. Potter uses in constructing the walls of his linear accelerators. James M. Potter, Ph.D., is President, JP Accelerator Works, Inc., 2245 47th Street, Los Alamos, NM 87544, 505-690-8701 or 888-301-2833 or 505-661-8155, jpotter@jpaw.com, http://www.jpaw.com. 155 lbs of

brass would be consumed over 100 years before shutdown for refueling. The linear accelerator would be a standard commercially available model. It would not need to be customized for an electrino fusion reactor.

The smallest electrino fusion reactor that would be possible to build is now about 80' x 10' x 10'. It may eventually be the size of a filing cabinet.

The projected cost of the first 1880-megawatt electrino fusion reactor is approximately $100 million. This clean source of electricity could be built in two years, and the necessary Refresher built in one year. Electricity could be generated for only about 1.5 percent of current rates (a little over 0.1 cent per kwh). Subsequent clean energy sources can be built for $37.5 million each.

The 1880 megawatts (net) of electricity generated by an electrino fusion power reactor would be Direct Current (DC). A utility would need thick wires and the biggest busbars and transformers on the planet. Conversion from DC to Alternating Current (AC) would require the world's largest inverters.

The electrino fusion reactor requires the Refresher to be self-sustaining. But the Refresher has several positive medical side effects due to reversing the order-to-disorder arrow that cannot be eliminated – in a controlled area reverse adult aging and wipe out diseases.

Refresher 1
Design Specifications

Size of accelerator	20 meters long by 3 meters wide
Diameter of channels	4 cm (maybe a little more to allow for water cooling channels)
Type of accelerator	Folded linear accelerator with pulsed klystron RF power supplies and S-band cavities (2856 MHz)
RF power supplies	Eight 35 to 50-megawatt pulsed klystrons
duty factor	0.1% (peak current 1000 times average current)
Average power	400 kW (20 kW per meter of accelerator)
klystron efficiency	~50%
total system power	800 kW
cooling water requirement for each 5 m section	5 to 10 gpm

cooling water required by each klystron	~ 5 gpm
cooling towers capacity	800 kW

Cost:

Linear accelerator	$12 million
Klystrons	$ 8 million
Klystron power supplies and cooling towers	$ 2 million
Magnets and their power supplies	$ 2 million
System with controls	$ 8 million
10% contingency	$ 3.2 million
Builder's cost	$35.2 million
Other budgeted items	$14.8 million
Total budgeted	$50 million

Creation time total	3 years
Design time (beam dynamics, rf power systems, cooling, and computer control)	1 year
Fabrication and subassembly testing	18 months
Installation and commissioning	6 months

(The following chapter is taken from *Formulating the Universe*, Volume II, by Gordon Ziegler, Chapter 7. Copyrighted by Benevolent Enterprises 2004. Used with permission.)

Chapter 7

SECOND LAW OF THERMODYNAMICS

A. Introduction

Everything goes from a state of order to more disorder. Brand new automobiles wear out and rust. Objects break or are damaged. A thermos bottle falls off the counter, and the inner glass bottle is shattered. We do not expect the shattered bottle to fall back up to the counter and become whole again. There is a one-way arrow for the events to transpire. That arrow is the Second Law of Thermodynamics.

Houses grow old and fall into decay. Barns fall down. Fruit spoils, people and animals grow old and die. Viruses mutate. People become ill and die. Crime and disorder in society increase. Homes break up. Aborted fetuses disintegrate. Dead people and things decompose. All of these negative occurrences are the outworking of the second law of thermodynamics – that part of which is an arrow making everything go from order to disorder.

Let us consider what other people have written about the second law of thermodynamics.

"Second law of thermodynamics

"An equilibrium macrostate of a system can be characterized by a quantity S (called *entropy*) which has the following properties:

"(i) In any infinitesimal quasi-static process in which the system absorbs heat dQ, its entropy changes by an amount

$$dS = \frac{dQ}{T} \qquad (7\text{-}1)$$

where T is a parameter characteristic of the macrostate of the system and is called its *absolute temperature*.

"(ii) In any process in which a thermally isolated system changes from one macrostate to another, its entropy tends to increase, i.e.,

$$\Delta S \geq 0. \qquad (7\text{-}2)$$

"The relation (7-1) is important because it allows one to determine entropy *differences* by measurements of absorbed heat and because it serves to characterize the absolute temperature T of a system. The relation (7-2) is significant because it specifies the direction in which nonequilibrium situations tend to proceed."[1]

The above expression of the second law of thermodynamics is regarding entropy and heat. Other writers include the order-to-disorder arrow in the second law of thermodynamics.

"It is a matter of common experience that disorder will tend to increase if things are left to themselves. (One has only to stop making repairs around the house to see that!) One can create order out of disorder (for example, one can paint the house), but that requires expenditure of effort or energy and so decreases the amount of ordered energy available.

"A precise statement of this idea is known as the second law of thermodynamics. It states that the entropy of an isolated system always increases, and that when two systems are joined together, the entropy of the combined system is greater than the sum of the entropies of the individual systems. For example, consider a system of gas molecules in a box. The higher the temperature of the gas, the faster the molecules move, and so the more frequently and harder they collide with the walls of the box and the greater the outward pressure they exert on the walls. Suppose that initially the molecules are all confined to the left-hand side of the box by a partition. If the partition is then removed, the molecules will tend to spread out and occupy both halves of the box. At some later time they could, by chance, all be in the right half or back in the left half, but it is overwhelmingly more probable that there will be roughly equal numbers in the two halves. Such a state is less ordered, or more disordered, than the original state in which all the molecules were in one half. One therefore says that the entropy of the gas has gone up. Similarly, suppose one starts with two boxes, one containing oxygen molecules and the other containing nitrogen molecules. If one joins the boxes together and removes the intervening wall, the oxygen and nitrogen molecules will start to mix. At a later time the most probable state would be a fairly uniform mixture of oxygen and nitrogen molecules throughout the two boxes. This state would be less ordered, and hence have more entropy, than the initial state of two separate boxes."[2]

"The explanation that is usually given as to why we don't see broken cups gathering themselves together off the floor and jumping back onto the table is that it is forbidden by the second law of thermodynamics. This says that in any closed system disorder, or entropy, always increases with

time. In other words, it is a form of Murphy's law: Things always tend to go wrong! An intact cup on the table is a state of high order, but a broken cup on the floor is a disordered state. One can go readily from the cup on the table in the past to the broken cup on the floor in the future, but not the other way round.

"The increase of disorder or entropy with time is one example of what is called an arrow of time, something that distinguishes the past from the future, giving a direction to time."[3]

B. Electrino Model and 2nd Law

The natural tendency of leptons in beta decay is that the parent lepton combines with one or more gravitons to produce more particles. In all natural reactions, the order energy of the resultant particles is less than or equal to the order energy of the original particles.

1. Negative Energies. Let us consider antimatter more carefully. "In the Dirac theory also, *the permissible energy values for a free particle range from $+mc^2$ to + 4 and from $-mc^2$ to - 4.* The first of these results is of course just what we expect for a free particle – that its total energy can have any value greater than its rest energy. But the second result is quite puzzling, since it implies the existence of states of *negative total energy.*"[4] Anderson in 1932 discovered positrons in cosmic radiation. These were regarded as Dirac's negative energy particles. "The first two solutions of the Dirac equation . . . clearly describe a free electron of energy E and momentum **p**. The two negative energy electron solutions . . . are to be associated with the antiparticle, the positron."[5]

However, in the annihilation it is not $(+mc^2) + (-mc^2) = 0$, but $2mc^2$ is the result of annihilation.[6] There is something strange going on with the minus signs in these equations. The calculations are inconsistent.

Maybe there are two kinds of energy considered. One we can call entropy energy E_S. In the annihilation reaction, $\#+mc^2\# + \#-mc^2\# = 2mc^2$. Entropy energy is the higher value. The other energy is order energy E_O. In order energy the same reaction is $(+mc^2) + (-mc^2) = 0$.

Let us consider entropy energy and order energy for particle decay schemes. There are a few decay schemes where no negative order energy (anti-matter) is introduced in the right hand side of the decay schemes. In those few instances, the final order energy is equal to the initial order energy (when kinetic energy is taken into account). But in most cases, a trace of negative order energy (anti-matter) is introduced into the right side of the decay schemes. There is nothing on the left hand sides of the decay schemes to correspond to this addition of a trace of negative order energy on the right sides of the decay schemes. Therefore, total order energy is less on the right hand sides of the decay schemes than on the left hand sides (if only by a trace). A few decay schemes introduce a lot of antimatter (as K^-) on the right side of the decay scheme. The loss of order energy in the systems is greater in those cases. But in every case, for all natural processes, the order energy final is # the order energy initial, or

$$\Delta E_0 \leq 0. \qquad (7\text{-}3)$$

Let us check the order energy for electron electrino fusion reactions. Electrons made energetic by acceleration (as heavy as protons) fuse and form anti-protons. Matter is converted to anti-matter. Entropy energy is conserved, but not so order energy. Order energy is reduced in the extreme from +938 MeV to -938 MeV or more for each electron fused (two electrons are fused in each reaction).

The order-to-disorder arrow for electron electrino fusion points in the usual direction. The system does obey the second law of thermodynamics.

2. Reversing the Order-to-Disorder Arrow. What would happen if we fused the electrino constituents of positrons instead of the electrino constituents of electrons? Entropy energy E_S would again be conserved. Entropy would be increased. However, order energy E_O would go from -2 x 938 MeV to +2 x 938 MeV – from disorder to order. The order-to-disorder arrow would be reversed. This would be a reaction that would be prohibited by the second law of thermodynamics – unless the strong gravitational force that fuses the anti-semions would be stronger than the second law of thermodynamics (which otherwise governs weak interactions). The stronger of the strong gravitational force and the second law of thermodynamics should be determined by experiment. More rides on that one experiment than perhaps on any one other experiment in this generation. If it is found that strong gravity is stronger than the second law of thermodynamics, then order can be restored at first in a small area, and then for the whole earth.

Here we see that the entropy arrow of time and the order-to-disorder arrow of time are separate and distinct, and are not one and the same thing. While all the reactions the author has studied increase entropy, the fusion of positron anti-semions reverses the order-to-disorder arrow, making more order out of the disorder.

Positron constituent electrino fusion might not only take the electrinos from disorder to order. It could make other physical processes in a local area go from disorder to order. The positron fusion not only violates the second law of thermodynamics, it reverses the order-to-disorder arrow of that law in a local area, making other processes in that area reverse. Let us consider that process more to see how it might be regulated.

We guess the desired relationships for reversing the order-to-disorder arrow in the second law of thermodynamics through dimensional analysis. We want to solve for r, the maximum radius in which the reversed law would be effective. There is a way we can obtain a length from combinations of our variables and constants. That way is in the right hand side of Eq. (7-4). The whole expression is the thermodynamic relation we are seeking. The thermodynamic relation is:

$$(\Delta E_o)_t > 0 \ \textit{where} \ r < \frac{(\Delta E_o)_1 \ c}{ik}, \qquad (7\text{-}4)$$

where E_o is the order energy – the positive or negative energy in the pair production of particles; ΔE_o is the change in the order energy, where $(\Delta E_o)_t$ is the change in the total order energy of the system, and where $(\Delta E_o)_1$ is the change in the order energy for a single source reaction – for a positron fusion reaction it is approximately 2 x 10^9 eV/collision x 1.6 x 10^{-19} joules/eV = 3.2 x 10^{-10} joules/collision; c is the speed of light – approximately 3.0 x 10^8 m/s; we shall solve for the effected radius r; i is the beam current in each beam in Coulombs per second (we will solve for 10^{-11}); k is the ratio of particle energy to particle charge. This energy per charge is the accelerated energy of the particle (roughly 1 x 10^9 ev times 1.6 x 10^{-19} joules/ev = 1.6 x 10^{-10} joules) divided by the charge of each positron (q = 1.6 x 10^{-19} coulombs), which equals 10^9 joules per coulomb. The collision efficiency eff is not needed in this equation, because the result is not in particles, but is already in collisions.

Incredibly, the lower the current, the bigger is the radius of the affected area. The greater the current, the smaller is the radius of the effected area. With 10^{-11} A beam currents, the effected

radius r solves for 9.6 meters – roughly 10 meters, which describes a small area – less than a tenth of an acre.

To get an idea of the positron beam currents needed to reverse the order-to-disorder arrow of the second law of thermodynamics in what size of affected radius, see Table 7-1 below.

For an area the size of	r	beam current
House	10 m	10 pA
four football fields	100 m	1 pA
community	1 km	100 fA
city	10 km	10 fA
Israel	160 km	0.6 fA
U.S.	2,400 km	0.04 fA
World	13,000 km	0.008 fA
Sun	1.7E11 m	6E-22 A

Table 7-1. Beam currents versus affected radius for reversal of the order-to-disorder arrow of the second law of thermodynamics.

We must make sure that reversing the second law will do only good and not evil before we flip the switch. Inspired evidences will be studied in the next chapter on a wide range of phenomena affected by reversing the order-to-disorder arrow in the second law of thermodynamics.

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[1]F. Reif, *Statistical Physics*, Berkeley Physics Course--Volume 5 (New York: McGraw-Hill Book Company, 1967), p. 283.

[2]Stephen Hawking, *A Brief History of Time*--From the Big Bang to Black Holes (New York: Bantam Books, 1988), pp. 102, 103.

[3]*Ibid.*, pp. 144, 145.

[4]Robert B. Leighton, *Principles of Modern Physics* (New York: McGraw-Hill Book Company, Inc, 1959), p. 665.

[5]Francis Halzen, Alan D. Martin, *Quarks and Leptons* (New York: John Wiley & Sons, 1984), p. 107.

[6]David S. Saxon, *Elementary Quantum Mechanics* (San Francisco: Holden-Day, 1968), p. 386.

(End of Chapter 7)

EXECUTIVE SUMMARY OF BUSINESS PLAN

electrino energy is a new company formed to develop the inventions envisioned by the new model of physics—the electrino fusion model of elementary particles. Our company provides theoretical work and guidance to licensees. Our focus is the reverser of aging, disease, and decay processes (Refresher 1) and whatever else we must do to fund the Refresher 1.

electrino energy was formed October 12, 2005 as an invention development and theorist service specializing in four high-technology inventions – inertia-less craft; artificial gravities; reverser of aging, disease, and decay processes; and electrino fusion reactors generating electricity. All four inventions have potentially extremely high value. But all four inventions currently have three principle difficulties: 1) they are unbelievable by almost all persons – including agency heads, venture capitalists, congressmen and senators; 2) almost all of them cost scores of millions of dollars to develop; and 3) **electrino energy** has no money to develop them. With no capital and no revenue stream or other assets to fall back on, **electrino energy** cannot even get a guaranteed loan.

But **electrino energy** is not resource-less and in a hopeless condition. It has three principal approaches that it can take to resolve this dilemma:

1) Though the aging reverser is the most urgently needed, a miniature inertia-less craft can be constructed for a whole lot less money. It should be possible to construct one for a few hundred dollars borrowed from friends. But that technology could be licensed for hundreds of millions of dollars – enough to finance all the four high-tech inventions.

2) As a back-up to that approach, venture capital angels could be approached to advance the money to finance the reverser of aging, disease, and decay processes. This invention is not only high tech, but medical. The other inventions could be developed at a later time.

3) As a back-up to that approach, the owner could pursue his particle theory, predicting the masses of particles. That may be difficult, but not impossible. This would do what no other physical theory can do. Such a feat would be publishable, arousing interest among scientists for creating a facility to test the model – opening the way for government funding of the high-tech inventions.

A master decision tree flow chart linking and employing these three alternatives for funding the development of the inventions is in Section 7.0 Financial Plan.

According to alternative 1), projected sales and profits for the first four years of operation are summarized below:

Year	Sales($)	Profits($)	Profit/Sales(%)
1	200,000,000	0	0
2	0	0	0
3	0	0	0
4	10,000,000,000	9,000,000,000	90.0

According to alternative 2), there are no actual projected sales and profits for the first three years of operation. Year four is the same as above. According to alternative 3), there are no projected sales or profits for the first five years.

Currently, there are no competitors for any of these inventions. Once public incredulity is overcome by demonstration, the devices should have huge market potential.

The size of the electricity generating market is essentially enormous. It would be up to 50 percent of electric generation world-wide eventually. That's probably over a trillion dollars.

A self-powered high-speed locomotive powered by an electrino fusion power reactor would need to be at least 85 feet long.

Environmental Heat Engines

Las Vegas inventor Robert Stewart developed his "Stewart Cycle" engine for transportation vehicles, electricity generators, and large-scale water lifters. His efficient and pollution-free engine uses ambient heat to expand a working fluid such as Freon or ammonia and move pistons through sealed chambers. His patent is for Vapor Actuated Power Generating Device, No. 4,033,136.

A possibly more up-to-date version is Ralph J. Lagow's Method of Generating Power from a Vapor, Patent No. 4,693,087. Ken Rauen's Rauen cycle and Superclassical cycle engines also expand working fluids with environmental heat to provide useful net mechanical power.

Mr. Stewart claimed that his fuel-less engine could lift Colorado River water from below Hoover Dam back up into Lake Mead, thereby doubling Hoover Dam's output of electricity. He also proposed lifting water from the Columbia River into the Colorado River via a canal, generating electricity as the water flowed back downhill.

Thank you for your comment, Brian Swope.

The comment tracking number that has been assigned to your comment is SEDDsupp20016.

Comment Date: December 1, 2011 22:49:57PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20016

First Name: Brian
Middle Initial: M
Last Name: Swope
Organization:
Address: 175 Bluxome Street
Address 2: Unit 311
Address 3:
City: San Francisco
State: CA
Zip: 94107
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

The Mojave Desert should not be given to energy companies to use as they please. This is public property that should be preserved for future generations to enjoy. Wide-open spaces and desert vistas are irreplaceable and will disappear forever because of this short-sighted decision.
Solar facilities should be located on disturbed land and rooftops, not pristine habitat.
Do not give my desert to these corporations!

Thank you for your comment, Gary Vesperman.

The comment tracking number that has been assigned to your comment is SEDDsupp20017.

Comment Date: December 2, 2011 00:39:43AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20017

First Name: Gary
Middle Initial:
Last Name: Vesperman
Organization:
Address: 588 Lake Huron Lane
Address 2:
Address 3:
City: Boulder City
State: NV
Zip: 890051018
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Locomotive_Power_Sources.docx

Comment Submitted:

Attached is my compilation of candidate power sources for high-speed rail locomotives. It is available in my website www.padrak.com/vesperman. Page 10 has this on the Searl effect generator:

Searl Effect Generator

The Searl effect generator (SEG) can be used to charge the batteries in a self-powered electric vehicle. A solid-state device, the heart of an SEG is a series of three concentric magnetic rings with magnetic rollers going around the rings. Both the rollers and rings are comprised of four layers of titanium, iron, nylon, and neodymium.

The magnetic fields impressed on the rollers have both AC and DC components. The AC component is for floating the rollers so they don't touch the rings. The DC component is to prevent them from flying off. The innermost set contains a minimum of 12 rollers for the same reason that a linear motor will not operate with less than 12 phases.

The inner set of rollers travel around at 250 miles per hour, the middle set travels at approximately 600 miles per hour, and the outer set at approximately 1500 miles per hour. Hundreds of millions of volts are generated the energy of which is picked up by brushes positioned all around the outside set of rollers.

An SEG also creates an anti-gravity field. An uncontrolled SEG will rise about 50 feet as the rollers increase speed, emit a light blue halo which indicates energy is being extracted from the ether, and then shoot up into the sky gaining speed, never to be seen again. At least one roof has been holed by an SEG. The friction-less rollers can be prevented from reaching the critical velocity that produces lift by use of a "governor", either mechanical or electronic.

An SEG can be easily controlled by immersing it in an electromagnetic wave field the frequency of which is a harmonic of the SEG's primary frequency. While in resonance, the magnetic poles of the rollers reach a unification state, and they stop moving.

The inventor has built and flown a small "inverse gravity" vehicle. A flying saucer-like SEG-powered aircraft about the size of a bus is currently being built in England by a private group.

The inventor for some years independently powered his house off the power grid with a home-sized electrical generator version of the SEG. A householder could set up a 45 x 45-cm unit and generate an output of 11 kilowatts of free electrical power.

Oddly, a house powered by an SEG has been observed to have greater healing powers than conventionally electric powered houses. The healing effect is claimed to be due to the electrons zapping the occupants, taking away pain and returning blood more quickly to damaged tissue. The SEG would also help combat asthma, bronchitis, hay fever and lung complaints due to the increased supply of oxygen in the body. Conventional methods of electric power do not pump out electrons which results in tired eyes and a tired brain.

The SEG's negative charge also means that dust stays in the carpet instead of floating in the air. This is similar in action to negative ion generators sometimes sold as air fresheners.

Two Russian scientists replicated the Searl effect generator and vindicated all of these somewhat unusual claims. See their paper "Experimental Research of the Magnetic-Gravity Effects",
V. V. Roschin and S. M. Godin, Institute for High Temperatures, Russian Academy of Science, Izhorskaya 13/19, Moscow 127412, Russia. See http://rexresearch.com/roschin/roschin.htm#xpresmgfx.

At one time, a German power company reportedly considered replacing a nuclear power station with eight fuel-less SEGs costing a total of about $4.5 million and generating a total of 240 megawatts with no pollution.

(End of excerpt)

For more information on the Searl effect generator, see rexresearch.com/tomion/tomion.htm,
rexresearch.com/roschin/roschin.htm#xpinv,
rexresearch.com/roschin2/roschgod.htm,
rexresearch.com/roschin/roschin.htm#xpinv,
rexresearch.com/roschin/rg1.htm,
rexresearch.com/roschin/roschin.htm#usp,
rexresearch.com/searl/searl.htm,
rexresearch.com/searl/searl2.htm,
rexresearch.com/searl2/searl3.htm,
rexresearch.com/searl3/searl.htm, and
rexresearch.com/searl4/searl4.htm.

This Draft Solar PEIS should thoroughly and honestly compare the cost-effectiveness of a World War II Manhattan Project-styled crash program to quickly develop and commercialize the Searl effect generator with the cost-effectiveness of covering and ruining millions of acres of pristine wildlands with relatively inefficient and expensive solar energy collectors and transmission lines.

Locomotive Power Sources

High-speed trains typically rely on some means of supplying energy to the locomotive from an external source. For example, cumbersome overhead electric lines are tapped to directly power a locomotive's electric drive wheels. Another method of connecting the locomotive to an electricity grid is with a dangerously exposed high-voltage third electrified rail. Linear magnetic propulsion mechanisms have been researched.

It would be much cheaper and easier to build and operate high-speed trains if their locomotives utilize an internal practically fuel-less power source.

The following candidate high-speed locomotive power sources appear worthy of further research. Some may be found to be worthwhile for building and testing prototype self-powered locomotives.

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BlackLight Power's Hydrino Generator

BlackLight Power, Inc., is developing an exotic new source of clean energy from ordinary water. Either an electrolytic cell or gaseous potassium ions in a vacuum compress hydrogen atoms into lower-energy-state hydrogen atoms called "hydrinos". When the hydrinos are formed, energy is released which in magnitude is between chemical and nuclear energy. BlackLight Power, Inc., has ambitious plans for retrofitting fossil-fueled and nuclear power plants.

BlackLight Power, Inc., is developing a 100-kilowatt generator which can power a car 100,000 miles on a tank of water. BlackLight Power, Inc., claimed some years ago that it is developing a 10-kilogram battery which can supply 150 horsepower for 1,000 miles.

BlackLight Power, Inc., has already licensed 8,250 megawatts of clean, safe hydrino generation fueled by water to seven utilities (Hoover Dam's nameplate capacity is 2,080 megawatts) – eliminating $2 billion/year in fuel costs.

Focus Fusion

See http://www.focusfusion.org/. Apparently this method is much less expensive than hot fusion.

Thorium PowerPack

Bob Dratch's thorium powerpack would generate electricity at approximately one-tenth of the cost of current methods of producing electricity. Thorium is sufficiently abundant that the entire planet can be powered for millennia. After ten years of continuous operation, a trace amount of U-233 is produced. U-233 recovery to re-purify the thorium is easily accomplished. Thorium thus lasts a long time when recycled and consequently is a very efficient energy source. After extraction from ore, thorium does not require energy-intensive enrichment as is the case with uranium.

A thorium-powered reactor is inherently safe. It doesn't run the risk of "meltdown" or explosion nor can even a dirty bomb be created. Its nuclear reaction simply stops when its neutron exciter is turned off.

The simplest and smallest "table top-sized " neutron exciter design is something close to the size of a 4-D cell flashlight, and starts at about 500-kilovolt neutron output. In fact this smallest most cost-effective system can run off 4 D cells for its power.

A thorium powerpack's neutron excitor does not use radioactive flux components as conventionally done for portable systems. Instead it relies on Dratch's invention of a novel method of resonant phonon pair cleavage using specifically designed nuclear lattice holo-forms (holographic waveforms) to induce neutron imbalance in a host atom where the host atom then attempts to establish "balance" through the liberation of neutrons. Dratch demonstrated the first model of this novel design back in 1966.

Commercial thorium powerpacks can be developed with 50 or 100 kilowatts of output for home use, and up to 1 megawatt for industrial use. They actually are "power amplifiers" with power outputs of 60 times over input power. Maintenance would be minimal.

IPMS Thorium-227 Electricity Generator

The I.N. Frantsevich Institute for Problems of Materials Science (IPMS), Kiev, Ukraine, from 1951 through 1991 secretly employed 6600 of the most brilliant theoretical physicists in the entire Soviet Union to work for nearly 50 years with complete freedom. They were able to develop whole new sciences, technologies and materials unknown in the West.

Their models of non-linear quantum mechanics, plasma physics, atomic engineering, nuclear physics and related mathematical and theoretical constructs, which made their development possible, are so unique that they challenge the validity of the most fundamental assumptions embodied in the Copenhagen Interpretation model currently held in general acceptance in the West.

For example, Western-developed particle/wave quantum mechanics is described by Einstein's $E = MC^2$. The Soviet nonlinear model of quantum mechanics is described by the formula $E = M_K v$ [Energy = Mass @ rest as a function of a mathematical constant].

Einstein's theory of relativity assumes that the speed of light is constant. However, measurements have shown that the speed of light has slowed down 7 per cent over the past two centuries. (See http://worldnetdaily.com/news/article.asp?ARTICLE ID=39733.) Einstein's famous equation is therefore not based on the real world of peer-reviewed experimental results. Consequently the more correct Soviet model has enabled numerous technical advances not even dreamed of by Western science.

Among several energy inventions developed by the IPMS are free-standing thorium-227 isotope electric power generating plants. They can be small enough to power a single home and large enough to power whole communities. They also can operate for up to 18 years without ever requiring refueling or maintenance.

Micro-Fusion Reactor Employing Stable High-Density Plasma Electron Spiral Toroids In Neutron Tube

Electron Power Systems, Inc., (EPS) has discovered the explanation for ball lightning and from that has invented and protected with five patents an Electron Spiral Toroid Spheromak micro-fusion reactor. Safe, pollution-free micro-fusion reactor-powered generators could reliably generate electricity with capacities ranging from 10 kilowatts through 1000 megawatts at the cost of 10% of today's electricity. All transportation vehicles could be reliably and safely powered with micro-fusion reactors with substantially lower production, operating and maintenance costs and without poisonous emissions. EPS expects to reduce the mass and cost of aircraft by 70%, and space launch costs by more than 95%.

Each year 15 million cars and trucks are sold in the USA, and 48 million are sold worldwide. EPS expects to eventually replace all of them with silent, reliable, safe, emissions-free micro-fusion reactor powered electric vehicles with substantially lower production, operating, and maintenance costs.

In addition, EPS has designed a 10kW generator that will operate on clean, non-polluting fuel, and can operate locally. This innovation will potentially improve the lives of most of humanity by making available low cost electricity that anyone can produce in their own homes. It will help literally billions of people. The paper design shows that the EPS generator will be the approximate

size and cost of a 10 kW generator available today in any hardware store, with the advantage that it will not use fossil fuels, but will use clean energy instead.

An article in the Institute of Electrical and Electronic Engineers, Inc., Spectrum magazine over ten years ago stated that world demand for electricity increases approximately 500 megawatts every day. To put this in perspective, the equivalent of another Hoover Dam would have to be built every four days to keep up with world electricity increase demands. The EPS innovation will make local generation possible without the need for more power plants or more power lines.

Major contributors to air and water pollution are the fossil-fueled engines of aircraft, farm harvesters and tractors, ships, boats, snowmobiles, trains, military vehicles, and all-terrain vehicles. Their engines could be replaced with cheaper electric motors and batteries charged by safe, non-polluting onboard micro-fusion reactor powered generators.

Electron Power Systems, Inc., (EPS) is an early stage company working to develop the Electron Spiral Toroid Spheromak micro-fusion reactor. From EPS will come new applications, including a practical micro-fusion electricity generator, a low-cost space launch vehicle, a high-kinetic energy anti-missile beam, and practical zero-emission cars, trucks, buses, farm equipment, construction equipment, military vehicles, and jet aircraft.

EPS is moving to commercialize these concepts. EPS has assembled a team of engineers, and plasma physicists, all as contractors. EPS is working on proof of concept demonstrations for the applications.

EPS plans to build a laboratory demonstration unit in two to three years with present funding levels, and then the first commercial prototype. Recent breakthroughs in the EPS lab give confidence this will happen within this timeframe. More funding will make this happen sooner.

EPS is seeking $2 million as a first round of investment to complete the development of a demonstration unit in eighteen months. A second investment of $8 million will be needed to complete a prototype unit in eighteen months after the demonstration unit.

Up until now EPS has had no sales and operates with funding from angel investors, each of whom is retired and has accumulated a substantial personal fortune, allowing these types of investments of high risk, high reward. EPS also operates with funding from the founder.

EPS operates on a low budget, spends only what it has, and has incurred no debt or obligations. In this manner it is able to operate indefinitely, while continuing to make progress each year. Additional small amounts of funding will speed developments.

EPS has made a new discovery in physics with the potential to locally produce low-cost, clean energy for homes and buildings, independent of power plants. EPS owns the new technology and plans to initially produce a safe, clean, 10-kilowatt electricity generator that needs no nuclear fuels nor fossil fuels and will produce no green house gases. A home owner would need a one-liter sized container of environmentally benign hydrogen/boron fuel per year at a 20:1 fuel cost savings compared to commercially produced electricity or fossil fuels.

EPS's new discovery would allow anyone worldwide to buy a small home generator, about the size but less than the cost of a Sears 10-kilowatt portable generator. It would power their home plus

several nearby homes even where there are no power grids or power plants. This will be a step towards providing low-cost, local electricity to help eliminate poverty worldwide.

EPS plans to build 10-kilowatt generators by applying its newly discovered technology to improve work done by others to create energy. The basic work was shown successfully in the 1980s at the University of Miami. But that technology had limitations at that time. EPS's new technology will overcome those limitations.

From a modest start with producing 10-kilowatt micro-fusion reactor powered generators, EPS expects to branch out to other applications of its technology as well as producing larger and larger generators.

Mankind's practically insatiable demand for energy implies a simply humongous market potential for EPS which would encompass all of the world's producers of oil, coal, uranium and electricity plus all manufacturers of transportation vehicles including cars, trucks, buses, farm equipment, ships, boats, construction equipment, trains, satellites, aircraft, snowmobiles, and military vehicles.

Several thousand neutron tubes are in use in the USA today that safely collide hydrogen ions to produce neutrons, which in turn are used for medical testing, industrial process control, and homeland security. An ion source produces hydrogen ions (deuterium), which are accelerated to 110 kilovolts, then directed to hit a hydrogen target (also deuterium), which produces neutrons, and also heat as a waste product. Neutron tubes today produce neutrons and a low level of heat energy. The low density of the hydrogen ions limits the amount of energy produced.

In the 1970's, Dr. Wells at the University of Miami collided two plasma toroids to produce low-level fusion energy in the TRISOPS system. The amount of energy produced was limited by the short duration time of the plasma toroids used, as well as their low density and their low level of energy.

Electron Power Systems, Inc., (www.electronpowersystems.com) has discovered a plasma electron spiral toroid that remains stable without magnetic confinement, by using background gas pressure for confinement instead. These new plasma toroids are observed to remain stable for thousands of times longer than classical plasma toroids, which opens the way for new clean energy applications.

EPS's new stable plasma electron spiral toroids overcomes each of the neutron tubes limitations, and will potentially result in fusion with no magnetic containment required – thus producing a practical micro-fusion reactor. EPS's challenge is to adapt the new stable plasma toroid to the TRISOPS method.

The micro-fusion reactor adapts the Electron Spiral Toroid (EST) Spheromak to the neutron tube design. The EST Spheromak is patented jointly with MIT scientists who also have published papers confirming the EST Spheromak physics and data. The EST Spheromak will overcome the neutron tube limitations by increasing ion density by 2500 times. A metal containment can be used for efficient heat energy collection and conversion.

The EST Spheromak micro-fusion reactor will be less than three feet in length, the same as for present neutron tubes, and small enough to fit in an electric car. Elimination of the need for magnetic containment allows this power supply to be small and compact. A micro-fusion reactor will use hydrogen/boron to produce clean energy without neutrons. The energy in one pound of

hydrogen/boron fuel equals the energy of 250,000 pounds of gasoline. Hydrogen and boron are plentiful and will not run out, as oil is projected to do in the 21st century.

The Electron Spiral Toroid Spheromak (ESTS) is a plasma toroid that is self-organized and self-stable with no magnetic fields needed to contain it. Inventor Clint Seward has not seen any published descriptons of any devices nor phenomena similar to the ESTS. The US Patent Office agrees and has issued five patents.

The micro-fusion reactor was recently selected by the New Energy Congress as one of the few technologies now known to have a genuine potential to replace fossil fuels. See the lengthy analysis of the micro-fusion reactor in http://pesn.com/2006/03/08/9600242_Spheromak_Plasma_Toroid/.

"Locomotive Power Sources" for high-speed rail in www.padrak.com/vesperman includes the micro-fusion reactor with BlackLight Power's hydrino generator, focus fusion, Robert Dratch's thorium powerpack, Kiev, Ukraine's I.N. Frantsevich Institute of Problems of Materials Sciences (IPMS) thorium-227 electricity generator, Clem over-unity vegetable oil engine, thin-film electrolytic cells, noble gas plasma engine, Searl effect generator, Magnatron - light-activated cold fusion magnetic motor, Oleg Gritsevich's hydro-magnetic dynamo, IPMS energy storage/battery device, metamatter which is solid crystallized fully-ionized plasma, Gordon Ziegler's electrino fusion power reactor, and environmental heat engines.

Some of these listed new energy inventions appear to have at least one limitation that is not shared with the ESTS micro-fusion reactor.

The Electron Spiral Toroid Spheromak (ESTS) micro-fusion reactor has five patents and is documented in published papers confirming the physics and data. (1), (2), (3), (4)

Clint Seward discovered the ESTS (5) while studying ball lightning. Seward has developed a secret formula to produce the ESTS that is not reported in any other reference to date that he has seen.

Why this is important is that all spheromaks reported to date dissipate in microseconds, while the ESTS has been observed to endure with no confining magnetic field for hundreds of milliseconds, and theoretically will remain stable for many seconds.

1. Seward, C., Chen, C., Ware, K., Ball Lightning Explained as a Stable Plasma Toroid. PPPS-2001 Pulsed Power Plasma Science Conference, June 2001.

2. D. C. Seward, C. Chen, R. Temkin, Energy Storage Device, US Patent 6,140,752, Oct. 31, 2000.

3. C. Chen, R. Pakter, and D.C. Seward, Equilibrium and Stability Properties of Self-Organized Electron Spiral Toroids, Physics of Plasmas. Vol. 8, No. 10. Oct. 2001.

4. W. J. Guss, Chen, C., Equilibrium of Self-Organized Electron Spiral Toroids. Physics of Plasmas. August 2002.

5. Seward, C., Ball Lightning Explanation, Leading to Clean Energy. Acton, MA 01720. Seward Publishing Co., 2011.

EPS plans to initially produce a safe, clean, 10-kilowatt electricity generator that needs no nuclear fuels nor fossil fuels and will produce no green house gases. A home owner would need a one-liter sized container of environmentally benign hydrogen/boron fuel per year at a 20:1 fuel cost savings compared to commercially produced electricity or fossil fuels.

But first EPS needs to obtain $2 million as a first round of investment to complete the development of a demonstration unit in eighteen months. A second investment of $8 million will then be needed to complete a prototype unit in eighteen months after the demonstration unit.

EPS's new discovery would allow anyone worldwide to buy a small home generator, about the size but less than the cost of a Sears 10-kilowatt portable generator. It would power their home plus several nearby homes even where there are no power grids or power plants. This will be a step towards providing low-cost, local electricity to help eliminate poverty worldwide.

From a modest start producing clean, reliable, safe 10-kilowatt micro-fusion reactor powered generators, EPS plans to methodically produce larger and larger generators. EPS even has a preliminary design with supporting calculations for massive 1000-megawatt baseload generators.

Mankind's demand for energy implies an enormous market for micro-fusion reactors encompassing all of the world's producers of oil, coal, uranium and electricity plus all manufacturers of transportation vehicles including cars, trucks, buses, farm equipment, ships, boats, trains, satellites, aircraft, mining equipment, snowmobiles, construction equipment, and military vehicles.

Countries which export oil will benefit from not having to quickly burn up their finite oil reserves on cheap gasoline and diesel fuel. Instead they will be able to draw down their reserves more slowly by making products of higher value such as plastics, medicines, fertilizers and synthetic textiles.

Some years ago a Forbes article stated that PECO (formerly Philadelphia Electric Company), with an income stream to back it up, was able to sell on Wall Street $4 billion worth of bonds paying 5.8 per cent. A micro-fusion reactor powered generator manufacturer could simply sell bonds to build and operate generators at a low interest rate. Generator loan payback times may be in the ball park of a half-year to a year, depending on the local electricity market price. As soon as a micro-fusion powered generator is paid for, the revenue from that time on would be almost pure profit. Once a track record is established by successfully installing a few micro-fusion reactor powered generators, Electron Power Systems, Inc., could raise money to build and install more generators by simply selling billions of dollars of bonds instead of stock. So therefore, there wouldn't be any dilution of ownership.

EPS plans to partner with major electricity producers and suppliers. EPS will license them to produce electricity as they do now. EPS plans to partner with automobile manufacturers to license the technology. EPS plans to partner with defense and aerospace contractors to license the technology.

MANAGEMENT

Clint Seward is the discoverer of the Electron Spiral Toroid Spheromak and received the initial patents. He has been working ever since to scale up the results, which he has been able to do recently. He has been a project design engineer and program manager for many years, working initially with the US Air Force B-58 Hustler program, and as a project manager and engineering

manager in several major corporations. His work was defense initially, moving to security and process control, then energy related.

Clint was an Engineering Manager for Mosler, an American Standard Division 1970 thru 1978, and an Engineering Manager and VP of Marketing for Bristol-Babcock 1978-1985 – an ACCO fortune 500 Company. He was General Manager of Iontrack, a Division of a large international company 1985-1989 (now a Division of GE). He has been President of his own company Electron Power Systems, Inc. from 1989 to present.

Education: MSEE; University of Michigan 1965; BS at US Military Academy at West Point 1963.

D C Seward is the VP Engineering of Electron Power Systems, Inc. He has worked on the micro-fusion reactor technology since its inception in 1986. He has the responsibility for organizing the experiments and bringing qualified people in to help with the work. DC has worked as the VP Engineering of EPS on a contract basis from 1998-Present as funding allows. He is employed full time as a Field Sales engineer for Ember Systems, a wireless technology company, 2005-Present. Previously he was a Product Design Engineer, Trimble Navigation: 1994-1998

Education: MSEE Massachusetts Institute of Technology, 1994.

Jim Becker is acting CEO and Marketing VP. Jim has experience as a senior executive in the high tech sector with extensive experience managing rapid growth organizations. He has a broad technology background with proven skills in computer systems, avionics industries, and health care information technology along with direct functional experience in finance, sales, marketing, engineering and corporate management in both domestic and international settings.

Education: Thayer School of Engineering, Dartmouth College; Master of Engineering 1976; Master of Business Administration 1975; Bachelor of Engineering 1970.

PAPERS AND PATENTS for Clint Seward:

Chen, C., Pakter, R., Seward, D. C. "Equilibrium and Stability Properties of Self-Organized Electron Spiral Toroids." Physics of Plasmas. Vol. 8, No. 10. October 2001.

Seward, C., Chen, C., Ware, K. "Ball Lightning Explained as a Stable Plasma Toroid." PPPS-2001 Pulsed Power Plasma Science Conference. June 2001.

Seward, C. "Propulsion Using a Stable Plasma Thruster." STAIF 2001, (Space Technology and Applications International Forum-2001). American Institute of Physics , www.aip.org/catalog/conforder.html. February 15, 2001.

Seward, C.; Chen, C., Temkin, R. ENERGY STORAGE DEVICE , US Patent 6,140,752, October 31, 2000.

Seward, D. C. Electron Spiral Toroid; US Patent 5,773,919; June 30, 1998.

Seward, D. C. Energy Storage System, US Patent No. 5,589,727. December 31, 1996.

Seward, D. C., Chen, C., Temkin, R. (1996b). International Patent Application WO 96/38848, Energy Storage Device, Published December 5, 1996.

Seward, D. C. Fixed Geometry Plasma and Generator, US Patent 5,175,466. Dec. 29, 1992.

ESP's President Clint Seward collaborated with Gary Vesperman in writing a description of Seward's invention in www.padrak.com/vesperman. See "Locomotive Power Sources".

The Products page of www.electronpowersystems.com sells a book "Ball Lightning: Leading to Clean Energy" and a paper "Spheromaks Observed Forming in Atmosphere". Paper's abstract:

Plasma toroids, called spheromaks, are reported here as observed forming in partial atmosphere from high power electric arc events similar in power to lightning ground strokes. The spheromaks are observed to be stable in partial atmosphere with no confining magnetic fields and are observed to last for more than 200 milliseconds in partial atmosphere. This paper describes the observations and presents a model that explains the properties of these spheromaks, which we call Electron Spiral Toroid Spheromaks (ESTS's) due to the spiraling motion of the charged particles. It includes four TV images. The model presented is a hollow toroid with a thin outer shell of electrons that all travel in parallel paths orthogonal to the toroid circumference, in effect spiraling around the toroid. A comparable inner surface of ions acts to neutralize the space charge. The paper provides formulas describing the ESTS. Potential ESTS applications include X-ray production, air defense, and energy production.

The cost to produce a 10-kilowatt EST Spheromak electricity generator would be about $1100 in production quantities. The EST Spheromak generator would have fewer parts than a comparable Sears generator.

Electron Power Systems, Inc., does not have a working prototype. The company has identified the instrumentation and needs another $100,000 for laboratory work. With $2,000,000, the company expects to have in two years a demonstrable prototype. In an additional year for $8,000,000 a production prototype is expected to be built. Remember, each piece of the project uses technology others have demonstrated.

Clem Over-Unity Vegetable Oil Engine

Richard Clem was a heavy equipment operator who had noticed that a hot asphalt sprayer would continue to run for up to an hour even after the power was turned off! So he built a modified version as a 200-pound engine which ran on vegetable oil at 300 degrees and was started by a 12-volt battery. The heat is internally generated by the engine. During a nine-day test conducted by Bendix Corporation engineers, the engine in its self-running mode consistently generated 350 horsepower into a dynamometer. The engine is constructed from off-the-shelf components except for a hollow shaft and a custom cone with enclosed spiral channels.

If the automobile industry adopts the Clem over-unity engine, motorists could change its eight gallons of vegetable oil only every 150,000 miles and never buy any gasoline. To illustrate the engine's durability, the only working model of the Clem engine has been continually running on his son's farm for several years.

Combining the Clem over-unity engine with the hydrosonic pump could provide distilled ocean water as well as hot water for space heating, kitchens, and bathrooms at *no* energy cost.

The Clem over-unity vegetable-oil engine is not patented. It may be fairly straightforward to set up a small machine shop for manufacturing hollow shafts and cones.

Thin-Film Electrolytic Cells

A number of seasoned technology integrators have developed thin-film energy storage technologies which hold considerable promise. Dr. George Miley, Dr. Robert Hockaday and others have developed thin film technologies with energy densities exceeding 250-400 watt hours per kilogram. Dr. Miley's invention is illustrative. Using a flowing pack-bed type electrolytic cell with 1-molar $LiSO_4$ in light water, 1mm plastic beads with a very thin [500-1,000 angstrom] film of metal [nickel, palladium, titanium] are employed. A special sputtering technique is used to spray the metals onto the surface of the beads. With 2-3 volts of electrical power and 1.5 milliamperes of current, the single film experiments have shown the material to produce more than 10 times as much output power as input. The input power is no more than 0.01 watts while .5 watt of heat is produced.

It is likely that the physics involved in this reaction involve the release of energy as a by-product of nuclear transmutation. Dr. Miley has written, "The key finding from these studies has been the observation of a large array of "new" elements (i.e., different from the original bead coating), many with significant deviations from natural isotopic compositions, after the run.

Great care has been made to ensure that these elements are distinguished from isotopic impurities by use of a "clean cell" with high purity components and electrolytes, in addition to the pre-and post-run analyses. Even low-energy radiation was detected from the bead days after each experiment. Applications to space power, providing a 1-kilowatt cell with only 500 cubic centimeters of active electrode is predicted." Note that this particular invention, with its large over-unity energy yield, was awarded a NERI grant by the DOE. At the insistent urging of the American Physical Society and representatives from MIT and other universities whose laboratories are currently engaged in high-temperature gas-cooled nuclear reactor research, Secretary Richardson eventually withdrew the grant. The tangle-footed Department of Energy actively discourages the development of new sources of energy, presumably to appease the oil, uranium and coal companies. The U.S. Patent Office has unfairly classified secret nearly 5000 energy patents. Luckless energy inventors then risk 20 years in prison if they work on, sell, or publicize their energy invention – often created at great personal sacrifice.

Searl Effect Generator

The Searl effect generator (SEG) can be used to charge the batteries in a self-powered electric vehicle. A solid-state device, the heart of an SEG is a series of three concentric magnetic rings with magnetic rollers going around the rings. Both the rollers and rings are comprised of four layers of titanium, iron, nylon, and neodymium.

The magnetic fields impressed on the rollers have both AC and DC components. The AC component is for floating the rollers so they don't touch the rings. The DC component is to prevent them from flying off. The innermost set contains a minimum of 12 rollers for the same reason that a linear motor will not operate with less than 12 phases.

The inner set of rollers travel around at 250 miles per hour, the middle set travels at approximately 600 miles per hour, and the outer set at approximately 1500 miles per hour. Hundreds of millions of volts are generated the energy of which is picked up by brushes positioned all around the outside set of rollers.

An SEG also creates an anti-gravity field. An uncontrolled SEG will rise about 50 feet as the rollers increase speed, emit a light blue halo which indicates energy is being extracted from the ether, and then shoot up into the sky gaining speed, never to be seen again. At least one roof has been holed by an SEG. The friction-less rollers can be prevented from reaching the critical velocity that produces lift by use of a “governor”, either mechanical or electronic.

An SEG can be easily controlled by immersing it in an electromagnetic wave field the frequency of which is a harmonic of the SEG’s primary frequency. While in resonance, the magnetic poles of the rollers reach a unification state, and they stop moving.

The inventor has built and flown a small “inverse gravity” vehicle. A flying saucer-like SEG-powered aircraft about the size of a bus is currently being built in England by a private group.

The inventor for some years independently powered his house off the power grid with a home-sized electrical generator version of the SEG. A householder could set up a 45 x 45-cm unit and generate an output of 11 kilowatts of free electrical power.

Oddly, a house powered by an SEG has been observed to have greater healing powers than conventionally electric powered houses. The healing effect is claimed to be due to the electrons zapping the occupants, taking away pain and returning blood more quickly to damaged tissue. The SEG would also help combat asthma, bronchitis, hay fever and lung complaints due to the increased supply of oxygen in the body. Conventional methods of electric power do not pump out electrons which results in tired eyes and a tired brain.

The SEG's negative charge also means that dust stays in the carpet instead of floating in the air. This is similar in action to negative ion generators sometimes sold as air fresheners.

Two Russian scientists replicated the Searl effect generator and vindicated all of these somewhat unusual claims. See their paper “Experimental Research of the Magnetic-Gravity Effects”, V. V. Roschin and S. M. Godin, Institute for High Temperatures, Russian Academy of Science, Izhorskaya 13/19, Moscow 127412, Russia.

At one time, a German power company reportedly considered replacing a nuclear power station with eight fuel-less SEGs costing a total of about $4.5 million and generating a total of 240 megawatts with no pollution.

Noble Gas Plasma Engine

Joseph Papp was granted US Patent #3,670,494 for his “Noble Gas Plasma Engine”. A mixture of recycled inert gases (helium, neon, argon, krypton, and xenon) is exposed to a high-voltage discharge in a sealed cylinder with a piston. The spark causes the gases to expand violently though no combustion occurs. Mechanical energy is delivered by the piston's displacement. The gases immediately collapse to their original density, and the cycle is repeated. After several thousand hours the gases lose their elasticity and are replaced. The operating cost is 15 cents an hour.

The first prototype was a simple 90-horsepower Volvo engine with upper end modifications. Attaching the Volvo pistons to pistons fitting the sealed cylinders, the engine worked perfectly with an output of three hundred horsepower. The inventor claimed it would cost about twenty five dollars to charge each cylinder every sixty thousand miles.

There were indications that such an engine could provide its own electrical power and being a closed system, require no fuel. It is not by definition an electromagnetic engine, however. It is believed that at the heart of the Papp engine is the development of high-density electrical charge clusters which provide the energy to expand the gases.

Other patents are 5319336, 4151431, 3670494, 4046167 - Mechanical Accumulator, 3680431 - Method and Means for Generating Explosive Forces, and 4,428,193 - Inert Gas Fuel, Fuel Preparation Apparatus and System for Extracting Useful Work from the Fuel.

Magnatron – Light-Activated Cold Fusion Magnetic Motor

During the late 1970's Howard Rory Johnson, a brilliant inventor in Elgin, Illinois, combined light-activated cold fusion with a new type of magnetic motor into a "Magnatron". His prototype Magnatron produced 525 horsepower but only weighed 475 pounds. It could propel a large truck or bus 100,000 miles on about 17 ounces of deuterium and 1.5 ounces of gallium before being recharged. This was years before either Pons and Fleischman or Dr. James Patterson entered the scene with their cold-fusion technology.

Johnson discovered the light-activated cold fusion portion of the Magnatron by accident when as he was developing a new type of electronic circuit using deuterium oxide and gallium, he noticed the two materials were producing energy on their own. He could not figure out what was triggering the energy production for some time until he finally discovered it was light.

The Magnatron's flow of deuterium (an isotope of hydrogen) is controlled by magnetic tunnels. At the point where the deuterium strikes the gallium (a heavy metal electron donor), a beam of light from a diffraction prism forces their fusion. That controlled reaction results in the fusion of two atoms forming a new atom. In the process, electricity is released, and that is what powers the magnetic motor. The Magnatron is sealed, however, so 'light' is provided from photon energy produced from coils tied directly to the motor. It is more or less a pulse-generated system.

A photon is a football-shaped particle of electromagnetic wave energy. Its energy content is a product of its frequency f and Planck's constant h. When an electron in orbit around the nucleus of an atom drops to a lower, less energetic orbit, a photon containing the energy equivalent to the electron's energy drop is emitted. This explains why light and other forms of electromagnetic energy such as gamma rays and radar are sometimes observed as particles and other times as waves. The heated filament of a light bulb is an example of photon production.
There is no way to explain, using contemporary electrical theory, how his relatively small motor could produce such tremendous horsepower. Utilizing his own new electrical-magnetic energy theory, involving a process he called "attract-attract", Johnson exploited the magnetic field. He used the top and bottom rotors in his motor. First, the top rotor attracted, released; then the bottom rotor attracted, released. The action of attraction, alternating between upper and lower magnets, used the windings to complete the attract field.

Robert Nelson's compilation of articles about the Magnatron provides much more technical detail on the Magnatron than the foregoing. (See http://www.rexresearch.com/magntron/magntron.htm.)

Johnson constructed his prototype Magnatron's 525-horsepower magnetic motor without any of the hardware that is presently used in present state-of-the-art electric motors. Conventional motors use the accepted principle of attract-repel, an energy form that doesn't utilize the magnetic field to its greatest advantage. For comparison, a typical 500-horsepower electric motor has wires exiting it that are the size of a garden hose.

The sealed self-contained Magnatron has no wires. Thus, other than the Magnatron's infrequent refueling with small amounts of deuterium and gallium, the stand-alone Magnatron uses no input power. The Magnatron's entire output power is conveyed by its magnetic motor's rotating shaft.

Fuel for the Magnatron is plentiful: deuterium is derived from water, and gallium is extracted from abundant aluminum bauxite. Commercially available pure gallium is still scarce and expensive. It may well be possible, however, to cheaply transmute another less expensive element into gallium. See Gary Vesperman's list of over two dozen methods of neutralizing radioactive waste in http://freeenergynews.com/Directory/NuclearRemediation/Vesperman/ which includes possible transmutation methods. Additional methods are briefly described in http://freeenergynews.com/Directory/NuclearRemediation/. Dr. Santilli's method plus an explanation of suppression of radioactivity neutralization methods are available at http://www.nuclearwasterecycling.com/. Robert A. Nelson's survey "Transmutations of Nuclear Waste" is at http://www.rexresearch.com/articles/nukewa.htm.

The Magnatron uses no fossil fuel in its operation, and it emits no pollution. The magnetic motor's RPM is 8,000 with a gear ratio of 2:1. Lubrication for the sealed motor is synthetic motor oil which does not need changing and does not need a filter, because foreign materials such as carbon and varnish are not introduced into the system, as they are in the internal combustion piston engine.

This writer, Gary Vesperman, attended the 3rd International Symposium on New Energy in Denver, CO (April 25-28, 1996). I remember being impressed by Gerald Orlowski"s lecture "Magnatron, Fusion Magnetic Motor", during which he provided substantial technical information on the Magnatron.

Orlowski reported that, "Some inside information revealed that OPEC had been keeping track of all competitive technology", and Johnson was #1 on their hit list! Johnson was about to manufacture the motors through a nationwide dealership. Some motors still exist, but the owner wants several million dollars for them."

This writer Gary Vesperman knows of very few inventions of new energy sources which are reasonably large stand-alone energy producers. Besides the Magnatron, they include Oleg Gritskevitch's hydromagnetic dynamo, and Electron Power Systems' micro-fusion reactor, which employs stable high-density plasma electron spiral toroids. Almost all inventions of new energy sources are, or claimed to be, relatively small over-unity power converters that convert input power to greater amounts of output power. Bob Dratch's thorium powerpack is an exception (see above).

At the September 14, 2005 public meeting in Green Valley Ranch casino regarding the proposed Regional Fixed Guideway traversing Las Vegas, Nevada, this writer Gary Vesperman submitted comments suggesting possible power sources for the train, including descriptions of the hydromagnetic dynamo and the micro-fusion reactor (http://www.rtcsouthernnevada.com/rfg/documents/September2005PublicMeetingMinutes.pdf, pp. 19-77).

No wonder the Magnatron's inventor, Rory Johnson, was rumored to have been "Number One" on Organization of Petroleum Exporting Countries (OPEC)'s hit list.

The following is an excerpt, slightly edited, from Orlowski's lecture transcript where he tells about his unwitting personal involvement with the U.S. Government's suppression of the Magnatron:

"After I saw the Magnatron motor, my life changed. I was no longer a happy camper working by myself in a wonderful, fully equipped research machine shop for the Greyhound/Armour Corporation in Arizona. While on a business trip, I saw this motor running in the Magnetron, Inc.'s showroom located in Eglin, Illinois.

"During my 15 years of electric motor repair, among the hundreds of motors I repaired, I rewound a 500 HP electric motor. That motor had wires exiting it that were the size of a garden hose. The Johnson motor being shown had NO wires. Surely this motor was unreal, a con-job to get money for dealerships. Yes, there he was, Rory Johnson standing next to his sealed self-contained electric motor.

"Upon returning to the Greyhound Towers and telling them what I had seen, they instructed me to call Mr. Johnson. Greyhound wanted Johnson to put forth a plan to install a motor in one of their buses for testing purposes.

"I called Johnson. He was delighted that a Greyhound employee had seen the motor running, and replied that the testing idea was acceptable. He would set a time frame for just when a bus should be delivered to him.

"Two years went by, with no business proposal from Johnson. Then, his former business partner, Mike Marzicola, called to say Johnson had passed away. He wanted me to work with him to get one of the motors running. I flew to Orange County, CA, saw the motor, took pictures, and put forth a plan to Greyhound. Subject to a contract with Marzicola, one of the old worn motors would be brought to the research shop. I would then very carefully reconnect the generator wires that Johnson had cut off prior to moving from Elgin, IL to California.

"Discussions with Marzicola brought out that the U.S. Government (given the authority by the Congress of 1952) had issued a GRAB order to take Johnson's motors. Rumor has it, the DOE is run by US oil companies and OPEC, and they want no competition, period. Because of this grab order, Johnson had cut the generator wires. He had then put his `total shop', with motors and all, on several U-Haul trucks and left Illinois in the middle of the night. He went to California to re-establish his business. But before he could get a motor running, he passed away.

"Surely, Greyhound would agree to let me re-start one of Johnson's motors. The wonderful proposal put forth to Greyhound was rejected by mail. Very agitated, I went to the top office at Greyhound demanding an explanation. I was met at the door with the comment, "We know why you are here." Knowing the potential savings to the bus company, surely they could have only one reason for rejecting the proposal. They must have believed I was not qualified to start up the motor.

"Greyhound's top legal advisor stated he was present when the Greyhound board met and discussed my written proposal. He stated the following, "At NO time was the thought put forth that you would not succeed. In fact, we discussed all of the hardware designed and constructed by you, and started the conversation from what happens when Greyhound has a running motor. We contacted a State representative who felt this motor should not be allowed to be used in 4,000+ buses. The loss in tax

dollars for fuel alone would be a very huge sum." He then asked me to leave, stating he was sorry that he had to tell me the reason the plan was rejected.

"Telling Marzicola of the rejection, I offered to personally put in a few thousand dollars toward the parts to get one motor running. In return, I would be assigned the dealership for the Phoenix metropolitan area. We signed legal papers in exchange for the money agreed on, and went to work. (I still have the signed dealership.)

"The first thing I noticed was that someone had been working on repairing the motors. Three motors already had new commutator assemblies installed. Each assembly consisted of 3 commutator assemblies on one insulated tube with a metal case to secure it to the shaft.

"One motor still had the old worn commutator assembly, as it had not yet been repaired."

Orlowski goes on to describe his reconstruction efforts and includes interesting technical details about the Magnatron's structure and theory.

Johnson did not know that OPEC tracks all potential competition to its oil business and that he was reportedly number one on OPEC's hit list. His first mistake was publicizing, in many magazines, his plans to manufacture and distribute his revolutionary motor.

Erik Masen has spoken with a few people who even signed up for distributorships. Erik Masen had included Johnson and his Magnatron in his energy invention suppression anthology (see http://www.electrifyingtimes.com/erik masen suppression.html).

In 1979, Johnson placed his engine in a Buick Electra and was preparing to drive it around the country to sign up more distributorships when the US Department of Energy and the State of Illinois teamed up to prohibit his company Magnatron, Inc., from producing and selling Magnatrons. They first placed a gag order on all the people in the company by using the Secrecy Act of 1952.

Secondly, the State of Illinois immediately requested the company to provide information about all of their employees, distributors, stockholders, investors, suppliers, etc. They asked questions that blatantly deny anyone's constitutional rights to privacy. The pressure from the State of Illinois became so overwhelming that Johnson decided to move his entire business to California in the middle of the night.

After a year of hearing nothing but silence from Johnson, Greyhound agents tried to contact him – only to be notified that he had passed away unexpectedly. This is a particularly troubling part of the story, since he had been in his early fifties and in robust health. Later, Greyhound learned that shortly before he died, Johnson had inexplicably moved out of his laboratory in the middle of the night and taken all of his motors and technology to California.

Bob Bass, in his report copied below on low-energy nuclear transmutation, claims that the CIA, the KGB and the Mossad, etc. all have "sprays" which can be sprayed upon someone and cause him or her to die of apparently natural causes. One speculation is that Johnson's death – apparently due to heart failure – had been artificially induced by such a spray.

In a January 20, 2007 email to Gary Vesperman, Terry Sisson reports:

"Hi Gary,

"I visited Magnatron, Inc., in July 1979. I wish I would have taken a photo. Placards were placed over every inch of the large windows in the front of the building listing all of the questions the State of Illinois requested his company to provide. He wrote, "When has the government ever had the right to ask this of any company." I peeked in the front window and saw one of his motors mounted on an engine stand. Nobody appeared to be there so I walked around to the rear of the building. I found the rear garage door open and could see the Buick Electra inside. I was about to approach nearer when a man emerged. We talked, but he quickly informed me that due to a US gag order he was unable to talk about anything. I managed to get his phone number and called him from time to time for years following. He was an assistant of Rory's and he kept the information very close to the vest. He did tell me that it was real and it worked, yet not how it worked.

"About 1984, I began to call all the Johnsons in the phone book in Elgin. I finally got a hold of Rory's son. He too said that it was real, but I got nowhere. Around 1992, I met Jerry Orlowski, and he told me his experience as the employee of Greyhound who was sent to investigate the technology, since he wound electric motors for several years. Jerry was very upset about the whole incident, particularly Greyhound's Board of Directors refusal to utilize the technology after he found the technology to be authentic. Jerry even witnessed the government's seizure of the motors in California. --- Terry Sisson."

Hydro-Magnetic Dynamo

The hydro-magnetic dynamo is a doughnut-shaped large-scale emission-free electrical generator which does not requires external fueling and operates safely, reliably and silently at moderate temperatures. The dynamo is capable of powering larger transportation vehicles such as buses, trucks, ships, locomotives, and airplanes. Doubt remains about making dynamos compact enough to power automobiles.

The circumstantial evidence for the Russian inventor's performance claims for his hydro-magnetic dynamo is reasonably strong. While three experimental prototypes have been built with Russian and Armenian expertise and equipment, a fourth demonstration prototype needs to be built with more modern Western engineering expertise and equipment to verify dynamo performance claims and to further explore the dynamo's potential capabilities. Performance claims are as follows:

Hydro-magnetic dynamos are scalable from 100 kilowatts to 1,000 megawatts. One doughnut-shaped, fuel-less 1000-megawatt dynamo is about the size of a two-car garage. For comparison, Hoover Dam's 17 generators have a total nameplate capacity of 2,080 megawatts. Seven 1000-megawatt dynamos can be vertically stacked to comprise a single 7000-megawatt dynamo.

A dynamo can reliably run continuously for 25 years or more with little or no maintenance, no external fuel source, and no pollution. If a dynamo's output is 1,000,000 watts, its total input power is approximately 10,000 watts. So the dynamo's energy efficiency is 10,000%, or 100 to 1.

The source of the dynamo's massive electrical output is a nuclear reaction which is not generally known to mainstream science. However, it is known that the dynamo produces alpha particles which are helium nuclei made from fused deuterium, an isotope of hydrogen with one proton and one neutron. The electrons missing from the helium nuclei are what seem to provide a copious "sink" of electricity, and which happen to be the secret to the dynamo's ability to generate an exceptionally large amount of electricity.

It is also known that the dynamo uses high-density charge clusters. High-density charge clusters are the basis of plasma-injected transmutation of elements and also neutralization of radioactive materials.

There were three dynamo prototypes built. The first two small experimental prototypes were built in Vladivostok. The third and last prototype continuously generated electricity, except when turned off to incorporate improvements, from 1992 to January 1997 in Armenia. (It was sadly destroyed during an armed rebellion by local religious fanatics who were unhappy with the Armenian government.) It generated a constant current of 6,800 amperes at 220 volts DC. That multiplies out to nearly 1.5 megawatts. The Armenian prototype dynamo's toroid weighed 900 kilograms and had a diameter of approximately 2 meters.

Cooling water is circulated through copper pipes wrapped around the toroid. The heat is expelled from the cooling water with a heat exchanger.

After a dynamo is assembled in a factory, the water is literally jump-started (by discharging a large bank of capacitors) to moving around the toroid. The dynamo's controls are temporarily set to generating enough of a modest amount of electricity to sustain itself, even while being transported from the factory to its site. For the Armenian prototype dynamo, two 10-farad capacitor banks (from Russian military radar stations) were used to provide the initial water motion (acceleration and excitation of water). Using a total of 20,000 joules, 100,000 volts with 0.05 amperes of current were applied to the Armenian dynamo for 3 - 5 minutes for starting its generation of electricity.

After these Russian radar capacitors were used to jump-start the Armenian prototype dynamo, a bank of buffer batteries sustained continuous operation when water motion and ionizing occurs. This battery bank contained 8 powerful 12-volt, 150-ampere lead batteries. The Armenian dynamo's sustaining input power was 14,400 watts. The nominal maximum output power is nearly 1,500,000 watts. Once, the output current was accidentally increased to 40,000 amperes for almost a minute. Fortunately, the power was reduced to a safe level before the water started to boil. Internal coils (windings) control water velocity and therefore dynamo power.

The dynamo's production cost is estimated at $500 per kilowatt which is competitive to nuclear power’s capital costs of $5,000 per kilowatt, windmill capital costs of $4,000 per kilowatt, etc. A well-run nuclear power plant can generate power for 1.5 cents per kilowatt-hour, coal 1.8 cents, natural gas 3.4 cents, and oil 4.1 cents, on the average. The dynamo’s operating cost would be approximately .1 cent per kilowatt-hour with no external fuel needed nor pollution.

Dynamos could replace all nuclear power plants, solar installations, wood-burning furnaces, hydro-electric dams, windmills, fossil-fueled power plants, etc. Satellites, locomotives, heavy trucks, buses, airplanes, and ships are obvious transportation applications. It does not seem that dynamos can be made compact enough to power electric cars although it certainly would be worth trying.

A Forbes article states that PECO (formerly Philadelphia Electric Company), with an income stream to back it up, was able to sell on Wall Street $4 billion worth of bonds paying 5.8 per cent. A dynamo manufacturer could simply sell bonds to build and operate dynamos at a low interest rate. Dynamo loan payback times may be in the ball park of a half-year to a year, depending on the local electricity market price. As soon as a dynamo is paid for, the revenue from that time on would be almost pure profit.

Once a track record is established by successfully installing a few dynamos, the dynamo company could raise money to build more dynamos by simply selling billions of dollars of bonds instead of stock. So therefore, there wouldn't be any dilution of ownership.

A recent IEEE Spectrum article stated that world demand for electricity increases approximately 500 megawatts every day. To put this in perspective, the equivalent of another Hoover Dam would have to be built every four days to keep up with world electricity increase demands. Or, a dynamo manufacturing company would have to build another 500-megawatt dynamo every single day of the year to keep up with world electricity increase demand in addition to replacing all existing generators fueled by hydro, nuclear, and fossil fuels.

The following is a highly condensed summary of the "Description" of the dynamo's Russian patent IPC H 02 K 44/00 “Method of deriving of electrical energy and organization of Gritskevich’s MHD-generator for its realization”:

The dynamo is a sealed toroid filled with distilled water with heavy water (deuterium oxide) added. Movement of water inside the closed loop and use of unique properties of water as a polar liquid cause a release of electrical energy as an outcome of a rupture of hydrogen connections. Additional electrical energy is drawn from nuclear reactions and micro-cavitational processes. The liquid gets ionized and moving around the toroid at start-up time by a running magnetic field with the help of stimulating electromagnetic windings.

A layer of segnetoelectrical material covers the internal surfaces of the toroid. 32 electrodes made from a hard-alloy material are inserted into the toroid at equal distances apart. These 32 electrodes are connected to a power supply. Additional stimulation windings are also connected to the power supply.

The partially pre-ionized (on the part of the heavy water) water gets ionized further by the high-voltage discharges by the 32 electrodes. With the help of the stimulation windings, a running magnetic field is created which moves the water in one direction inside the toroid. An electromotive force gets created by the electromagnetic induction in a separate set of windings. During the movement of the water stream free electrons get created, and an additional energy gets emitted because of the water’s friction (viscosity) against the layer coated on the inside surface of the toroid, because of electrostatic breakdowns of cavitatal-vacuum structures, and because of the ongoing nuclear reaction. 100 times as much electrical energy is generated as required for electrical energy input.

Note that the hydro-magnetic dynamo is always producing electricity once it is manufactured and jump-started at the factory. Whenever a locomotive is parked in sub-freezing weather, its hydro-magnetic dynamo’s electricity output would be used to heat the dynamo’s containment to prevent its water-filled toroid from freezing.

Whenever a locomotive is parked, its hydro-magnetic dynamo’s excess electrical output could be sold to the local power grid.

IPMS Energy Storage/Battery Device

During the summer of 1984, airborne intelligence surveillance teams of the United States Air Force, operating out of specially configured and equipped Boeing 707 airframes (called AWAC’s) electronically detected (and then shortly thereafter photographed) bursts of coherent light of

enormous power originating in the vicinity of Dushambe, Turkministan. The bursts of light, a brilliant blue-green color, lasted just a few seconds and were shifted almost to the ultraviolet end of the light spectrum. The "laser" beams were directed upwards out of the atmosphere towards American military communications satellites.

At precisely the same time the AWAC's detected and photographed the laser bursts (they were referred to in that jargon by American military analysts but later proved to be something almost entirely different), several of the satellites essential to America's global military command and control communications systems became inexplicably inoperable.

The Defense Intelligence Agency, under the direction of the National Security Council and assisted by the National Security Agency, escalated its surveillance of the remote site in the Ural Mountains from which the bursts first originated. For several months, during a concerted campaign of uninterrupted observation by AWAC's and American spy satellites, no additional bursts were observed or reported. Then, without warning, in the middle of the night nearly seven months later, AWAC's crews operating just outside the territorial airspace of Afghanistan detected similar laser bursts of lower intensity during a period of intensive localized ground warfare.

The Afghanistan bursts were apparently aimed at targets under attack by Soviet infantry units. The laser bursts continued in a sustained, localized but obviously mobile attack pattern, as frequently as four or five times per hour, until nearly sunset of the next day. Photographic evidence gathered at the time by the AWAC's crew, and later corroborated by photographs taken at the actual site of the fire fight and forwarded to the U.S. for analysis, showed that the targets of the laser bursts were ammunition and fuel supply depots located in the remote desert. Several of the ammunition and fuel caches had apparently been destroyed during the attack, as demonstrated by the evidence of explosions, fire, smoke and residual infra-red heat patterns detected, photographed and electronically recorded on-board the AWAC's.

All this information was transmitted (via encrypted communications bursts, routed through the military Global Command Control satellite system) to the National Security Agency (NSA), located at Fort Meade, Maryland. Analysts there recognized that they were looking at evidence of a weapons system which had never been observed before. They did not know what had produced the laser bursts. But they did know that the technology which made such a thing possible was not available to the countries participating in the NATO Convention. They were terrified at the implications of such a development.

Within hours, the information was packaged into classified documents and conveyed to the Joint Chiefs of Staff. The Joint Chiefs examined the information while they were being briefed by the AWAC's crews which had witnessed and recorded the events. After the briefing, the crews were dismantled, and their various members stationed far away from one another, with orders never to discuss the events they had witnessed. Officially, the laser bursts never had occurred.

Secretary of Defense Frank Carlucci took delivery of the packet at his residence in Falls Church, Virginia, three days later, at a private, secret meeting held in the middle of the night. No one has yet adequately explained why the Joint Chiefs waited three full days to brief the Secretary. Early the next morning, he was driven in a specially prepared bulletproof limousine to the White House. He personally delivered the information to the new President of the United States, Ronald Reagan. The content of the Secretary's report had an immediate, measurable impact.

It was this series of events which principally precipitated the Strategic Defense Initiative, a program of military defense and reprisal based on America's state-of-the-art satellite-borne laser-optical and particle accelerator technologies. The S.D.I. system was intended to provide the U.S. with a meaningful deterrent to further aggressive use of the technology developed by the Soviet Military.

There was only one problem with this system, aside from the fact that its astronomical costs almost bankrupted the American economy: it did not work. S.D.I. was designed to respond to a kind of technology which was not achievable in the West, and which could not be explained by any of the models, materials, technologies or sciences known in the West.

In 1985, the top-secret military version of the space shuttle, code named Atlantis, embarked on a special orbital mission. One of its mission assignments was to retrieve, examine or photograph the military spy satellites which had been disabled by the laser bursts recorded in 1979-84. The results of this investigation have not been declassified or released in any but the most censored version to the public. What we do know for certain, as a matter of publicly available non-classified information, however, is that each of the disabled satellites appeared to have had at least one, and in some cases as many as four or five precisely measured holes, approximately the size of an American silver dollar, melted completely through them from the outside.

The photographs taken of the satellites show evidence of intense heat, charring and carbonized residue evenly distributed around the perimeter of each hole. The evidence is clear and unmistakable – the satellites were disabled by a coherent beam of some sort, characterized by such intense energy that it was possible to melt consistently measured holes through the exterior and interior components of American military satellites, after having passed through the atmosphere of the planet and into space for as many as 325 miles. Such a thing has scarcely been dreamed of by the American military, much less put into any but the most nominally effective operational form.

After more than ten years of political, economic and technological wrangling, and after the expenditure of more than one hundred twenty billion dollars in largely ineffectual research and development efforts, it is inescapably clear that no amount of money or political pressure, no amount of geo-political posturing or economic sanctions was going to compel the disclosure or replication of the technologies which produced the results photographed over the Carpathian Mountains and the Afghanistan deserts. The Soviets had developed a weapons system which was so revolutionary that it could not be explained, replicated or defended against.

The Reagan Administration's lack of specificity about the nature of the implied threat to which S.D.I. was supposed to respond subjected the Administration, the Defense Department and the R&D proponents of the most prominent American aerospace corporations to an endless barrage of charges by the Press and the Congress. They were characterized as being disingenuous and accused of being unreasonably secretive during successive appropriations battles in the Congress.

The truth of matter is that the Administration and the Pentagon were not being disingenuous at all. They simply could not admit to the American public that they were attempting to develop an effective response to a weapons system which they did not understand and could not replicate.

There are a number of issues intrinsic to this set of circumstances, along with several dozen others which, though less well known or economically dramatic, are no less important from a technological standpoint. It is certain that the implication of these technologies has not been lost on those multi-national corporations whose entire capital structure may be threatened by the new

sciences, technologies and materials which have been developed in secret laboratories, hidden in caverns excavated beneath the Carpathian Mountains, in the former Soviet Union.

Over the past decade the West has enjoyed occasional gratuitous glimpses into the heart of Soviet science. Attempts to disclose or discuss these developments in the press have been ruthlessly suppressed by powerful special interests vested in both the public and private sectors.

The science which underlies the series of events recounted here remains at the outer limits of the most advanced technology of which the West is capable. The questions posed by the military and corporate analysts about this laser beam weapons system are far-reaching in their scope and implications. Some of them are illustrative:

1) New Model of Quantum Mechanics: The sciences and models of quantum mechanics which produced such stunning recent developments in the West as the laser and maser make quite clear how much energy is required to create a beam of coherent light powerful enough to penetrate the atmosphere, retain its coherence in spite of atmospheric diffraction (and other effects described in quantum mechanics as "thermal blooming"), and melt a two-inch hole clear through a satellite made of the most sophisticated alloys ever produced in the West. Except for limited short-distance demonstrations conducted with industrial grade lasers used in cutting operations, there is no known combination of materials or technologies extant in the West to make such a thing possible.

2) New Materials: The materials necessary to create an electrical charge large enough to power a device capable of producing such a beam certainly do exist. In quantum mechanics the term large enough does not make sense, but we can agree for the purposes of this discussion on the effect of it as represented by such commonly accepted constructs as frequency, voltage, current and ionic flow rates [as distinguished by the phenomenon of resistance].

Hydroelectric plants and large, fixed-base nuclear power plants are capable of producing enough energy to theoretically power such a device. But the energy bursts in both the Carpathians and the Afghan desert were generated by sources which moved from one location to another. In order to do that, several additional considerations must be addressed:

a. Portability: The power source would have to be transportable or be capable of storing sufficient energy to repeatedly power such a device. Western technology cannot produce either a portable power production unit or energy storage system capable of the performance requirements everyone agrees must be met to make the weapons system work, either in the laboratory or in the field. System portability was the most puzzling feature of the NSA/DIA report.

When carefully analyzed, the computer-enhanced enlargements of the photographs taken by the spy satellites and AWAC's crews failed to provide evidence of any tracks which could be attributed to wheeled or tracked vehicles operating in the precise locations and at the same time as the laser bursts which were observed. The implications of this set of circumstances was almost too much to believe – the devices were apparently either hand held or transportable and rechargeable in such a way as to allow them to be transported by one or more foot soldiers, without vehicular support.

b. Enormous Power Requirement: The materials and technologies used to construct a device capable of generating a beam of such enormous power and magnitude would have to be sufficiently advanced to enable the components to be transported without damage over significant distances in unpaved areas of very rough terrain. Such strategies, engineering techniques, construction technologies or materials do not exist in the Western inventory.

c. The continuous repetition of the laser bursts suggests that the devices can be operated repeatedly at short intervals of 12-15 minutes. This means they can be triggered with significantly higher frequency and intensity than anything which can be produced in the West, even for laboratory use. Industrial strength lasers used to cut metals require careful setup, accommodate only limited use in short bursts, require extensive cooling and must be continually recalibrated. These limitations obviously did not apply to the devices being operated in the Afghan desert. Analysts at AMTL agreed that the units would either have to be recharged via an external, independent device or somehow be capable of self-recharging in the field.

Such a thing is almost unthinkable by current Western military standards. Not only can we still not replicate the technology in any meaningful form, but the Soviets had refined the technology to a point which allowed it to be carried on the shoulders of ordinary foot soldiers and recharged in the field without motorized support.

Unbelievable! How was such a thing possible? According to some of the highly qualified scientists who scrutinized the photographs, it is not possible. The "Not Invented Here" syndrome is alive and well in the American engineering community. Some of them still insist that the pictures were either fabricated or demonstrate something completely different than this narrative suggests.

3) Energy Recharge-Batteries: How did such high-intensity laser beam generators get recharged in the middle of the Afghan desert, in the absence of powered support vehicles or fixed-based power plants? There are a number of possible alternatives. They could have been powered by some sort of advanced battery technology. It's possible, but if the battery technology used in the West is used as a model to support such a thesis, it would take a bank of the most sophisticated batteries ever designed by NASA, arrayed in series and parallel configurations larger than five full-sized Soviet T-60 tiger tanks to power such a device.

This theoretical battery bank, operating at 100% efficiency (which is not practically or theoretically possible; the best batteries manufactured in the West operate at less than 60% discharge efficiency), could conceivably produce enough direct current voltage (in a zero resistance super conductive circuit, which is not possible, either) to perhaps produce one burst of light equal in intensity to 20% of the power required to burn a 2-inch hole through a satellite moving at 20,000 miles per hour at a distance of 325 miles.
Soviet ground forces were generating bursts of this magnitude every 12-15 minutes for more than 10 hours with nothing but ground troops. During eight hours of this exchange, it was totally dark. Something pretty remarkable must have been going on to make such a thing possible.

4) Energy Recharge – Solar Cells: Another alternative would have been to have whatever energy storage devices were being used to power the "laser cannons" recharged by sunlight. The state-of-the-art in photo-voltaic cells produced in the West simply would not support such an undertaking. The very best solar cells ever produced in the West have been produced by the Japanese.

These cells operate at a maximum of 19% efficiency - that is, they convert as much as 19% of the ambient visible sunlight shining on a clear, cloudless day into ion flow, which then becomes low voltage direct electrical current flowing through a circuit. The Japanese panels require months per section to manufacture and literally cost more than their weight in gold to manufacture. They are very heavy and are so sensitive to vibration and calibration that once installed, they cannot be moved at all.

Photo-voltaic cells capable of providing enough electricity to recharge a theoretically infinite energy well would have to operate at efficiencies of 50-80% to recharge batteries of infinite electrical capacity with enough power to trigger such a device. Such cells would have to be very light weight and able to withstand extremes of heat, cold, vibration, dust, wind and other conditions encountered in a hostile battlefield environment. Nothing like that exists in the Western technological arsenal.

5) Dielectric Materials – Transformers and Capacitors: Another consideration must be reconciled before this issue can be theoretically put to rest. In order to produce a burst of coherent light of sufficient intensity to have the effect which was observed and recorded by the surveillance teams, the voltage and amperage required to support such a device would have to be staggeringly high. In order to operate at all, the voltage supplied to the system must be released all at once, not in a continuous stream but in a single coherent burst so intense that any materials known in the West would either evaporate or melt. Not only would the best dielectric materials known to Western Science melt because of the heat produced by such enormous energy bursts, but before a bolt of energy of this magnitude could even be released to such a device, it would have to be accumulated and stored somehow.

A similar set of requirements of a less dramatic type is present in all the electronic devices manufactured and marketed in the West. This includes the entire range of electronic devices such as VCR's, computers, televisions and sound components, telecommunications, information storage, transmission and retrieval systems of every kind. We could not live as we do without them. The components which convert, store and release ion flow into the circuitry of these devices are known as transistors, transformers and capacitors.

This discussion delves into a slightly technical area here, so non-scientific types will need to either become familiar with the fundamentals of electricity to understand what is meant or simply give it a possibility that what is developed in the next section is a true representation of the way such things actually operate. The discussion deals with such commonly used and seldom understood concepts as voltage, current, frequencies and resistance.

(a) Transformers convert voltage at one level of current (amperage) to either higher or lower voltage levels. When the voltage is increased, the amperage or current is proportionately decreased. A low voltage produced at a high current level can be transformed into a much higher voltage at a proportionately lower level of current or "power."

(b) Capacitors: The decrease in amperage which accompanies a transformation of low voltage to higher voltage is often compensated for by a device known as a capacitor. In the most simplistic terms, capacitors "store" electrical energy until the amount of voltage and current reach a certain minimal threshold. When that point is reached, the entire store of energy is released all at once in a single burst.

The tantalum materials used in the West to manufacture such devices conform to certain standard rules which are commonly accepted by electrical engineers. These rules have only recently been stretched by new technologies and materials developed in the West. For the purposes of this discussion, though, it is safe to say that electrical engineers have long relied on these rules because they have always produced the same results when applied in the same way. Here's an example.

It is standard engineering fare which dictates that a transformer capable of accommodating one volt at one ampere of current across a grid of one ohm of resistance will be one cubic meter in

dimension. If followed to its logical conclusion, this standard rule of electrical engineering would require that a transformer capable of supporting a laser burst device of the kind operated by the Soviet ground forces in the Afghan desert would have to be approximately the size of a building built on a base 100 feet to a side, nearly 150 feet high.

Surely such a device could not have been hidden from the AWAC's eye in the sky which can clearly photograph the letters on a license plate from 60,000 feet altitude, nor could it have been moved on the shoulders of ground troops without wheeled vehicular support. The fact that there was absolutely no trace of such a huge, massive transformer device (or any other kind of structure or vehicle which could be construed to serve that purpose) means that something else must have been used instead. Military analysts had absolutely no idea what it could have been.

Such a burst system cannot operate without a capacitor of some sort. A capacitive device capable of storing the amount of energy required to power a single burst from a laser cannon, made of the most advanced dielectric material known in the West, would have to have been equally massive and, further, would have to have been cooled by some sort of strategy which would have been instantly and unmistakably detected by the infrared cameras and spectroscopic scanners used aboard the AWAC's and the spy satellites which investigated the scene.

The practical requirements of such a system are best demonstrated by the massive equipment required to operate and cool the Super Conductor Super Collider linear particle accelerators recently designed by the United States and Japan. No evidence of any such capacitive device was recorded in either the Carpathian Mountains or the Afghanistan desert. How can we explain it?

Without going into any detail about how the technologies were developed, suffice it for now to say that the Soviet ground forces in Afghanistan were equipped with a prototype of a hand-held plasma beam accelerator, the likes of which had only been roughly imagined by American military analysts. The device relied on some innovative strategies. Among these were:

Energy Storage Devices: The power source for the Soviet light cannons was comprised of a back-pack array of specially designed energy storage devices. The closest thing we have in our vocabulary to compare to them is described by the term "battery." In the limited sense that these devices store electrical energy, they are batteries. Any other similarity to the batteries we are accustomed to in the West ends there. The literal translation of the Russian name for them is energy accumulators.

The batteries relied on in the West are based on the chemical properties of components which, when combined in certain configurations and proportions, interact chemically with one another. The result of this chemical interaction is that it creates both heat and a stream of liberated ions – electricity. In dry cell batteries, the process of chemical interaction is one way – once they have been expended, they are simply disposed of. It is estimated that more than 12 billion expended dry cell and lead-acid batteries are dumped into America's landfills every year.

Other batteries are designed and constructed so that the chemical reactions which liberate electrical current are reversible in some degree. These rechargeable cells are characterized by the lead-acid batteries which are used in automobiles and in commercial and industrial applications. Various strategies have been developed to make batteries relying on chemical reactions maximally effective, but the theoretical limits of effectiveness of such devices have surely been reached.

A consortium of aerospace companies working with NASA recently announced the development of an advanced sodium-hydride-based rechargeable cell which is the most efficient battery yet invented in the West. Unfortunately, it operates at an ambient temperature of 2000 degrees centigrade and, if allowed to reach temperatures outside a very narrow safe operating zone, will explode with the force of a small thermo-nuclear device of approximately ten-kiloton yield. It is not safe, but it is the best Western science has come up with.

The energy storage device developed by the I.N. Frantsevich Institute for Problems of Materials Science (IPMS), Kiev, Ukraine, works on a completely different principle. Its construction is the result of a completely unique nonlinear quantum mechanical model which makes it possible to create crystalline lattices of absolutely pure carbon (and other materials) in sheets of infinitely variable dimension which are exactly one molecule thick. The crystal formation techniques and the whole body of new science which allows for their creation in the first place are completely unknown to Western science.

The mono-molecular sheets deposited by this technique are wrapped back and forth on top of each other, more than one million times per millimeter, and are separated from each other by a distance of less than one atomic diameter. At this level of construction, the material becomes subject to the rules of quantum mechanics which are almost entirely probabilistic. That means a whole atom of carbon (or almost anything else except an electron or photon) will not fit in the space which separates the lattice sheets.

When viewed under an electron microscope, the sheets produce a pattern which looks for all the world like an endless field of four-sided pyramids, connected base to base, on a single plane, with the tips of the pyramids protruding endlessly, uniformly upwards. When wrapped back and forth on top of each other, these sheets of pure carbon crystal, made of carbon molecules shaped like trillions of identical tiny pyramids, all arrayed endlessly in identical formation, are positioned so that the tips of the pyramids on the bottom sheet are matched with the tips of the pyramids on the top sheets. What remains between the pyramid tips are open “spaces” or energy wells.

The quantum physics which describes the characteristics of the energy wells created between the layers of crystalline lattice is largely unknown to Western physicists. The Soviet model predicts with a high degree of probability that the quanta of energy referred to in the West as electrons (and, in some cases, photons), the stuff of which electricity is made, will, when introduced to the lattice structure, search, find and fit into the energy wells with military precision.

During the recharging or loading phase, the energy storage devices made of the crystalline lattice material channel one electron at a time into each well created by four carbon pyramids on the bottom layer and four carbon pyramids on the top layer. Because the rules of quantum mechanics which operate in this tiny environment demand it, each electron or quanta of energy has a certain polarity, spin and “color” (and other mathematically defined characteristics) which must be accommodated if it is to find, fit and stay in an energy well. Interestingly enough, when a current is applied across the lattice-work structure, the electrons behave precisely as nonlinear quantum mechanics predicts they will. They flow much like a fluid into the lattice field, then separate into individual energy quanta and spin into the last energy well in each layer, automatically adjusting their individual spin, polarity and color to match their characteristics to fit the requirements of each well, until the lattice is full.

Because no chemical reactions are involved in the process of marching electrons into or out of the energy well fields, there is no resistance in the circuit. In the absence of resistance, the electrons fill

the wells at light speed, never missing a space, automatically adjusting polarity, spin and other characteristics, and creating no heat. The amount of time required to "charge" such a cell is less than 5% of the time required to recharge a conventional chemical battery of similar voltage and current.

The validity of $E = MC^2$ is called into question by the way these devices function. When the battery is fully charged, it actually demonstrates more mass than when the energy storage device is empty or discharged. The laws of quantum mechanics relied on in the West state categorically that this is not possible. It is the answer to the question, "How much does a beam of light weigh?"

According to the Soviet model, this is precisely as it should be. When this phenomenon was first demonstrated to scientists in the West who were testing the energy storage devices at INEEL in Idaho, they were thunderstruck. The quanta of energy, or electrons as we refer to them, which are poured into the crystalline lattice demonstrate characteristics of mass even though they are bundles of pure energy sitting in stasis, literally at rest. The characteristic of mass is verifiable – you can measure it by weighing the energy storage devices before and after they are charged. When they are charged, they demonstrate appreciably more mass than when they are fully discharged.

If this is confusing to you, to suggest that pure energy can be shown to demonstrate verifiable mass while at rest (in stasis), perhaps you can begin to appreciate how fundamentally different the physics of all this is when viewed in the terms of Einstein's classic equation $E = MC^2$.

The existence of this technology clearly is proof positive that not only does energy demonstrate the characteristics of mass, but it does so in a state of non-motion or stasis, sitting idly in an energy well. A state of stasis is a very far cry from the terminal theoretical velocity required by the constant in Einstein's equation, equivalent to the square of the speed of light.

The scientific implications of this phenomenon are truly staggering. At very least, the verification of mass as a property of energy quanta at rest suggests that Einstein's theory of relativity may be altogether incorrect as a means of describing the dynamics underlying the real nature of the material world and its relationship to energy.

The existence of this technology suggests at very least, that energy and mass are equivalent characteristics of all things which are manifest in the material world. It is this fundamental contextual difference which distinguishes the Soviet model of quantum mechanics from the Western model. "The proof of the pudding," they say, "is in the eating."

Theoretical physicists may argue endlessly about the validity of the assumptions relied on by the IPMS scientists to develop their unique sciences, technologies and materials. But they cannot argue about the existence of the materials which have arisen from that context. They are as real as they can be. And they are unlike anything ever seen or contemplated in the West.

In the same way energy quanta stored in the energy wells of crystalline lattice materials demonstrate complete mathematical satisfaction with staying there indefinitely, when allowed to flow out in the form of an outgoing wave of electrical discharge, these quanta (electrons or photons, as you prefer) march right back out without resistance at light speed through a closed circuit to another use.

When these energy storage devices are discharged, they demonstrate other attributes which are not known in Western science, and which, because of the very nature of the chemical reactions we are accustomed to, are not theoretically possible according to conventional wisdom. Conventional

chemical batteries, when fully charged, produce electric current at a useable voltage for perhaps 30-40% of the total discharge cycle. After that, either the voltage or amperage (or both) drop to low enough levels that the devices being powered by them cannot recognize or use the electrical current which remains available. At that point, the batteries either have to be recharged or replaced.

The crystal lattice batteries have been demonstrated to produce precisely the same current and voltage levels throughout 98% of their discharge cycle. They produce no heat during discharge, regardless of the rate at which they are discharged. This is absolutely contrary to our experience with batteries, transformers or capacitors. Until the crystalline lattice materials were specifically engineered to register an electronically detectable blip at 95-96% discharge, it was impossible even for the scientists who developed them to distinguish a partially discharged battery from a fully charged one.

There is another characteristic which is intrinsic to energy storage devices which comes into play here. It is a characteristic of materials which is described as energy density. For non-scientific readers, this concept can simply be construed to mean the amount of measurable electrical current which can be produced by any device or material when its mass is converted into electrical energy. The concept is expressed in mathematical formulas as the number of watts and hours of consumable energy which can be converted from each kilogram of material. It is expressed as watt-hours per kilogram.

Here is an example we can all understand. Consider gasoline. When converted into electrical power at 100% efficiency, gasoline has been theoretically shown to have an energy density of between 550 and 600 watt-hours per kilogram of mass. In easy terms, that means that if one kilogram of gasoline were converted into pure electricity at 100% efficiency (with no loss due to heat, resistance, waste, etc.), the reservoir of energy would power a 100-watt light bulb for 5.5 to 6 hours.

Most of the high-end conventional automobile batteries of the lead-acid variety operate at an energy density rate of between 20-25 watt-hours per kilogram. The best NASA sodium-hydride batteries operate at 48-50 watt hours per kilogram. The energy accumulator devices which have been tested at the Idaho National Electronic Laboratories have demonstrated energy densities of between 850 and 1050 watt-hours per kilogram.

What does this mean in practical terms? It means, for one thing, that for the first time in the history of science an energy storage device has been created with an energy density which is greater than gasoline or any other refined fossil fuel. It means that devices which rely on these energy storage technologies can theoretically be designed to store and deliver clean electrical power at higher rates of efficiency than any fossil fuel ever discovered.

The global implications of this technology are irresistible. It means, among other things, that the technology exists, right now, to eliminate the need to build another nuclear power plant or dam another river to produce hydroelectric power. It means we can no longer justify burning another ounce of petroleum, another piece of coal, another cubic centimeter of natural (or unnatural gas) or another tree to produce heat, electricity or power for any purpose, including transportation.

When coupled with the plasma beam devices being tested by the Soviet infantry units in Afghanistan, these energy storage devices operated at such unbelievably high rates of discharge efficiency that they made it possible to repeatedly induce huge electrical discharges in a highly mobile configuration.

The same technologies which were used to produce the energy storage devices have been adapted to create transformers and capacitors with previously unimaginable performance characteristics. Instead of adhering to the conventional western model of "One Volt at One Amp across a resistance of One Ohm equals One Cubic Meter," the Soviets have produced a capacitor which measures more than 1200 farads at 10,000 amperes in a package the size of a tuna sandwich.

When tested by the Technology Materials Testing Laboratory of the Defense Department at the Pentagon and at the I.N.E.E.L. in Idaho, totally new testing equipment had to be designed, engineered and constructed just to test the devices. The scientists at those laboratories had never tested anything like these materials before.

Instead of having to house transformer and capacitor devices in a series of trailers towed by diesel tractors or huge fixed-base facilities, the operating apparatus which supplied transformed power and high intensity capacitive bursts to the light cannons weighed less than ten pounds and could easily be transported in a backpack by a foot soldier.

One final question remains unanswered. "How did the energy storage devices, once dissipated or discharged, become recharged in the field, especially in the dark of night?"

The back-pack plasma beam device detected by the AWAC's during limited combat use in the Afghanistan desert was powered by energy storage devices constructed of crystalline lattice materials. After each laser burst, the energy storage devices were recharged every 12-15 minutes (nearly 45 minutes in the dark of night – the residual ambient heat of the desert is a very efficient source of infrared energy) by sunlight, collected and converted to electricity by four-foot square panels of "solar cell" material arrayed on a pole like a flag, each weighing less than ten ounces.

The electrical energy stored in the back-pack energy accumulators was transformed into enormously high voltages and released at almost unbelievably high current levels when the super-capacitors were sufficiently charged. The beam of "light" detected by the AWAC's crews was a field of plasma, flowing at the speed of light and demonstrating characteristics of mass (and, therefore, kinetic energy). The phenomenon represented by these bolts of lightning are not comprehensible according to the model of quantum mechanics and plasma physics currently being used in the West.

Battery packs utilizing these energy accumulator materials have been designed, produced and tested which provide more than 14 hours of continuously transmitted power on a single charge to conventional hand-held cellular telephone devices. Similar improvements in conventional battery/energy storage capacity have been developed and are being tested for such devices as video camcorders, laptop and portable computers and other similar consumer, commercial, industrial and military applications.

IPMS research in the field of layered crystals has thus led to the creation of capacitors with a very high level of capacitance (measured in farads). This technology is based on a revolutionary production technique which forms polarized surfaces of one molecule thickness, separated by less than one atomic diameter of space, held together by weak Van der Waals energy forces. The special properties created by these layered crystalline structures provide previously unimaginable internal surface areas. Super capacitors are constructed of layered materials numbering more than one million dipole sheets for each millimeter of crystal thickness.

These devices provide a virtually limitless number of charge-discharge cycles at astonishingly rapid charge and discharge rates. The potential impact of such devices on all electronic equipment currently being produced is incalculable, since virtually all electronic devices rely extensively on the West's state-of-the-art tantalum capacitance technologies.

At present, IPMS has on hand (among others) a super-capacitor roughly the size and dimension of a sandwich which develops more than 1,200 farads at 10,000 amperes. It also boasts production of a battery whose active mass energy density exceeds 850 watt-hours per kilogram. For the non-scientist (and all the rest of us as well) this means that a "battery" has been produced which, for the first time in history, produces more power per unit of mass than any fossil fuel ever devised.

Prototype testing of larger-scaled devices designed specifically for providing power to electric vehicles is currently underway. Prototypes are expected to be capable of sustained highway speeds of up to 70 miles per hour with a range of 525 miles on a single charge. The power plant for this application has been recently improved by the inclusion of a proprietary solid-state ceramic electric motor which weighs 7.2 kilograms and produces 100 horsepower on 12-volt direct current. For comparison, an electric vehicle employing a 100-horsepower electric motor performs the same as with a 500-horsepower gasoline engine.

If these performance attainments can be sustained in broad-based applications, electrically powered vehicles could be produced which would meet or exceed virtually all performance characteristics currently available in equipment relying on internal combustion, petroleum-based engines. Gasoline/diesel-powered transportation devices can be replaced by cleaner, more efficient and significantly less expensive alternatives.

The world market for current energy storage applications which will be superseded by these energy storage technologies is estimated to be in excess of $24 billion per year (1991), exclusive of electric vehicle considerations.

Metamatter

9/25/1997 11:16 AM
From: Robert Bass
To: James Bowery<jabowery@netcom.com>;
CC: Robert W. Bass<rbrtbass@pahrump.com>;Gary Vesperman<vman@skylink.net>;
Subject: for the postulated "Bass page"?

Jim,

I just went to http://www.generalstore.com/ and see nothing but "under construction, etc." Is this you, or someone else in another state? Do you know how to (reasonably economically) do Mass-eMailings? Say either from a rented Data Base of known Investors, or just blindly to "millions"?

How about posting the following

Potentially Awesome Speculative Investment Opportunity?
==========
Venture SEED Capital? Low Risk, AWESOME Payback!!!

I seek one or more High-Technology-Oriented "High-Roller" Nerves Investor(s) who would be intrigued by the following proposition (if demonstrably sound and absolutely genuine): Suppose you go to "Super Monte-Carlo" in the sovereign nation of Erehwon, and you come to a table with a Croupier who says:

"I have here a coin the size of a U.S. silver dollar, which is perfectly evenly balanced between Heads and Tails to 10 decimal places [with the edge for Heads in the 11th decimal place]; and a certificate from the US Bureau of Standards certifying it is not "loaded" to favor either Heads or Tails to the best measurements they can make.

"You can flip the coin yourself.

"I have here Certificates of Deposit for $30 Billion in a centuries-old Swiss Bank of spotless reputation.

"My croupier's fee for allowing you to play is ridiculously modest.

"How much are you willing to wager on the honest flip?

"Now suppose the preceding scenario is repeated, except that several of the most reputable scientists in the world assure you that the coin is 'loaded' so that the chances of Heads are between 95% and 99%. Your own experts assure you that you have at worst One Chance in 20 of losing.

"Finally, the croupier says, you may play for $150,000."

To recapitulate, the odds are 20-to-1 that you will win $30 Billion, versus one chance in 20 that your entire $150,000 wager will be lost.

Would you play?

==========
-------PRIVATE Communication-----
------(NOT a Publication)--------
==========

I need Seed Capital of $150,000 under circumstances exactly analagous to those outlined in the Risk/Reward scenario above. If "Heads" comes up, then my patented Plasmasphere technology can be escalated to a Metamatter technology, where by METAMATTER I mean a solid, *crystallized* fully-ionized plasma.

An ordinary crystal has nuclei spaced apart distances of about 10^[-8] cm, the Bohr radius, because the electron cloud makes the atoms behave like little billiard balls of the size indicated.

However, in a plasma, the positively-charge nuclei and the electrons are equal in number, but the electrons are not in orbit around individual nuclei; they are "mixed up" as in a plum-pudding. Most plasma physicists will tell you that in order for hydrogen gas to be fully ionized (i.e., all electrons stripped from all nuclei) the temperature of the gas would have to be above 150,000 degrees Kelvin (i.e., 15 times hotter than the surface of the Sun). But this is demonstrably FALSE (both theoretically and experimentally).

If the gas is dense enough, it can be fully ionized at "low" temperatures, e.g. 5000 Kelvins [so-called "pressure ionization"].

Now suppose that the fully ionized low-temperature gas is condensed into the physical state of a liquid metal. I call this a Liquid Metallic Plasmoid (LMP). The characteristic of an LMP is that, like mercury, it keeps a constant volume; unlike a gas, it does not expand to fill all available space (if in a vacuum). The positive nuclei remain on average equidistant, and the electrons circulate around the dynamic lattice as in a giant crystalline molecule. Cook called it a "Cryscapade"; whereas others might call it a Liquid Crystal.

Fewer than a score people in the world understand that LMPs can exist. One LMP was photographed in half a dozen or so photos on the cover of the Journal of Applied Physics in 1957 by [later] Nitro-Nobel Medalist, physical chemist, Dr. Melvin Cook. The theory by which Cook explained his accidental discovery has been *independently* rediscovered (in 3 separate countries, USA, UK & France) by researchers seeking to explain the illusive natural phenomenon of Ball Lighting.

The late expert on High-Energy Lasers and Shock Tubes, Dr. Jay Blauer of Rockwell Rocketdyne, who died early of leukemia, helped me to design an experiment that would prove beyond shadow of a doubt that LMPs can be created at will. The basic idea is to use a combination of Shock Tube technology and High-Energy Laser technology, with my patented Plasmasphere technology, in order to achieve in a non-self-destructive, reusable device, what Cook discovered accidentally with high-explosives in a self-destructive experiment.

Once the mere EXISTENCE of producible-at-will LMPs is achieved (for the Risk Capital of $150K), it will be trivially easy to raise several million more for refinement of the device to move the LMP into a cryogenic vacuum chamber where (since it is electrically conductive) it can be magnetically levitated and allowed to cool by radiation.

Use of the Brush-Sahlin-Teller Equation of State (used to design the H-bomb) shows that as the LMP cools, its volume contracts, and it becomes more and more dense. There can be shown to scientists sufficiently expert to understand the evidence, a mass of recent experimental evidence (as well as expert theoretical evidence) that before the LMP gets down to room temperature it will crystallize into a Metastable Solid Crystal, namely a *new form of matter* never seen before on Earth!!!

The density will be intermediate between that of ordinary condensed matter and that of neutron stars, wherein a teaspoonful weighs tons.

I propose to manufacture 3 kinds of Micro-Crystals of Metamatter: MSP, MSD, and MSD. Each addresses in a truly *revolutionary* way a trillion-dollar market, with a multi-billion dollar profit potential. In many ways, Metamatter will have a bigger impact on human civilization than any prior discovery, including both computers and atomic energy! In fact, consider the following:

MSP (Meta-Stable Protium [hydrogen]) will be the IDEAL room-temperature Superconductor, which will revolutionized both the Computer/Electronics industry and the Electric Power industry.

MSD (Meta-Stable Deuterium [heavy-hydrogen]) will be the ideal 5th Generation Cold Fusion fuel; when triggered by an infra-red photon of 17.7 eV, a micro-pellet will undergo a phonon-mediated and Lattice-Catalyzed ANEUTRONIC chain-fusion reaction to cleanly release the energy of 10

sticks of dynamite, to make steam for mechanical heat and conversion at 67% efficiency into electrical energy. This can make both homes and automobiles independent of the present electrical utility companies, though they will still need to buy the almost dirt-cheap MSD fuel micro-pellets from Metamatter Industries.

MSH (Meta-Stable Helium) will be the IDEAL rocket propellant for expanding human civilization into the Solar System (e.g. to colonize Mars); when a micro-crystal of MSH is triggered by the right frequency of laser-light, it will return to the form of gas as if it had been compressed by tens of millions of atmospheres of pressure; it will release 43 times more energy per unit weight than any conceivable chemical combination!

During the mid 1980s, the Air Force Systems Command sent a group of 7 or 8 Colonels who held Doctorates in the physical or engineering sciences to scour the USA for 9 months, in groups of 2 or 3, and to report back on what futuristic technology would have the greatest potential impact on the USAF and USA economy by the year 2000 if reduced to actual practice. They listened to 600 industrial and academic presentations and selected MSH as the greatest payoff (for least risk) choice! The USAF Rocket Propulsion Lab was supposed to issue 8 parallel contracts for 8 "crash" projects to see if bulk MSH could be manufactured. I was slated to get one of the 8 contracts, but my approach (through solidifying a helium LMP) was radically different from that of the other 7 selected proposers.

With MSH as fuel, one could take a 50 percent payload to Mars and back in two weeks! (Accelerate there and return at one gee.)

But a Princeton professor of Physics, Will Happer, then Secretary of the JASONS [advisers to DOD/DOE], advanced theoretical arguments which appeared to shoot down the practicality of the other 7 approaches, and the whole project was canceled. But Happer's arguments are totally irrelevant to my approach. Moreover, Happer was later Chief Scientific Advisor to Admiral Watkins (Secretary of DOE) when the ERAB Report was produced.

Those who understand the recent work of Arata and Zhang in which the aneutronic conversion of deuterium nuclei to helium nuclei inside of a palladium lattice is recorded in Real Time (inside of a sealed apparatus which contains a Mass-Spectrometer and which give ZERO helium when the heavy-water deuterium is replaced by ordinary-water hydrogen) know that Aneutronic Cold Fusion (CF) is a demonstrable FACT and that Happer and the ERAB Report were WRONG. Therefore it is logical to consider the possibility that Happer was also wrong when, before he shot down CF, he also shot down MSH.

There is ZERO risk in producing an LMP; it is just that 99.999% of all scientists are ignorant of Cook's work.

There is a slight technical risk in crystallizing an LMP at room-temperature; conceivably, it will remain liquid until below the temperature of liquid nitrogen, in which case my proposal will have been a failure. But the payoff is so AWESOME, and the chances of failure so tiny, that the risk seems worth taking.

I can supply drawings of the Proof-of-Principle Process Prototype Plasmasphere demonstration designed by Dr. Blauer and myself. Jay Blauer told me that he could do the experiment in his spare time evenings and weekends "in two weeks" using shock-tube and laser equipment already in his lab at Rocketdyne, provided he had $10,000 cash for items and materials not on hand.

Several "reputable" labs have explained to me that they would not even consider bidding on doing the Bass-Blauer experiment for less than $100,000. I have personal contacts at 22 government and private labs (such as JPL, SRI, LANL, etc.) which I would like to visit with my former graduate student Dr. Lou Puls (who, unlike me, is an accomplished experimental plasma physicist) to make joint presentations on the theoretical and experimental aspects of creation of an LMP, preparatory to asking them to bid. After 22 weeks spent in such visits, (and paying Dr. Puls Consulting Fees) I expect to have $50,000 left to offer the Highest Bidder. I also expect that no one will bid less than $100,000. But I also expect that out of the 22 presentations, at least several will become so excited that they will offer to Cost Share. In several labs, the working-level scientists interested in LMPs have told me, "If you can get the Management to pay attention, we have in place already a mechanism and a precedent to Cost Share."

Remembering what happened to Fleischmann and Pons it will accomplish naught for me to take the $150K, rent the equipment, and do it in my own garage. Nobody will believe it, and nobody will pay any attention. However, if we spend 6 months getting suitable technical personnel of nationally reputable laboratories excited about the subject of LMPs, and then some lab with the prestige of, say, JPL or LANL or SRI, announces the production of an LMP, many other labs will immediately undertake to "catch up" and to replicate the result at their own expense. Once 3 or 4 labs have announced successful replication, no one will doubt and then it will be trivially easy to raise the venture capital to go from LMPs to solid, crystallized Metamatter micro-crystals of MSP, MSD, and MSH.

I can supply a large amount of written technical material to anyone who is interested in raising the $150,000 seed capital required to get Metamatter Industries off the ground (and for me to file the pioneering Patent Applications, and since I am now licensed to practice Intellectual Property Law before the PTO I can do it myself at no extra expense – as did the physicist/patent-attorney who invented the Xerox process).

This will be BETTER than getting in on the ground floor of Xerox or Polaroid or Microsoft!

Sincerely,

Robert W. Bass, M.A. Oxon, Ph.D.
Dr. Robert W. Bass, Registered Patent Agent 29,130 [ex-Prof Physics]
Inventor: Topolotron, Plasmasphere, issued; QRT Cold Fusion, pending
P.O.Box 1238, Pahrump, NV 89041-1238; phone/FAX (702) 751-0932/0739
Voice-Mail: (702) 387-7213 e-Mail: rbrtbass@pahrump.com

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XXX.YYY
XXX Venture Partners

Dear XXX,
Have you got your _____ Fund off the ground yet? Did you receive the Proposal I sent you last week?

Do you agree that the logic of the Analogy I used for the proposed Low-Risk, AWESOME Payoff, "Proof-of-Principle" (POP) Experiment is sound? If a rational Investor were convinced (e.g. by the photos published by Nitro-Nobel Medalist, Melvin Cook) that it is possible to put a plasma in the state of liquid metal (Liquid Metallic Plasmoids, or LMPs), and that the ONLY risk is that when cooled to room temperature they will not yet crystallize [but won't crystallize until down below, e.g.. the temperature of liquid nitrogen], which risk will be taken by OPM [Other People's Money] when the scientific community realizes that LMPs can be created at will, and that there is ZERO risk in performing the proof-of-principle demonstration experiment to convince them of this fact, and that this can be done for as little as $150,000 (which will also permit Patent Applications ensuring the inside track when LMPs get crystallized), don't you agree that the Reward to Risk Ratio of $3 X 10^[10]/$1.5 X 10^[5] = 2 X 10^[5] multiplied by the probability of crystallization at room temperature (which is supported by hundreds of theoretical papers on MSH and at least one recent paper in Physical Review Lettersw on MSP, as much, much better than 50%), namely an EXPECTED REWARD/RISK RATIO of more than 100,000-to-1 implies that this Proposal is "better" than any proposal made in this field yet, when you note that each of the 3 main products to be manufactured from crystallized LMPs, namely MSP, MSD, and MSH, EACH separately addresses a different Trillion-Dollar Market with a clear Profit Potential of more than $10 Billion?

Moreover, this is a Proposal in which the Investor who RISKS $150K will know within a mere 6 or 7 months WHETHER OR NOT Phase One of his speculation has paid off! (And it is highly likely that the Absolute Answer will be known within another 3 months, considering how fast the scientific community reacts to something, e.g. High-Temperature Superconductors, which is both surprising and EASY to replicate!)

Please tell me when a Speculative Investment Possibility better than this one has last crossed your desk? (I'll bet, NEVER!)

Regards,

Bob Bass

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Electrino Fusion Power Reactor

Gordon L. Ziegler has discovered how to make a clean electrino fusion power reactor capable of generating up to a net of 1880 megawatts of DC electricity. The proposed energy source would produce no carbon emissions and no radioactive wastes. (By reversing the order-to-disorder arrow in the second law of thermodynamics, a $50,000,000 electrino fusion power reactor could be built which would also reverse all aging, disease, and decay processes within a one-mile radius.)

Power output, however, cannot occur in this system without the simultaneous operation of two aspects of the invention. One is an accelerator-collider making a field reversing the order-to-disorder arrow in the second law of thermodynamics in a controlled area. Among other things, that field makes the other aspect of the system (the power source) efficient enough to be self-sustaining and prevents the formation of radioactive wastes.

Electrons are generally regarded to be structure-less spinning point charges. But that contradicts a reasonable postulate that occurred to Gordon L. Ziegler in 1967: “A spherically or cylindrically symmetric smooth charge distribution cannot have detectable spin.” Electrons have detectable spins. Therefore they must not have smooth structure-less symmetric charge distributions. They must be lumpy and have internal structure. An application of the Parsimony Principle shows that they must be composed of two half-charges orbiting each other at the speed of light. The reason scientists concluded that the electron was structure-less was that it could not be blasted apart in collisions up to 700 MeV each particle.

But in Ziegler’s model, electron sub-particles are bound together by confinement by a speed of light barrier (they are trapped going faster than the speed of light). They cannot be blasted apart, even though they are two particles.

The two sub-particles of electrons make a whole different structure for matter than quarks and leptons. The sub-particles can also fuse with each other – making new particles. Fusing sub-particles of positrons reverses the order-to-disorder arrow in the second law of thermodynamics – making the power source efficient enough to be self-sustaining and preventing the radioactive wastes from forming. Fusing the sub-particles of electrons comprise the power source.

Key components include a polarized positron source, injector accelerators, inflection magnets, end magnets, and the beam transport.

Governments and utilities would buy electrino fusion power reactors because the process is a clean, inexpensive way to produce electricity. It is 1000 times as efficient as nuclear reactors. It does not require uranium or plutonium for fuel. It can run on anything for fuel such as dirt, sand, sewage, ground garbage, toxic chemicals, radioactive wastes, sea water, etc. without carbon nor radioactive pollutants.

Assume that the collision energy were 940 MeV to avoid unwanted heat (operate at room temperature), and the current in each beam was 1.0 ampere of electrons. The energy investment into the electrino fusion would be 1880 megawatts. The energy released in annihilation photons would be 3760 megawatts. Recoverable net power would be 1880 megawatts or less.

The collision energy of the linear accelerator would be 940 Mev (each particle – 1880 MeV in the center of mass frame). The current in each beam would be 1.0 amperes of electrons. There would be two beams 180 degrees from each other.

The energy released in annihilation photons would be 3760 megawatts. "Annihilation photons" are the 940 MeV X-Rays produced when a negatron annihilates a proton. These X-rays are converted to electricity by order-to-disorder arrow reversed photo-voltaic cells with nearly 100% efficiency.

In summary the 3760 megawatts output of annihilation photons would be converted to electricity. However, in order to keep the electrino fusion reaction going, 1880 megawatts would be taken from the 3760 megawatts to power the linear accelerator. The net energy output would thus be 1880 megawatts-electric.

The size of an electrino fusion reactor would be about 80 ' x 10' x 10'. The fuel is whatever brass or copper James M. Potter uses in constructing the walls of his linear accelerators. James M. Potter, Ph.D., is President, JP Accelerator Works, Inc., 2245 47th Street, Los Alamos, NM 87544, 505-690-8701 or 888-301-2833 or 505-661-8155, jpotter@jpaw.com, http://www.jpaw.com. 155 lbs of

brass would be consumed over 100 years before shutdown for refueling. The linear accelerator would be a standard commercially available model. It would not need to be customized for an electrino fusion reactor.

The smallest electrino fusion reactor that would be possible to build is now about 80' x 10' x 10'. It may eventually be the size of a filing cabinet.

The projected cost of the first 1880-megawatt electrino fusion reactor is approximately $100 million. This clean source of electricity could be built in two years, and the necessary Refresher built in one year. Electricity could be generated for only about 1.5 percent of current rates (a little over 0.1 cent per kwh). Subsequent clean energy sources can be built for $37.5 million each.

The 1880 megawatts (net) of electricity generated by an electrino fusion power reactor would be Direct Current (DC). A utility would need thick wires and the biggest busbars and transformers on the planet. Conversion from DC to Alternating Current (AC) would require the world's largest inverters.

The electrino fusion reactor requires the Refresher to be self-sustaining. But the Refresher has several positive medical side effects due to reversing the order-to-disorder arrow that cannot be eliminated – in a controlled area reverse adult aging and wipe out diseases.

Refresher 1
Design Specifications

Size of accelerator	20 meters long by 3 meters wide
Diameter of channels	4 cm (maybe a little more to allow for water cooling channels)
Type of accelerator	Folded linear accelerator with pulsed klystron RF power supplies and S-band cavities (2856 MHz)
RF power supplies	Eight 35 to 50-megawatt pulsed klystrons
duty factor	0.1% (peak current 1000 times average current)
Average power	400 kW (20 kW per meter of accelerator)
klystron efficiency	~50%
total system power	800 kW
cooling water requirement for each 5 m section	5 to 10 gpm

cooling water required by each klystron	~ 5 gpm
cooling towers capacity	800 kW

Cost:

Linear accelerator	$12 million
Klystrons	$ 8 million
Klystron power supplies and cooling towers	$ 2 million
Magnets and their power supplies	$ 2 million
System with controls	$ 8 million
10% contingency	$ 3.2 million
Builder's cost	$35.2 million
Other budgeted items	$14.8 million
Total budgeted	$50 million

Creation time total	3 years
Design time (beam dynamics, rf power systems, cooling, and computer control)	1 year
Fabrication and subassembly testing	18 months
Installation and commissioning	6 months

(The following chapter is taken from *Formulating the Universe*, Volume II, by Gordon Ziegler, Chapter 7. Copyrighted by Benevolent Enterprises 2004. Used with permission.)

Chapter 7

SECOND LAW OF THERMODYNAMICS

A. Introduction

Everything goes from a state of order to more disorder. Brand new automobiles wear out and rust. Objects break or are damaged. A thermos bottle falls off the counter, and the inner glass bottle is shattered. We do not expect the shattered bottle to fall back up to the counter and become whole again. There is a one-way arrow for the events to transpire. That arrow is the Second Law of Thermodynamics.

Houses grow old and fall into decay. Barns fall down. Fruit spoils, people and animals grow old and die. Viruses mutate. People become ill and die. Crime and disorder in society increase. Homes break up. Aborted fetuses disintegrate. Dead people and things decompose. All of these negative occurrences are the outworking of the second law of thermodynamics – that part of which is an arrow making everything go from order to disorder.

Let us consider what other people have written about the second law of thermodynamics.

"Second law of thermodynamics

"An equilibrium macrostate of a system can be characterized by a quantity S (called *entropy*) which has the following properties:

"(i) In any infinitesimal quasi-static process in which the system absorbs heat dQ, its entropy changes by an amount

$$dS = \frac{dQ}{T} \qquad (7\text{-}1)$$

where T is a parameter characteristic of the macrostate of the system and is called its *absolute temperature*.

"(ii) In any process in which a thermally isolated system changes from one macrostate to another, its entropy tends to increase, i.e.,

$$\Delta S \geq 0. \qquad (7\text{-}2)$$

"The relation (7-1) is important because it allows one to determine entropy *differences* by measurements of absorbed heat and because it serves to characterize the absolute temperature T of a system. The relation (7-2) is significant because it specifies the direction in which nonequilibrium situations tend to proceed."[1]

The above expression of the second law of thermodynamics is regarding entropy and heat. Other writers include the order-to-disorder arrow in the second law of thermodynamics.

"It is a matter of common experience that disorder will tend to increase if things are left to themselves. (One has only to stop making repairs around the house to see that!) One can create order out of disorder (for example, one can paint the house), but that requires expenditure of effort or energy and so decreases the amount of ordered energy available.

"A precise statement of this idea is known as the second law of thermodynamics. It states that the entropy of an isolated system always increases, and that when two systems are joined together, the entropy of the combined system is greater than the sum of the entropies of the individual systems. For example, consider a system of gas molecules in a box. The higher the temperature of the gas, the faster the molecules move, and so the more frequently and harder they collide with the walls of the box and the greater the outward pressure they exert on the walls. Suppose that initially the molecules are all confined to the left-hand side of the box by a partition. If the partition is then removed, the molecules will tend to spread out and occupy both halves of the box. At some later time they could, by chance, all be in the right half or back in the left half, but it is overwhelmingly more probable that there will be roughly equal numbers in the two halves. Such a state is less ordered, or more disordered, than the original state in which all the molecules were in one half. One therefore says that the entropy of the gas has gone up. Similarly, suppose one starts with two boxes, one containing oxygen molecules and the other containing nitrogen molecules. If one joins the boxes together and removes the intervening wall, the oxygen and nitrogen molecules will start to mix. At a later time the most probable state would be a fairly uniform mixture of oxygen and nitrogen molecules throughout the two boxes. This state would be less ordered, and hence have more entropy, than the initial state of two separate boxes."[2]

"The explanation that is usually given as to why we don't see broken cups gathering themselves together off the floor and jumping back onto the table is that it is forbidden by the second law of thermodynamics. This says that in any closed system disorder, or entropy, always increases with

time. In other words, it is a form of Murphy's law: Things always tend to go wrong! An intact cup on the table is a state of high order, but a broken cup on the floor is a disordered state. One can go readily from the cup on the table in the past to the broken cup on the floor in the future, but not the other way round.

"The increase of disorder or entropy with time is one example of what is called an arrow of time, something that distinguishes the past from the future, giving a direction to time."[3]

B. Electrino Model and 2nd Law

The natural tendency of leptons in beta decay is that the parent lepton combines with one or more gravitons to produce more particles. In all natural reactions, the order energy of the resultant particles is less than or equal to the order energy of the original particles.

1. Negative Energies. Let us consider antimatter more carefully. "In the Dirac theory also, *the permissible energy values for a free particle range from $+mc^2$ to + 4 and from $-mc^2$ to - 4.* The first of these results is of course just what we expect for a free particle – that its total energy can have any value greater than its rest energy. But the second result is quite puzzling, since it implies the existence of states of *negative total energy.*"[4] Anderson in 1932 discovered positrons in cosmic radiation. These were regarded as Dirac's negative energy particles. "The first two solutions of the Dirac equation . . . clearly describe a free electron of energy E and momentum **p**. The two negative energy electron solutions . . . are to be associated with the antiparticle, the positron."[5]

However, in the annihilation it is not $(+mc^2) + (-mc^2) = 0$, but $2mc^2$ is the result of annihilation.[6] There is something strange going on with the minus signs in these equations. The calculations are inconsistent.

Maybe there are two kinds of energy considered. One we can call entropy energy E_S. In the annihilation reaction, $\#+mc^2\# + \#-mc^2\# = 2mc^2$. Entropy energy is the higher value. The other energy is order energy E_O. In order energy the same reaction is $(+mc^2) + (-mc^2) = 0$.

Let us consider entropy energy and order energy for particle decay schemes. There are a few decay schemes where no negative order energy (anti-matter) is introduced in the right hand side of the decay schemes. In those few instances, the final order energy is equal to the initial order energy (when kinetic energy is taken into account). But in most cases, a trace of negative order energy (anti-matter) is introduced into the right side of the decay schemes. There is nothing on the left hand sides of the decay schemes to correspond to this addition of a trace of negative order energy on the right sides of the decay schemes. Therefore, total order energy is less on the right hand sides of the decay schemes than on the left hand sides (if only by a trace). A few decay schemes introduce a lot of antimatter (as K^-) on the right side of the decay scheme. The loss of order energy in the systems is greater in those cases. But in every case, for all natural processes, the order energy final is # the order energy initial, or

$$\Delta E_0 \leq 0. \qquad (7\text{-}3)$$

Let us check the order energy for electron electrino fusion reactions. Electrons made energetic by acceleration (as heavy as protons) fuse and form anti-protons. Matter is converted to anti-matter. Entropy energy is conserved, but not so order energy. Order energy is reduced in the extreme from +938 MeV to -938 MeV or more for each electron fused (two electrons are fused in each reaction).

The order-to-disorder arrow for electron electrino fusion points in the usual direction. The system does obey the second law of thermodynamics.

2. Reversing the Order-to-Disorder Arrow. What would happen if we fused the electrino constituents of positrons instead of the electrino constituents of electrons? Entropy energy E_S would again be conserved. Entropy would be increased. However, order energy E_O would go from -2 x 938 MeV to +2 x 938 MeV – from disorder to order. The order-to-disorder arrow would be reversed. This would be a reaction that would be prohibited by the second law of thermodynamics – unless the strong gravitational force that fuses the anti-semions would be stronger than the second law of thermodynamics (which otherwise governs weak interactions). The stronger of the strong gravitational force and the second law of thermodynamics should be determined by experiment. More rides on that one experiment than perhaps on any one other experiment in this generation. If it is found that strong gravity is stronger than the second law of thermodynamics, then order can be restored at first in a small area, and then for the whole earth.

Here we see that the entropy arrow of time and the order-to-disorder arrow of time are separate and distinct, and are not one and the same thing. While all the reactions the author has studied increase entropy, the fusion of positron anti-semions reverses the order-to-disorder arrow, making more order out of the disorder.

Positron constituent electrino fusion might not only take the electrinos from disorder to order. It could make other physical processes in a local area go from disorder to order. The positron fusion not only violates the second law of thermodynamics, it reverses the order-to-disorder arrow of that law in a local area, making other processes in that area reverse. Let us consider that process more to see how it might be regulated.

We guess the desired relationships for reversing the order-to-disorder arrow in the second law of thermodynamics through dimensional analysis. We want to solve for r, the maximum radius in which the reversed law would be effective. There is a way we can obtain a length from combinations of our variables and constants. That way is in the right hand side of Eq. (7-4). The whole expression is the thermodynamic relation we are seeking. The thermodynamic relation is:

$$(\Delta E_o)_t > 0 \ \textit{where} \ r < \frac{(\Delta E_o)_1 \ c}{ik}, \qquad (7\text{-}4)$$

where E_o is the order energy – the positive or negative energy in the pair production of particles; ΔE_o is the change in the order energy, where $(\Delta E_o)_t$ is the change in the total order energy of the system, and where $(\Delta E_o)_1$ is the change in the order energy for a single source reaction – for a positron fusion reaction it is approximately 2 x 10^9 eV/collision x 1.6 x 10^{-19} joules/eV = 3.2 x 10^{-10} joules/collision; c is the speed of light – approximately 3.0 x 10^8 m/s; we shall solve for the effected radius r; i is the beam current in each beam in Coulombs per second (we will solve for 10^{-11}); k is the ratio of particle energy to particle charge. This energy per charge is the accelerated energy of the particle (roughly 1 x 10^9 ev times 1.6 x 10^{-19} joules/ev = 1.6 x 10^{-10} joules) divided by the charge of each positron (q = 1.6 x 10^{-19} coulombs), which equals 10^9 joules per coulomb. The collision efficiency eff is not needed in this equation, because the result is not in particles, but is already in collisions.

Incredibly, the lower the current, the bigger is the radius of the affected area. The greater the current, the smaller is the radius of the effected area. With 10^{-11} A beam currents, the effected

radius r solves for 9.6 meters – roughly 10 meters, which describes a small area – less than a tenth of an acre.

To get an idea of the positron beam currents needed to reverse the order-to-disorder arrow of the second law of thermodynamics in what size of affected radius, see Table 7-1 below.

For an area the size of	r	beam current
House	10 m	10 pA
four football fields	100 m	1 pA
community	1 km	100 fA
city	10 km	10 fA
Israel	160 km	0.6 fA
U.S.	2,400 km	0.04 fA
World	13,000 km	0.008 fA
Sun	1.7E11 m	6E-22 A

Table 7-1. Beam currents versus affected radius for reversal of the order-to-disorder arrow of the second law of thermodynamics.

We must make sure that reversing the second law will do only good and not evil before we flip the switch. Inspired evidences will be studied in the next chapter on a wide range of phenomena affected by reversing the order-to-disorder arrow in the second law of thermodynamics.

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[1]F. Reif, *Statistical Physics*, Berkeley Physics Course--Volume 5 (New York: McGraw-Hill Book Company, 1967), p. 283.

[2]Stephen Hawking, *A Brief History of Time*--From the Big Bang to Black Holes (New York: Bantam Books, 1988), pp. 102, 103.

[3]*Ibid.*, pp. 144, 145.

[4]Robert B. Leighton, *Principles of Modern Physics* (New York: McGraw-Hill Book Company, Inc, 1959), p. 665.

[5]Francis Halzen, Alan D. Martin, *Quarks and Leptons* (New York: John Wiley & Sons, 1984), p. 107.

[6]David S. Saxon, *Elementary Quantum Mechanics* (San Francisco: Holden-Day, 1968), p. 386.

(End of Chapter 7)

EXECUTIVE SUMMARY OF BUSINESS PLAN

electrino energy is a new company formed to develop the inventions envisioned by the new model of physics—the electrino fusion model of elementary particles. Our company provides theoretical work and guidance to licensees. Our focus is the reverser of aging, disease, and decay processes (Refresher 1) and whatever else we must do to fund the Refresher 1.

electrino energy was formed October 12, 2005 as an invention development and theorist service specializing in four high-technology inventions – inertia-less craft; artificial gravities; reverser of aging, disease, and decay processes; and electrino fusion reactors generating electricity. All four inventions have potentially extremely high value. But all four inventions currently have three principle difficulties: 1) they are unbelievable by almost all persons – including agency heads, venture capitalists, congressmen and senators; 2) almost all of them cost scores of millions of dollars to develop; and 3) **electrino energy** has no money to develop them. With no capital and no revenue stream or other assets to fall back on, **electrino energy** cannot even get a guaranteed loan.

But **electrino energy** is not resource-less and in a hopeless condition. It has three principal approaches that it can take to resolve this dilemma:

1) Though the aging reverser is the most urgently needed, a miniature inertia-less craft can be constructed for a whole lot less money. It should be possible to construct one for a few hundred dollars borrowed from friends. But that technology could be licensed for hundreds of millions of dollars – enough to finance all the four high-tech inventions.

2) As a back-up to that approach, venture capital angels could be approached to advance the money to finance the reverser of aging, disease, and decay processes. This invention is not only high tech, but medical. The other inventions could be developed at a later time.

3) As a back-up to that approach, the owner could pursue his particle theory, predicting the masses of particles. That may be difficult, but not impossible. This would do what no other physical theory can do. Such a feat would be publishable, arousing interest among scientists for creating a facility to test the model – opening the way for government funding of the high-tech inventions.

A master decision tree flow chart linking and employing these three alternatives for funding the development of the inventions is in Section 7.0 Financial Plan.

According to alternative 1), projected sales and profits for the first four years of operation are summarized below:

Year	Sales($)	Profits($)	Profit/Sales(%)
1	200,000,000	0	0
2	0	0	0
3	0	0	0
4	10,000,000,000	9,000,000,000	90.0

According to alternative 2), there are no actual projected sales and profits for the first three years of operation. Year four is the same as above. According to alternative 3), there are no projected sales or profits for the first five years.

Currently, there are no competitors for any of these inventions. Once public incredulity is overcome by demonstration, the devices should have huge market potential.

The size of the electricity generating market is essentially enormous. It would be up to 50 percent of electric generation world-wide eventually. That's probably over a trillion dollars.

A self-powered high-speed locomotive powered by an electrino fusion power reactor would need to be at least 85 feet long.

Environmental Heat Engines

Las Vegas inventor Robert Stewart developed his "Stewart Cycle" engine for transportation vehicles, electricity generators, and large-scale water lifters. His efficient and pollution-free engine uses ambient heat to expand a working fluid such as Freon or ammonia and move pistons through sealed chambers. His patent is for Vapor Actuated Power Generating Device, No. 4,033,136.

A possibly more up-to-date version is Ralph J. Lagow's Method of Generating Power from a Vapor, Patent No. 4,693,087. Ken Rauen's Rauen cycle and Superclassical cycle engines also expand working fluids with environmental heat to provide useful net mechanical power.

Mr. Stewart claimed that his fuel-less engine could lift Colorado River water from below Hoover Dam back up into Lake Mead, thereby doubling Hoover Dam's output of electricity. He also proposed lifting water from the Columbia River into the Colorado River via a canal, generating electricity as the water flowed back downhill.

Thank you for your comment, Parke Ewing.

The comment tracking number that has been assigned to your comment is SEDDsupp20018.

Comment Date: December 4, 2011 20:57:10PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20018

First Name: Parke
Middle Initial:
Last Name: Ewing
Organization:
Address: 98 Imperial Hwy. (S-2)
Address 2: PO Box 84
Address 3:
City: Ocotillo
State: CA
Zip: 92259
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

I do not believe that any of our public lands should be developed by any private company for solar projects when renewable electricity can be generated on existing roof tops and private property. Some of these massive proposed projects could be constructed too close to existing homes thereby depleting property values and forcing honest citizens to evacuate their homes due to possible future health issues. BLM stay out of energy issues.

Thank you for your comment, Parke Ewing.

The comment tracking number that has been assigned to your comment is SEDDsupp20019.

Comment Date: December 4, 2011 21:10:33PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20019

First Name: Parke
Middle Initial:
Last Name: Ewing
Organization:
Address: 98 Imperial Hwy. (S-2)
Address 2: PO Box 84
Address 3:
City: Ocotillo
State: CA
Zip: 92259
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Allowing any government agency to regulate private development on public land will certainly open the door for insider trading and investments, along with payoffs to corrupt government employees that could be in a position to sway voting on future projects. Our government should stay out of the energy business and let private industry purchase private property for their energy projects if they so desire. Existing roof top solar gets my vote.

Thank you for your comment, Mark Abeles-Allison.

The comment tracking number that has been assigned to your comment is SEDDsupp20020.

Comment Date: December 11, 2011 07:19:31AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20020

First Name: Mark
Middle Initial:
Last Name: Abeles-Allison
Organization: Bayfield County
Address: 117 E Fifth Street
Address 2:
Address 3:
City: Washburn
State: WI
Zip: 54891
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

I support solar project expansion on government, federal, state and local lands. I also feel strongly that some of these projects should be based in northern climates. Northern climates have the longest summer sunlight when summer AC demand is the highest. Efforts to make less populated northern climates more energy independent with solar electric, will make energy production and distribution in more energy demanding southern climates more efficient.

Thank you for your comment, Richard Ryan.

The comment tracking number that has been assigned to your comment is SEDDsupp20021.

Comment Date: December 13, 2011 00:01:14AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20021

First Name: Richard
Middle Initial: W
Last Name: Ryan
Organization: IV Desert Museum member & Imperial Valley Hike Clu
Address: 1097 Sandalwood Dr.
Address 2:
Address 3:
City: El Centro
State: CA
Zip: 92243
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Imperial Valley CA is now the site of dozens of proposals for the use of public lands (BLM) to build solar and wind farms. Before turning to desert lands in our area, I request the involved federal agencies utilize industrialized areas closer to population centers. Also, federal agencies and private utilities have forgotten about promoting conservation. US consumers are the most wasteful users of energy in the world, but I hear little from the federal government and utilities encouraging conservation. Instead the emphasis is on expanding production without making consumption wiser. The institutions of which I am a member submit that the current formula should be inverted. Make consumption smarter and reduce the need to build alternative energy plants on desert lands. US government thinking is only green wash as long as conservation and avoiding waste is ignored. Regards, Richard W. Ryan

Thank you for your comment, Ricki Brodie.

The comment tracking number that has been assigned to your comment is SEDDsupp20022.

Comment Date: December 13, 2011 22:25:05PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20022

First Name: Ricki
Middle Initial:
Last Name: Brodie
Organization:
Address: 40591 Pebble Beach Circle
Address 2:
Address 3:
City: Palm Desert
State: CA
Zip: 92211
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

December 13, 2011

Statement of Ms. Ricki Brodie
40591 Pebble Beach Circle
Palm Desert, CA 92211
760-834-9139 www.wom4444@yahoo.com

Dear Sirs:

We residents of Riverside County are proud of all we have done to make the solar industry welcome here. The solar industry gives us a big edge in terms of Riverside County being seen as a progressive, future-looking county.

The Riverside County Board of Supervisors has approved a comprehensive solar power plant policy requiring large-scale solar developers to pay a $450 per-acre payment to compensate the county for the use of its property and for committing immense tracts of land exclusively to solar development.
More than 20 projects are currently planned for the County, covering an approximately 118,000 acres in eastern Riverside County. The projects are expected to deeply change the look of the desert, eliminating all other potential uses. A great many acres of land are needed to help a society transitioning from fossil fuels to renewable fuels.
We residents of Riverside County have done as much as possible to enable the solar industry to begin work here as soon as possible. The Board of Supervisors is even giving a 10% reduction in fees for projects begun before December 2014.
But, Riverside County has responsibilities to others beside the solar industry. We also have responsibilities to residents and to those who live in this county because they love the desert. There are side effects to our commitment to solar power. Desert landscape will be scarred forever. Wildlife habitat will be destroyed.
It is apparent to me that Riverside has given its all to the solar industry. The acreage that is going to the industry is extremely generous. However, BLM has left a door open for further land use for solar because of the variance process. Due to wildlife and resource conflicts all areas left in the BLM zones should be deemed unsuitable for development.
Riverside County still deserves and needs unspoiled desert. And the citizens of our county cannot lose anymore of our precious heritage. We have done more than our share to establish solar power in the desert – now our wildlife and desert habitat must be protected!

Thank you for your comment

The comment tracking number that has been assigned to your comment is SEDDsupp20023.

Comment Date: December 19, 2011 15:59:27PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20023

First Name: [Withheld by requestor]
Middle Initial:
Last Name: [Withheld by requestor]
Organization:
Address:
Address 2:
Address 3:
City:
State:
Zip:
Country:
Privacy Preference: Withhold name and address from public record
Attachment:

Comment Submitted:

It is very premature to consider putting significant energy sources in remote natural areas.
1) We have enough parking lots and rooftops in urban/suburban areas to provide PV/solar electricity near the point of use.
2) Siting energy sources so far from point-of-use results in dramatic energy losses in transmission; commonly less than one-half the generated power gets to the point of use.
3) We should collect data from already permitted sites for some years before approving more natural area coverage.
4) Just because we "can" doesn't mean we "should".

Thank you for your comment, Katherine Michalak.

The comment tracking number that has been assigned to your comment is SEDDsupp20024.

Comment Date: January 13, 2012 13:44:47PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20024

First Name: Katherine
Middle Initial:
Last Name: Michalak
Organization:
Address: PO Box 604
Address 2: 363 E Copper Ave
Address 3:
City: Crestone
State: CO
Zip: 81131
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Solar SPEIS comment, Katherine Michalak.doc

Comment Submitted:

To Whom It May Concern,

I am a citizen of Saguache County, and I attended the BLM Solar SPEIS public meeting in Alamosa on January 11. After hearing the BLM presentation and public comments, my views are as follows:

It seems clear that the valley will be seeing substantial solar development in the near future, and I support this. However, I feel that how this development is structured economically is of crucial concern. I believe that, if public lands are going to be developed, they should be developed in a way that supports the local economy in a long term way.

The current BLM proposal does not look like it will provide meaningful local economic benefit; only meaningful non-local profit. I would like to know whether the BLM is required to prioritize federal over state economic concerns, or federal political concerns over economic concerns.

If the BLM does have a legal obligation not to prioritize local economies, then I don't see how the SPEIS can be modified in a way that will adequately address the needs of the San Luis Valley.

However, if the BLM does not have such a legal obligation, then I feel that they have a duty to continue altering their proposal until it's structured such that the use of the public lands in question is primarily of economic benefit to the regional public, not to non-local enterprises.

This could mean opening the lands to projects under 20 megawatts and providing incentives that would favor local businesses over remotely-owned large scale projects. It could also mean imposing heavy taxation on industrial projects which would have to be paid to local economies.

Thank you for evaluating public concerns and responding ethically.

Regards,

Katherine Michalak

Katherine Michalak
PO Box 604
Crestone, CO 81131
719-588-0420
kmichalak@myfastmail.com

Solar Energy Draft PEIS
Argonne National laboratory
9700 S Cass Ave, EVS/240
Argonne, IL 60439

January 13, 2012

To Whom It May Concern,

I am a citizen of Saguache County, and I attended the BLM Solar SPEIS public meeting in Alamosa on January 11. After hearing the BLM presentation and public comments, my views are as follows:

It seems clear that the valley will be seeing substantial solar development in the near future, and I support this. However, I feel that *how* this development is structured economically is of crucial concern. I believe that, if public lands are going to be developed, they should be developed in a way that supports the local economy in a long term way.

The current BLM proposal *does not* look like it will provide meaningful local economic benefit; only meaningful non-local profit. I would like to know whether the BLM is required to prioritize federal over state economic concerns, or federal political concerns over economic concerns.

If the BLM does have a legal obligation not to prioritize local economies, then I don't see how the SPEIS can be modified in a way that will adequately address the needs of the San Luis Valley.

However, if the BLM does *not* have such a legal obligation, then I feel that they have a duty to continue altering their proposal until it's structured such that the use of the public lands in question is primarily of economic benefit to the regional public, not to non-local enterprises.

This could mean opening the lands to projects under 20 megawatts and providing incentives that would favor local businesses over remotely-owned large scale projects. It could also mean imposing heavy taxation on industrial projects which would have to be paid to local economies.

Thank you for evaluating public concerns and responding ethically.

Regards,

Katherine Michalak

Thank you for your comment, Philip Incao.

The comment tracking number that has been assigned to your comment is SEDDsupp20025.

Comment Date: January 13, 2012 13:52:56PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20025

First Name: Philip
Middle Initial:
Last Name: Incao
Organization:
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Address 3:
City: Crestone
State: CO
Zip: 81131
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Dear BLM Representative:
We, the concerned residents of the San Luis Valley strongly reject the plan to open more than 100,000 acres of public lands in the San Luis Valley (SLV) to massive corporate, industrial solar development. I believe this type of export dependent economic "development" model is inappropriate to the needs of the SLV and to the 21st Century. This type of industrial solar development is likely to absorb limited financial resources, monopolize existing transmission capacity, saturate markets and create a path dependency that leaves little room for local energy-based economic development.
Many of us in the SLV are looking towards a different kind of future, one in which there will be locally owned installations which will create real energy independence that renews our communities from the ground up. Rather than empowering large corporations, this type of development will empower communities and local economy. Locally owned, clean energy is the path to true energy independence and lasting prosperity that benefits real people and communities.
Conservation and distributed generation is a much more sensible approach. Massive distributed solar generation in our vast urban landscapes makes far more sense than bulldozing our valuable public lands. Furthermore solar electrons need to be consumed at the closest point of demand making distributed solar a much more sensible and ecological approach to energy generation.
Sincerely,
Philip Incao, MD

Thank you for your comment, Barbara Tidd.

The comment tracking number that has been assigned to your comment is SEDDsupp20026.

Comment Date: January 13, 2012 21:51:03PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20026

First Name: Barbara
Middle Initial:
Last Name: Tidd
Organization:
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City: Moffat
State: CO
Zip: 81143
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Orient Land Trust (1 mi. from my home) has been off-grid since its inception in 2001 and Valley View Hot Springs, its predecessor, has been off-grid since before the Native Americans arrived there. Orient Land Trust is a major tourist attraction and employer in the Valley and has over 25,000 visitor days per year AND is OFF-GRID using hydroelectric power.
The Town of Del Norte recently celebrated the completion of its 1.9 MW Net-Zero Solar network.
The Mesita/Conejos County canola/biodiesel plant has plans to expand production to serve more of the Valley. The 300 kW Humprey's microhydro generation plant made a big splash last fall when it went into the operation. The City of Alamosa, Alamosa, Del Norte, Costilla and Crestone District Schools, Adams State College, SLV Regional Medical Center and SLV Federal Bank have all gone solar.
Dozens of pioneering SLV farmers have installed solar PV panels to power irrigation pumps and efforts are moving forward with plans to develop up to 2,500 MW of solar generation on crop circle pivot corners without adversely impacting valuable agricultural lands.
Hundreds (perhaps as many as 1,000) homeowners have installed solar PV on their rooftops since the 1970's. These locally owned installations create real energy independence that renews our communities from the ground up.
Some people think the San Luis Valley can have both local and industrial solar development, but the evidence from renewable energy experts suggests otherwise. Industrial solar is more likely to absorb limited financial resources, monopolize existing transmission capacity, saturate markets and create a path of dependency that leaves little room for local energy-based economic development.
Our family home built in 2008 is off-grid because it is 2.5 mi. from the nearest electricity hook-up. We enjoy and feel more secure being energy independent and producing our own electricity. Local, community-owned, distributed solar generation is what I would like to see more of here in the Valley. It would create at least as many if not more jobs than the large industrial scale projects like what are being proposed for BLM land. Distributed solar generation creates jobs for installing solar panels at the point of use –no need for additional transmission lines and electricity produced would stay here in the Valley.

Thank you for your comment, Deborah Michalak.

The comment tracking number that has been assigned to your comment is SEDDsupp20027.

Comment Date: January 13, 2012 22:42:07PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20027

First Name: Deborah
Middle Initial:
Last Name: Michalak
Organization:
Address: PO Box 604
Address 2: 363 E Copper Ave
Address 3:
City: Crestone
State: CO
Zip: 81131
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Hello,

Although I was not able to be at the BLM public meeting on the 11th, my two daughters were there, and they summarized the information in the meeting for me. My daughter Katherine just wrote a thoughtful letter, and instead of paraphrasing her words, I would like to copy sections of her letter below as statements of how I, too, feel about the SPEIS:

I believe that, if public lands are going to be developed, they should be developed in a way that supports the local economy in a long term way.

The current BLM proposal does not look like it will provide meaningful local economic benefit; only meaningful non-local profit. I would like to know whether the BLM is required to prioritize federal over state economic concerns, or federal political concerns over economic concerns.

If the BLM does not have such a legal obligation, then I feel that they have a duty to continue altering their proposal until it's structured such that the use of the public lands in question is primarily of economic benefit to the regional public, not to non-local enterprises.

From what my daughter has told me, it seems like the BLM is making a big effort to take public concerns seriously, and I appreciate this. Please continue to respond to comments by changing your proposal accordingly.

Sincerely,

Deborah Michalak

Thank you for your comment, Jared Fuller.

The comment tracking number that has been assigned to your comment is SEDDsupp20028.

Comment Date: January 16, 2012 18:35:34PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20028

First Name: Jared
Middle Initial: G
Last Name: Fuller
Organization:
Address: 636 W. 200 S.
Address 2:
Address 3:
City: Provo
State: UT
Zip: 84601
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

The solar energy zones proposed in the current draft of the PEIS should not be expanded and no new SEZs established in the final version. The vast majority of lands under BLM administration contain various resources that should be conserved. These include biological resources such as vegetation and wildlife in nearly all locations, as well as possible rare plant and animal species. Many areas contain cultural and archaeological resources that should not be disturbed. Visual and recreational resources in many areas are also of value. Because of impacts to these and other resources, the boundaries of the larger SEZs such as the Riverside East, Afton, Dry Lake Valley North, Millers and possibly others should be further contracted.

Thank you for your comment, Joseph Michalak.

The comment tracking number that has been assigned to your comment is SEDDsupp20029.

Comment Date: January 16, 2012 20:00:03PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20029

First Name: Joseph
Middle Initial:
Last Name: Michalak
Organization:
Address: Post Office Box 32283
Address 2:
Address 3:
City: Santa Fe
State: NM
Zip: 87594
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

January 16, 2012

Regarding the BLM 6-state solar proposal:

I understand that submitting comments is a form of voting on the supplement and therefore potentially influencing the next step of the project. I live in Santa Fe, New Mexico and have previously lived in Crestone, Colorado; based on my understanding of the economics and environmental resources of these two states, my perspectives are as follows:

Solar development on public lands makes sense, provided the following criteria are met:

Limitations in the final proposal are specific enough that project approvals outside of priority zones only happen as exceptions —including in the long term, not just in the short term. That is, the BLM final has a responsibility to insure that environmental resources will be impacted minimally not just initially, but into the foreseeable future.

Local and regional economies benefit substantially and in an ongoing way from all solar projects

The application process is opened to projects of less than 20 megawatts and incentives given to small projects that demonstrate the capability of providing a higher percentage of sustained economic benefit to local economies per megawatt than competing industrial projects.

Thank you for evaluating my feedback.

With best regards,

Joseph Michalak
505-699-0326

Thank you for your comment, Michael Brown.

The comment tracking number that has been assigned to your comment is SEDDsupp20030.

Comment Date: January 17, 2012 13:40:49PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20030

First Name: Michael
Middle Initial:
Last Name: Brown
Organization:
Address:
Address 2:
Address 3:
City:
State: CO
Zip: 81201
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

The emergence of solar is going to rely heavily on natural gas peaking plants. Battery backup systems will struggle to come in under 2 Dollars per MWh. Ultimately, battery storage is going to need to be incorporated into solar power plants. Battery storage as a stand-alone business entity cannot economically absorb the efficiency losses.

There's a real minute-to-minute cost to the grid when it comes to handling lots of solar power on partly cloudy days. Out in the Nevada desert, it adds up to about $3 to $8 per megawatt-hour.

Those are the numbers churned out of a Department of Energy-backed project with Las Vegas-area utility NV Energy based on a computer model simulating 10 different scenarios for solar PV systems at both rooftop and utility scales. Turns out that 150 to 1,000 megawatts of intermittent PV penetration requires a lot of fossil fuel-fired backup generators to help smooth it out on cloudy days and that costs utilities money.

Take a snapshot of two days' worth of minute-by-minute simulation of weather patterns and insolation using data from 2007, which is NV Energy's record peak year of power use.The sunny days are a smooth, easy-to-predict rise and fall, allowing supporting natural gas-fired plants ramp up and down slowly and smoothly, saving on wear and tear and burning fuel at top efficiency.

But add scattered, partial clouds to the mix, and the picture grows jagged and unpredictable, with jumps of tens of megawatts for smaller-scale penetration, and hundreds of megawatts in minutes for scenarios of 300 megawatts or more. NV Energy can handle that today, it won't break the grid, in other words, but it will cost the utility extra in fuel burn and cause earlier and more frequent turbine maintainence by forcing them to ramp and cut back so hard and so often. Think of it as driving at a smooth speed on the freeway, versus driving in stop-and-go traffic that suddenly speeds up to 60 MPH all at once.

You can see why utilities haven't tried to build that much solar and wind under their own power, it costs them extra. That's why it's taken government mandates to push them into signing up existing and future wind, solar and other renewable power sources in multi-year contracts, or to implement policies that make it easier and more profitable for their customers to install it on their own.

This isn't exactly news, of course, and it would be surprising if utilities and big solar and wind developers weren't arguing over numbers like these in their PPA contract negotiations on a daily basis. Still, it's interesting to see some real dollar figures emerge.

Still, not every utility service area looks like Las Vegas, which has access to a massively wasteful use of cheap power and from the Hoover Dam. But certainly states with big renewable portfolio mandates will have utilities worried about backing up all their intermittent solar and wind power.

Interestingly, the study didn't look at hydropower to balance PV, even though the country's biggest dams lie in NV Energy's territory. It also didn't look at energy storage, though the $3 to $5 per megawatt-hour figure may offer some guidance on what utilities will be willing to pay for storage systems that can reliably balance big PV.

Wind farms have hundreds of megawatts of battery-based storage installed and on the way in Japan, the U.S. and around the world, but it's almost always cheaper to use natural gas-fired peaker plants or pumped hydro.

Overall, NV Energy would need to keep about 1 megawatt of generating capacity online for regulation for every 25 megawatts of PV, the study found, and it would have to be fast, with 1 megawatt-per-minute in ramping capacity for each 75 megawatts of solar.

So with all the whining about 'fracking' and natural gas, we should seriously look at the New Westinghouse Electric Company industry standard AP1000® reactor. Historically, Westinghouse plant designs and technology have forged the cutting edge of worldwide nuclear technology. Today, about 50 percent of the world's 440 nuclear plants are based on Westinghouse technology.

The AP1000 is the safest and most economical nuclear power plant available in the worldwide commercial marketplace, and is the only Generation III+ reactor to receive Design Certification from the U.S. Nuclear Regulatory Commission (NRC).

The AP1000 features proven technology, innovative passive safety systems and offers:
•Unequaled safety
•Economic competitiveness
•Improved and more efficient operations

The AP1000 builds and improves upon the established technology of major components used in current Westinghouse-designed plants with proven, reliable operating experience over the past 50 years. These components include:
•Steam generators
•Digital instrumentation and controls
•Fuel
•Pressurizers
•Reactor vessels

Simplification was a major design objective for the AP1000. The simplified plant design includes overall safety systems, normal operating systems, the control room, construction techniques, and instrumentation and control systems. The result is a plant that is easier and less expensive to build, operate and maintain.

The AP1000 design saves money and time with an accelerated construction time period of approximately 36 months, from the pouring of first concrete to the loading of fuel.

Thank you for your comment, Lee Bice.

The comment tracking number that has been assigned to your comment is SEDDsupp20031.

Comment Date: January 18, 2012 14:46:53PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20031

First Name: Lee
Middle Initial:
Last Name: Bice
Organization: Clark County Desert Conservation Program
Address: 333 N Rancho Dr., Ste 625
Address 2:
Address 3:
City: Las Vegas
State: NV
Zip: 89106
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: 20120118 Scoping Comments Argonne Natl Lab LB.pdf

Comment Submitted:

desert conservation
PROGRAM

January 18, 2012

Supplement to the Draft Solar Programmatic Environmental Impact Statement
Argonne National Laboratory
9700 S. Cass Avenue – EVS/240
Argonne, Illinois 60439
http://solareis.anl.gov/involve/index.cfm

Re: Scoping Comments on the Supplement to the Draft Solar Programmatic Environmental Impact Statement

To Whom It May Concern:

Thank you for the opportunity to provide comments on the Supplement to the Draft Solar Programmatic Environmental Impact Statement (DPEIS).

Clark County, Nevada, through the Desert Conservation Program (DCP), administers the Clark County Multiple Species Habitat Conservation Plan (MSHCP) and Section 10(a)(1)(B) incidental take permit (TE034927-0) for compliance with the Federal Endangered Species Act on behalf of the County and the cities of Boulder City, Henderson, Las Vegas, Mesquite and North Las Vegas; and the Nevada Department of Transportation (Permittees). The current permit covers 78 species, including the threatened desert tortoise.

BLM Alternatives Comments:

On page 2-35, lines 34 and 35 and on Figure 2.2-2, please define clearly what the Proposed Desert Tortoise Connectivity Areas are and how they were constructed. Please cite agency personnel or technical documents and provide a list of GIS inputs that were used for this analysis.

On page 2-57 and 2-58 within Table 2.3-2, under Modified Program Alternative column, it states that the following species' habitats overlap by the percentage shown:

Plants:

- White-margined beardtongue – less than 8%
- Desert Tortoise – less than 12%
- Western burrowing owl – less than 8%
- Western willow flycatcher – less than 1%

Clark County recommends that for the final PEIS the following potential habitat models should be used for analysis within Clark County:

- Desert Tortoise and Burrowing Owl Models are available from the USGS Western Ecological Research Center, http://www.werc.usgs.gov/.
- Rare plant models for Las Vegas buckwheat, Las Vegas bearpoppy, Threecorner milkvetch, Pahrump Valley buckwheat, Sticky buckwheat, Beaver Dam breadroot, White-margined beardtongue, White bearpoppy, and Two-tone beardtongue are available from Fred Edwards, BLM Las Vegas Field Office.
- Southwestern Willow Flycatcher model is available from Elisabeth Ammon, Great Basin Bird Observatory, http://www.gbbo.org/index.html.

Appendix C Comments:

On page C-167, Figure C.4.2-1, change Las Vegas Colony to Las Vegas Paiute Indian Reservation and remove boxes with 8201, 8209, and 8215, these appear to be partial zip codes.

On page C-169, lines 31-33, The USFWS identified the entire Dry Lake SEZ as an area of concern for the desert tortoise recovery. What does that mean? Can USFWS provide a map of concerned areas? In the USFWS 2011 Revised Recovery Plan for the Mojave Population of the Desert Tortoise no mention of areas of concern were found.

On page C-170, Figure C.4.2-2, the Developable area (5,717 acres) boundary includes the Nevada Energy's Harry Allen Generating Station (≈300 acres). The generating station footprint should be removed from the Developable area and identified as "Non-development." The Dry Lake map (with panorama icons) should be updated in the PEIS website under Solar Energy Zones>Dry Lake too.

We appreciate the opportunity to provide comments to the DPEIS. Should you have any questions, please don't hesitate to contact me at 702-455-3554.

With my regards,

Lee Bice
Sr. GIS Analyst

LB/ee

Thank you for your comment, Connie Simkins.

The comment tracking number that has been assigned to your comment is SEDDsupp20032.

Comment Date: January 20, 2012 07:57:28AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20032

First Name: Connie
Middle Initial:
Last Name: Simkins
Organization: Lincoln County Commission
Address:
Address 2:
Address 3:
City:
State: NV
Zip:
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Final Solar SPEIS comments 1-17-12.pdf

Comment Submitted:

EIS Section	Page/Line	Comment/Suggested Revision
	General to "Additional Locally Relevant Screening Criteria"	important steps in the process, and the current language in this section is not strong enough to ensure adequate local input. Please refer to the following comments for suggestions on improving this step of the process.
D.3.3	Page D-5 / Line 32	This section currently reads, "State and field offices undertaking efforts to identify or expand SEZs ***may*** choose to identify and apply additional screening criteria based on local conditions and institutional knowledge in consultation with other local, State and federal authorities and Tribes." The "may" should be changed to "shall". Coordination with the listed stakeholders is absolutely imperative to developing an SEZ that is feasible and supported by the local community. Additional criteria should be added to require the State and/or field office to determine the general level of support or opposition of the SEZ by the local and state government, and part of the screening criteria should be determining if a project in the area could obtain all necessary local and state permits. This needs to be identified early in the process to avoid wasting time, money and resources. A pre-NEPA scoping meeting (similar to the proposed pre-applications meetings in the Variance Process) should also be held in the local community where the new or altered SEZ is to be located, in an effort to gain all possible "institutional knowledge". This also encourages early community engagement and buy-in as part of the process.
D.3.3	Page D-5 / Line 43-46	This sentence should include "potential interference with existing authorized land uses". This is a key item to analyze since solar development alters public land use from multiple use management to sole use.
D.4.1	General Comments Regarding "Identification of Disturbed Sites"	Lincoln County supports the identification of disturbed sites for SEZs and solar development in general. This limits the disturbance of fragile desert ecosystems. That being said, areas that have burned and crossed an ecological threshold due to invasion of noxious or invasive weeds should be considered "disturbed sites".

Thank you for your comment

The comment tracking number that has been assigned to your comment is SEDDsupp20033.

Comment Date: January 20, 2012 20:09:05PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20033

First Name: [Withheld by requestor]
Middle Initial:
Last Name: [Withheld by requestor]
Organization:
Address: [Withheld by requestor]
Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold name and address from public record
Attachment:

Comment Submitted:

Vote no on opening BLM land in the San Luis Valley to large-scale corporate development! I am in favor of keeping local control and profits of solar development.

Thank you for your comment, Jared Fuller.

The comment tracking number that has been assigned to your comment is SEDDsupp20034.

Comment Date: January 21, 2012 14:44:39PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20034

First Name: Jared
Middle Initial: G
Last Name: Fuller
Organization:
Address: [Withheld by requestor]
Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold address from public record
Attachment:

Comment Submitted:

I strongly support the drafting of rules guiding development of solar energy on public lands which minimize or eliminate impacts to wildlife and ecosystems. In the final version of the PEIS, these rules should be extended to all solar energy applications on public lands, not just those filed after October 28, 2011. The proposal to allow additional projects outside the SEZs (the 'Variance Process') could undermine the conservation intent of the entire solar energy program if development is not limited to places with low environmental value such as previously disturbed locations. Any proposals that may proceed under the Variance Process should meet strict environmental criteria, if allowed to proceed at all.

I also commend the BLM for excluding fragile and ecologically important areas from solar development in response to environmental concerns ('Exclusion Areas'). Please expand the Exclusion Areas to include environmentally sensitive areas important to the survival of wildlife and plant species such as: wildlife habitat management areas, desert tortoise habitat and connectivity areas, areas that contain rare plants, areas with a high concentration of succulents, and the entire Ivanpah Valley in both Nevada and California.

Jared Fuller
Provo, UT

Thank you for your comment, Vikki Bauer.

The comment tracking number that has been assigned to your comment is SEDDsupp20035.

Comment Date: January 22, 2012 13:29:52PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20035

First Name: Vikki
Middle Initial: m
Last Name: Bauer
Organization: Mono County
Address: Board of Supervisors
Address 2:
Address 3:
City: Bridgeport
State: CA
Zip: 93517
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: PEIS letter.docx

Comment Submitted:

Bureau of Land Management
Attn.: Shannon Stewart
Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue—EVS/240
Argonne, IL 60439

Dear Ms. Stewart,

I am writing to provide comments on the Supplement to the Draft Solar Energy Programmatic Environmental Impact Statement.

The long-term plan for solar energy development now being considered, the Supplement to the Draft Solar Programmatic Environmental Impact Statement (PEIS), will help shape future energy development and land use across the public lands of the west.

I applaud the BLM in responding to recommendations from the public to focus development in pre-screened, low-conflict zones. Overall, the Supplement is a step in the right direction, and most of the elements should be carried through the final plan. However, I believe the plan should provide additional incentives for building projects in low conflict zones and avoid development on public lands that are important for wildlife, recreation, tourism and other uses by County residents and visitors.

To ensure that solar development on public lands is smart from the start, I support most of the plan as laid out in the revised Preferred Alternative. I recommend that:

- The BLM should ensure that these large solar projects are built primarily in the pre-screened, low-conflict zones;
- The BLM should ensure that counties have a major role in designating future solar energy zones; and
- The BLM should provide a 60 day comment period on the final plan to allow public response to additional information in the final plan.

By focusing on low-conflict zones, the BLM can ensure that solar development avoids the conflicts and controversy that have plagued oil and gas development on public lands throughout the rural west. I urge you to take this common-sense approach that will allow solar development that is faster, cheaper and better for the environment, consumers and our western counties.

Thank you for considering my concerns.

Sincerely,

Vikki Magee Bauer
Mono County Board of Supervisors, District 3
vbauer@mono.ca.gov

Thank you for your comment

The comment tracking number that has been assigned to your comment is SEDDsupp20036.

Comment Date: January 22, 2012 21:34:23PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20036

First Name: [Withheld by requestor]
Middle Initial: [Withheld by requestor]
Last Name: [Withheld by requestor]
Organization:
Address: [Withheld by requestor]
Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold name and address from public record
Attachment:

Comment Submitted:

Solar energy exclusion areas in the final PEIS should be expanded to include lands considered for protection under the California Desert Protection Act of 2011. These include proposed national monuments, expansions of national parks and preserves, and wilderness areas. Current or future applications in these areas which may be considered under the 'variance process' should also be excluded. These environmentally sensitive areas have resources determined worthy of protection. In the very least, they should be reserved from development until a legislative decision is made regarding their protection.

Jared Fuller
Provo, UT

Thank you for your comment, Jeff Pauly.

The comment tracking number that has been assigned to your comment is SEDDsupp20037.

Comment Date: January 23, 2012 11:45:48AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20037

First Name: Jeff
Middle Initial: M
Last Name: Pauly
Organization:
Address: 30 Locust Drive
Address 2:
Address 3:
City: Yerington
State: NV
Zip: 89447
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

My concern regards the area under consideration near Goldpoint Nv. It appears the agency is disregarding how this area will affect the local residents. It also appears our concerns are disregarded, and your plan will go on no matter what the public says. I am not opposed to solar power, but other areas more remote need to be considered. There is also the issue of water for this project and by your own study this area will not provide enough water to run the system. So again I voice my opposition to this one area under consideration and will continue to let my representatives in congress know, and seek the answers from the BLM that we continue to have unanswered and ignored.

Thank you for your comment, Jeff van Ee.

The comment tracking number that has been assigned to your comment is SEDDsupp20038.

Comment Date: January 23, 2012 11:47:34AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20038

First Name: Jeff
Middle Initial:
Last Name: van Ee
Organization: Nevada Outdoor Recreation Association
Address: P.O. Box 70631
Address 2:
Address 3:
City: Las Vegas
State: NV
Zip: 891700631
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: solarpeis.pdf

Comment Submitted:

As the director of the Nevada Outdoor Recreation Association (NORA), I am submitting the following comments on the Draft Solar PEIS. I attended the public meeting in Las Vegas, but did not provide comments at that time.

The Draft Solar PEIS is a step in the right direction. I have advocated for a regional screening of public lands in the West for renewable energy projects to avoid unnecessary delays in the siting and construction of badly needed renewable energy power sources and to minimize adverse environmental impacts. Consideration of energy projects on a case-by-case basis can lead to a degradation of the West that will not be fully appreciated until some time has passed, a number of energy projects have been built, and the cumulative impact on the West has been recognized. Industrialization of large, remote areas of the West is occurring, and we must be careful in avoiding unintended consequences. The joint Department of Energy and Bureau of Land Management efforts to develop the draft and supplement are commendable. Efforts to involve a broad cross-section of interested parties is not only important to ensure compliance with the legal provisions of the National Environmental Policy Act, but it is important to ensure that our path towards energy independence and reduction of green-house gases is as straightforward as possible. It is important to get it right.

Unfortunately, there are some serious flaws to the framework that has been established. The scope of the analysis of impacts from large-scale energy development on lands in the West is too limited. The present analysis is confined to large-scale solar development on BLM lands in the Southwest. We know that energy usage and development occurs over even larger areas. State boundaries, marketplaces, and transmission networks are some other boundaries to consider for decision-making analysis. For example, natural gas in Wyoming is presently transported to the Southwest by pipleline, and wind energy projects are being considered in Wyoming for markets in the Southwest. To focus solely on states in the Southwest for evaluation of solar-energy projects in the West is a mistake. To focus solely on large-scale solar energy projects in the Southwest and ignore other large-scale energy projects, such as wind and oil and gas exploration, is also a mistake.

The proactive analysis and prioritization of solar energy zones in the Southwest should be expanded to include other large-scale, landscape changing projects. Whether it is wind, oil and gas, or mining, significant landscape-scale changes are rapidly changing the West and potentially impacting wildlife and humans in ways that may not be understood until it is too late.

This EIS, while it may seem already to be big in scope, is part of a bigger picture. It is part of a national energy policy. From comments that have already been made, it is clear that many people understand this. Many organizations and groups are calling for energy efficiency and locating renewable energy facilities nearer load centers to reduce impacts on rural areas of the West. The NORA encourages this. This EIS needs to encourage this, and it needs to lay the groundwork for how large-scale renewable energy projects in remote areas of the West will affect efforts to meet our energy needs in urban areas through energy efficiency and distributed power systems in the urban areas.

The costs of developing large-scale solar and other renewable energy projects in remote areas of

the West need to be thoroughly assessed. The cost of the transmission lines, roads, water, and other infrastructure, together with the environmental impacts and costs, may lead these type of developments to be less advantageous than believed. Distributed, smaller-scale projects within and near urban load centers might be better than believed despite the perceived troubles in getting smaller-scale projects to add up. From a security and reliability stand-point, small-scale distributed systems are worth pursuing before we encourage a land-rush on rural public lands for large-scale renewable developments. Energy efficiency improvements are likely to be less costly than large-scale solar even when large-scale solar is slated for BLM lands.

Earlier comments have encouraged large-scale solar projects be prioritized towards Brownfields and other disturbed lands. There are other areas that have been excluded from this large-scale assessment of potential solar energy zones in the West. For example, native American reservations may be quite willing and eager to see some of these projects on their lands. When you include all of the areas in the West that may be priority candidates for the siting of large-scale solar and other energy developments, the acreage and potential power generated could be quite significant.

How can this EIS be improved without sacrificing the considerable time and effort that has already been made? I would suggest a tiered approach with references. Show how efforts to develop other energy projects in other areas of the West relate. In the end, market forces and demand requirements will dictate to what extent new, energy projects are developed. Government policies also have a significant effect on our energy choices and our future energy sources. Increased emphasis on energy efficiency, and an increased focus on quantification of the costs and benefits of energy efficiency improvements is probably the best, short-term solution for our energy dilemma. While this topic may seem to be outside the original scope of this EIS effort, I would argue that increased energy efficiency, as well as the direct and indirect costs of other energy sources, will have an impact on the extent that the defined SEZ's are utilized and potential variances from those SEZ's are sought. This programmatic EIS should be placed in context with a national energy policy and other efforts to supply energy to the West and to the Nation. Thus, far it falls short in this regard. The good work that has already occurred should not be disregarded. The good work should serve as a foundation for a bigger look at the bigger problem. How can we meet our energy needs with the least environmental impact, at the lowest cost considering those impacts, in the most efficient manner? How can we avoid future train wrecks?

The partnership in developing this EIS between the Department of Interior and the Department of Energy is a good one with a lot of potential.

Thank you for your comment, Gary Vesperman.

The comment tracking number that has been assigned to your comment is SEDDsupp20039.

Comment Date: January 23, 2012 12:53:56PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20039

First Name: Gary
Middle Initial: C
Last Name: Vesperman
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Address: 588 Lake Huron Lane
Address 2:
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City: Boulder City
State: NV
Zip: 890051018
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Seven clean energy inventions.docx

Comment Submitted:

There is no need to spoil thousands of acres of pristine wild lands with wind turbines nor solar energy collectors. The U.S. Government and the American economy ought to instead develop new energy inventions such as the seven clean energy inventions described in the attached Word document. Numerous other energy inventions are also described or at least leasted in my website www.padrak.com/vesperman.

Seven Clean Energy Inventions

Compiled by Gary Vesperman, 588 Lake Huron Lane, Boulder City, NV 89005-1018 702-435-7947
garyvesperman@yahoo.com www.padrak.com/vesperman

Hydro-Magnetic Dynamo

A doughnut-shaped Hydro-Magnetic Dynamo as big as a two-car garage could safely and reliably generate 1000 megawatts minus its 10-megawatt sustaining input power for 25 years or more with no fuel, no pollution, and minimal maintenance.

From 1992 to 1997 in Armenia the third prototype hydro-magnetic dynamo continuously generated a constant current of 6,800 amperes at 220 volts DC – 1.49 megawatts. Its toroid weighed 900 kilograms and had a diameter of 2 meters.

Water flow through the toroid enables the hydro-magnetic dynamo to function as an over-unity electrostatic transformer. Electromotive force is induced by windings around the toroid.

The hydro-magnetic dynamo's production cost is estimated at $500 per kilowatt. The hydro-magnetic dynamo’s electricity would be priced .1 cent per kilowatt-hour. Capacities can range from 100 kilowatts to 1000 megawatts. Seven 1000-megawatt hydro-magnetic dynamos can be vertically stacked to combine into a single 7000-megawatt fuel-less hydro-magnetic dynamo.

For comparison, Hoover Dam’s 17 generators have a total nameplate capacity of 2080 megawatts.

Inventor: Oleg V. Gritskevitch, Vladivostok, Russia
rexresearch.com/gritskevich/gritskevich.htm
padrak.com/vesperman “Locomotive Power Sources”
Russian Patent WO 011505A1

Electrino Fusion Power Reactor

The electrino fusion power reactor is a safe pollution-free generator of 1880 megawatts, net, of DC electricity. A linear accelerator (jpaw.com) collides two beams of electrons at 940 million electron volts. The electrino fusion power reactor's size would be 80’ x 10’ x 10’. 150 lbs of brass would be consumed over 100 years before shutdown for accelerator rebuilding. Super novas and η‘(938) decay confirm electrino fusion theory.

The energy released in annihilation photons would be 3760 megawatts. "Annihilation photons" are the 940 MeV X-rays produced when a negatron annihilates a proton. These X-rays are converted to electricity by order-to-disorder arrow-reversed photo-voltaic cells with nearly 100% efficiency. To sustain the electrino fusion reaction, 1880 megawatts would be taken from the 3760 megawatts output to power the folded linear accelerator, its eight 35 to 50-megawatt pulsed klystrons, magnets, power supplies, controls, etc.

The first 1880-megawatt electrino fusion power reactor may cost $120 million. Subsequent electrino fusion power reactors would cost $50 million. The price of its electricity would be a little more than .1 cent per KWH. Other applications include anti-matter rockets and annihilation of radioactive waste.

Inventor: Gordon L. Ziegler, Lacey, Washington, USA
benevolententerprises.org box.net/shared/k0g5nkkjfb6okhmyr6um
padrak.com/vesperman "Locomotive Power Sources"

Electron Spiral Toroid Spheromak Micro-Fusion Reactor

The Electron Spiral Toroid Spheromak (ESTS) Micro-Fusion Reactor was derived from an explanation for ball lightning. The ESTS is a plasma toroid that is self-organized and self-stable with no magnetic fields to contain it. All spheromaks reported to date dissipate in microseconds. The ESTS has been observed to endure with no confining magnetic fields for hundreds of milliseconds, and theoretically will remain stable for many seconds. The micro-fusion reactor's fuel comprises of hydrogen and boron.

Safe, pollution-free micro-fusion reactors could reliably generate electricity with capacities ranging from 10 kilowatts through 1000 megawatts at 10% of today's electricity price.

All transportation vehicles could be reliably and safely powered by micro-fusion reactors with substantially lower production, operating and maintenance costs, and without toxic emissions.

The mass and cost of aircraft may be reduced by 70%. Space launch costs may be reduced by more than 95%.

Inventor: Clint Seward, Acton, Massachusetts, USA electronpowersystems.com
US Patents 5,175,466, 5,589,727, 5,773,919, and 6,140,752
padrak.com/vesperman "Locomotive Power Sources"

Moe-Joe Orgone Energy Cell

In spring 2008 a spherical Moe-Joe Orgone Energy Cell, operating as an orgone energy accumulator, was installed in a 1993 Saturn. Orgone energy is transferred from the cell through a tube into the engine via its PCV valve intake. The Saturn's mileage jumped from 30 MPG to 47 MPG with 90% less exhaust pollutants.

The Moe-Joe orgone energy cell comprises of four concentric thin spherical stainless steel shells – 5, 4, 3, and 2 inches in diameter. The ball is filled with specially charged water and then sealed. Holes allow the special water to circulate between the inner shells. The Moe-Joe orgone energy cell does not generate hydrogen nor Brown's gas. Electrodes at the cell's north and south poles are respectively wired to the battery's positive post or engine ground. One end of the orgone energy transfer tube is fitted over a bolt about 30 degrees off the north pole. The charged water itself does NOT enter the engine. It is orgone energy that significantly adds power to the engine.

A car's computer injects more fuel when its oxygen sensor senses the fuel mixture becoming too lean. Special electronics are required to fool the computer. Standalone non-computerized diesel and gasoline generators would consume much less fuel.

Inventors: Joe, Australia, and Moshe Daniel Block, Lachine, Quebec, Canada moe-joe-cell.com
padrak.com/vesperman "Torsion Field Physics and Torsion Field Communications" and
"Advanced Technologies for Foreign Resort Project"
James DeMeo's "Orgone Energy Accumulator Handbook"

Thorium Powerpack

Thorium is abundant enough to power the entire planet for millennia. The Thorium Powerpack is inherently safe with no risk of "meltdown" nor radioactivity contamination. Its nuclear reaction simply stops when its neutron exciter is turned off.

A thorium powerpack's neutron excitor relies on resonant phonon pair cleavage using specifically designed nuclear lattice holo-forms (holographic waveforms) to induce neutron imbalance in a host atom where the host atom then attempts to establish "balance" through the liberation of neutrons.

Maintenance-free thorium powerpacks can generate 50 or 100 kilowatts for home use, and up to 1 megawatts for other uses at 10% of current electricity prices . They actually are "power amplifiers" with power outputs of 60 times over input power.

Inventor: Robert J. Dratch, Black Hawk, Colorado, USA bob-dratch.org
padrak.com/vesperman "Locomotive Power Sources"

Capacitive step-down Transformer

The Capacitive step-down Transformer is a simpler, cheaper, lighter, smaller, nearly 100% efficient alternative to inductive transformers. Capacitive step-down Transformers do not have inductive, noise, heat and sound losses of inductive transformers.

Capacitive step-down Transformers can be used anywhere that is stepping down high voltages, low amperes into lower voltages, higher amperes – industry, commercial, residential and appliances. Not using Capacitive step-down Transformers has resulted in lower efficiency of transmission and distribution with enormous waste of electricity.

Capacitive Power Supplies are inherently capacitive amperage limiting. So therefore short circuits do not damage them. A brownout or blackout in one area of the grid will not take down any generators that are protected with CPS technology. There is no need for electronic controls or a grid infrastructure upgrade – the amperage control is automatic and instantaneous. If a solar flare blows out many inductive transformers, Capacitive step-down Transformers can be fast, effective replacements.

Capacitive step-down Transformers can also be reconfigured quickly and easily onsite to handle more or less wattage or to change voltage and amperage ratios. All applications that use step-down transformers can be converted.

Inventor: George Wiseman, Oroville, Washington, USA
Author of “Capacitive Battery Charger” eagle-research.com

Environmental Heat Engines for Emergency Nuclear Fuel Cooling

Problem: Every century or two the sun aims towards the earth a huge coronal mass ejection causing an electromagnetic storm intense enough to blow out numerous inductive transformers. Power grids could go down for months. But nuclear reactor cooling pumps can only rely on diesel generators for at most a few days. Blackout-crippled refineries would not be able to supply diesel fuel for several months. Without cooling pumps, nuclear reactors and spent fuel storage pools would overheat – releasing catastrophic radiation ala Chernobyl and Fukushima.

Solution: Efficient and pollution-free environmental heat engines absorb ambient heat to expand a working fluid such as Freon or ammonia which pushes pistons through sealed chambers. An environmental heat engine can utilize a nuclear reactor’s own natural low-grade heat to drive an auxiliary generator. The reactor’s cooling pumps can be powered with the generator’s electricity until the local power grid is eventually restored.

Robert Stewart’s "Stewart Cycle" engine, Vapor Actuated Power Generating Device, Patent No. 4,033,136; Ralph J. Lagow's Method of Generating Power from a Vapor, Patent No. 4,693,087; Ken Rauen's Rauen cycle and Superclassical cycle engines; and George Wiseman’s Wise cycle.

Inventors: Robert Stewart, Ralph J. Lagow, Ken Rauen, and
George Wiseman, Oroville, Washington, USA eagle-research.com

Thank you for your comment, Tomas Lopez.

The comment tracking number that has been assigned to your comment is SEDDsupp20040.

Comment Date: January 23, 2012 16:17:33PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20040

First Name: Tomas
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Address 3:
City: Santa Fe
State: NM
Zip: 87594
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

I have read and followed the survey for the East Mogotes. In the beginning, I understood that US Department of Interior and US Department of Energy would liked to have collaborated among BLM, Tribal, and private entities. My families owns one section of private property adjecent to one section of land grazing permit in the East Mogotes. For three generations my family depended on this use to support their families.
I have tried to contact electic companies regarding the possibilities of using the property for solar use and I have not received one response. My family would have liked to have supported their famiiies for generations to come by leasing our property. It seems the less affluent you are the opportunity to achieve economic success is unlilely. The concept of mass solar as described in the report coulld bring energy beyound my comprehension and would bring to Conejos County employment and revenues by way of taxes is unimaginable.

Wiil the departments hold to what was committed to the beginning of their exploration?

Thank you for your comment, Marc Syrene.

The comment tracking number that has been assigned to your comment is SEDDsupp20041.

Comment Date: January 23, 2012 16:25:59PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20041

First Name: Marc
Middle Initial:
Last Name: Syrene
Organization:
Address: 700 Cedar st.
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Address 3:
City: Del Norte
State: CO
Zip: 81132
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Hello, I would like to comment on the over 100,000 acres of public land in the San Louis Valley Colorado that is being considered for industrial solar developement. I am very opposed to this. For one I don't know how it does not violate the multi use laws that govern these lands. Once a solar farm goes up it is fenced off and no access to the public and no other use will it have indefinitely. The corporation who developes it stands to benefit greatly while the public and the environment loses greatly. Don't get me wrong, I am for renewable energy and have hydronic solar heat and passive solar heat on my home. I just don't think you have to rob Peter to pay Paul when it comes to a renewable and sustainable future. I am for point of use instalations and brown field instalations, which there are plenty of. If you want to subsidize renewable energy then do it in the form of feed in tariffs. please do not use up these ever more rare large contiguous pieces of land that are so precious to the ecology. We just can't keep gobbling up every thing. There is a much better way. Please preserve these public land for the public and ecology and find a way to do this in a better way. We only get one chance to do this right. Feed in tariffs allow communities and private individuals to be a part of and benefit from a renewable energy future and as has been proven accomplish it faster and without the need for new power lines. Please vote for the people and environment and not these big companies. I have a friend who's job it is to dig up endangered turtles in the Mohave and try and relocate them out of the way of these huge solar farms. This is mind boggling this day and age. We know better.

Thanks for recieving my input- Marc.

Thank you for your comment

The comment tracking number that has been assigned to your comment is SEDDsupp20042.

Comment Date: January 23, 2012 16:49:07PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20042

First Name: [Withheld by requestor]
Middle Initial:
Last Name: [Withheld by requestor]
Organization:
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Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold name and address from public record
Attachment:

Comment Submitted:

Thank you for the opportunity to comment. I believe that there should be an alternative that considers the impacts of distributed solar vs. maga solar plants. Distributed solar being the production of energy where it is used, such as rooftops, parking lots, brownfields.
This would impact the current grid system. How? What would it take to improve the current grid to accomodate distributed solar?
We should NOT be using public lands for clean, renewable energy until we have looked at and evaluated all other alternatives - including distributed solar.
We should NOT be giving financial preference to companies which use up our public lands without first looking at ALL the alternatives.

Thank you for your comment, Susan Pintus.

The comment tracking number that has been assigned to your comment is SEDDsupp20043.

Comment Date: January 23, 2012 19:15:09PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20043

First Name: Susan
Middle Initial: A
Last Name: Pintus
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Attachment:

Comment Submitted:

Dear Ms. Resseguie:

It has come to our attention that most of the Vinagre Wash Special Management Area that is proposed in Senator Dianne Feinstein's California Desert Protection Act of 2011 (S. 138)is zoned as a "variance area," or "lands available for solar energy right-of-way applications" under the Modified Program Alternative in the SPEIS.

We urge you to remove the proposed SMA from the variance area because:

• It is composed of extremely rugged, rolling terrain that is inappropriate for solar development;
• The portions that are relatively flat are in large washes that experience violent flash floods;
• The US Navy uses the SMA to train some of its most elite personnel, including the SEALs, and from what we understand the area must remain undeveloped for it to meet the Navy's training needs;
• It is a popular area for family recreation, including backcountry four-wheeling opportunities that are not available elsewhere in the region;
• It is adjacent to the Indian Pass Wilderness and lands that are proposed as potential wilderness in S. 138;
• The area contains many important Native American cultural sites; and
• The area is known for its great ecological diversity and importance, especially the riparian woodlands that grow along Milpitas Wash.

Thank you for considering our comments.

Thank you for your comment, Bonnie Poulos.

The comment tracking number that has been assigned to your comment is SEDDsupp20044.

Comment Date: January 23, 2012 23:12:52PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20044

First Name: Bonnie
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Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

New energy sources are not an excuse to put development on wild lands. The transmission lines should take the path that causes the least amount of damage to the land and uses existing corridors as much as is physically possible. Fiscal considerations are only one of the variables that must be considered, and if it is more expensive to use existing corridors, then we need to find other partners who can find a way to route them along already developed areas.

Thank you for your comment, Matthew Slowik.

The comment tracking number that has been assigned to your comment is SEDDsupp20045.

Comment Date: January 24, 2012 10:39:15AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20045

First Name: Matthew
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Attachment: SB County Comment Ltr on Supplement Draft PEIS_01-17-2012.docx

Comment Submitted:

LAND USE SERVICES DEPARTMENT

COUNTY OF SAN BERNARDINO

PLANNING DIVISION
385 North Arrowhead Avenue • San Bernardino, CA 92415-0182
(909) 387-4237 Fax (909) 387-3223
http://www.sbcounty.gov/landuseservices

Christine Kelly
Director

January 17, 2011

Solar Energy Supplement (Solar Energy Draft PEIS)
Argonne National laboratory
9700 S. Cass Avenue- EVS/240
Argonne, Illinois 60439

RE: **San Bernardino County Review and Comments on the Supplement to the Draft Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States [DES 11-49: DOE/EIS-0403D-S]: Doc: 1610 (300)**

Attn U.S. Department of the Interior, and U.S. Department of Energy:

Thank you for providing us a copy of the above-stated document. San Bernardino County has reviewed the Supplement to the Draft PEIS and is providing the following comments:

SUMMARY OF THE SUPPLEMENT TO THE DRAFT PEIS

- The County recognizes that a primary objective of the Solar Energy Program is to increase certainty regarding solar development of BLM-administered lands by identifying and prioritizing specific locations best suited for utility-scale solar energy development on public lands. And, in so doing, BLM's intent is to comply with the Energy Policy Act of 2005. To this end, the BLM proposes a "***preferred alternative***" to emphasize the concept of Solar Energy Zones (SEZs), and also allows for solar energy development projects outside of SEZs [through a "***variance***"]. Further, there is a process/protocol included to identify new SEZs (based on a minimum 5-year review). Additionally, the Department of Interior (DOI) is encouraging development of renewable energy on appropriate "non-federal land".

- The BLM defined the scope (magnitude) of solar energy development as the "***Reasonably Foreseeable Development Scenario***" (RFDS) for purpose of evaluation in the PEIS. Table 1.6-1 (page 1-8) of the Supplemental PEIS identifies the corresponding developed acreage estimates for the Reasonably Foreseeable Development Scenario. For California, it is estimated that **138,789 acres** of BLM land, and **46,260 acres** of non-BLM land would be required to accomplish the RFDS. The estimated total is 185,049 (BLM and non-BLM land).

- Table 2.3-1 (page 2-43) identifies the potentially developable BLM-administered land in California for each of the three project alternatives evaluated in the Supplemental PEIS. These are summarized as follows:

No-Action Alternative	**10,815,285 BLM Acres**
Modified Program Alternative (BLM-Preferred Alternative)	**1,354,559 BLM Acres**
Modified SEZ Alternative	**153,627 BLM Acres**

- The proposed "**variance areas**" (and associated variance process) would only apply to utility-scale solar development (i.e., projects capable of generating 20 MW or greater of electricity). Approved variances would allow utility-scale solar development outside of SEZ areas. The BLM will consider variance applications on a case-by-case basis; and, these are discretionary decisions. The main difference between the "**Modified Program Alternative**" and the "**Modified SEZ Alternative**" is the amount of land available for utility-scale solar development due to the "variance process". The "Modified SEZ Alternative" does not include the "variance process". As indicated in Table 2.3-2 (captions) the difference is as follows:

  Total Plan Area (i.e. all six States):

  - Modified SEZ Alternative
    - Approximately 285,000 BLM-acres are available in priority areas
  - Modified Program Alternative
    - Approximately 285,000 BLM-acres are available in priority areas
    - Approximately 20 million acres subject to variance process

  This (variance process) is also the primary reason for the identified difference in the amount of available land in California slated for utility-scale solar development (Table 2.3-1):

  California (only)

  - Modified SEZ Alternative
    - Approximately 153,637 BLM-acres
  - Modified Program Alternative
    - Approximately 1,354,559 BLM-acres

  [NOTE: The other aspects of the Program such as SEZ-specific design features, exclusion areas, authorization policies, and adaptive management, are the same for these two alternative program proposals].

ANALYSIS OF POTENTIAL ENVIRONMENTAL IMPACTS OF ALTERNATIVES- INADEQUATE

Although the PEIS admits the analysis is almost purely qualitative, it appears that Table 2.3-2 (in its entirety), oversimplifies the analysis. The "Summary-Level Assessment of Potential Environmental Impacts by Alternative" (Table 2.3-2), and the "Analysis of the Impacts of the Modified Solar Energy Development Program (Section 2.3.1, pages 2-62 through 2-69) provide an inadequate assessment of potential environmental impacts of the "Modified Program Alternative".

The analysis repeatedly claims that the "Modified Program Alternative" somehow, qualitatively "***minimizes***" potential environmental impacts when compared with the "Modified SEZ Alternative"; and, "***minimizes***" potential environmental impacts, in general. This disposition primarily hinges on two claims:

- First, that the "Modified SEZ Alternative" could increase the magnitude of potential impacts as the impacts would be concentrated into a smaller area.

- Second, that potential environmental impacts will be "***minimized***" as a result of the "variance" component of the "Modified Program Alternative".

The claim that the "Modified SEZ Alternative" would have increased magnitude of potential environmental impacts as the impacts would be concentrated into a smaller area (as compared to the Modified Program Alternative) fails to recognize that: 1) the Modified SEZ Alternative includes the process to add new SEZs, 2) that the authorization policies, adaptive management, specific design features, and exclusion areas are common to both alternatives, 3) that identification of additional available solar development areas is occurring through the California DRECP Planning effort, and 4) that SEZ areas have been identified based on an inherent (known) existing "low resource conflict".

Thus, for the reasons stated above, the Supplemental PEIS qualitatively, wrongly, implies that the "Modified SEZ Alternative" (as compared to the Modified Program Alternative) will have greater (and/or an increased "magnitude" of) potential impacts as the impacts would be "concentrated into a smaller area". Further, the SEZ feature/component is similar to both alternatives, and thus the "potential impacts" that could occur (within the SEZ areas) are thus, not any lesser or greater (in magnitude, or degree) for either alternative regardless of other non-SEZ features/aspects of each alternative.

Potential environmental impacts may be "less" (or "more") for one alternative relative to another alternative, however, there is no justification, in the Supplemental PEIS that potential environmental impacts will be "**minimized**" as a result of the "variance" component of the Modified Program Alternative; nor, "**minimized**" by the Modified Program Alternative, in general. In fact, the opposite is likely the case. The "variance" component is the distinguishing feature among the alternatives. The Modified Program Alternative (w/variance component) includes 1.2 million more BLM-acres subject to potential environmental impacts (as compared to the Modified SEZ Alternative). Also, it is undefined as to how much of this additional 1.2 million BLM-acres is in San Bernardino County. Clearly, potential impacts to 1,354,559 BLM-acres (Modified Program Alternative) are greater than potential impacts to 153,627 BLM-acres (Modified SEZ Alternative). Further, it is undefined as to what impacts will occur to private lands in San Bernardino County.

UNRESOLVED SAN BERNARDINO COUNTY CONCERNS

Because of the unknown/undefined potential environmental impacts to San Bernardino County, we have the following, ongoing concerns (particularly regarding the Modified Program Alternative (i.e., BLM-Preferred Alternative). The following comments are restated from our April 11, 2011 comment letter on the Draft Programmatic EIS:

1. Mitigation Lands

[First], the "Solar Energy Development Program Alternative" [now, the "Modified Program Alternative"] is the BLMs/DOEs stated preferred alternative. This alternative includes 21.5 million acres of BLM administered lands; 1.76 million acres of these lands in California (as shown in Table ES 2-1). Under this alternative, it is highly likely there would not be enough land in the affected California-Counties to be able to mitigate this amount of renewable energy project development. For this reason alone, the statement made on page ES-29, lines 21-23, regarding the "Solar Energy Development Program Alternative" (i.e. "BLM's Preferred Alternative"), that, "Simultaneously, it (i.e. this alternative) would provide a

comprehensive approach for ensuring that potential adverse impacts would be **minimized** to the greatest extent possible," is unfounded.

This point is extremely important, and in fact critical to San Bernardino County. The fundamental issue is that the wildlife agencies, specifically the U.S. Fish and Wildlife Service (FWS) and the California Department of Fish and Game (CDFG), have been requiring mitigation for desert tortoise to include the acquisition of private land and subsequent donation ("compensation") of the land to either BLM or CDFG. The mitigation ratio is often as high as three (3) acres of private land per acre (1) of development. This has the effect of increasing the federal estate in the County, and taking land off the tax rolls. The federal Payment in Lieu of Taxes (PILT) program does not provide funding to offset this loss of revenue. Most critically, and germane to the mitigation issue, is that a) private lands are diminishing in the County and will likely not exist in sufficient quantity to meet mitigation requirements, b) as land leaves the tax rolls, the ability of the County to maintain its infrastructure and supply services diminishes at the very time the solar developments will increase use of those very services, and c) San Bernardino County, like all Counties in California, is unable under state law to collect property tax (which might offset at least part of the loss and cost) on the capital investments made for solar developments as a result of State law exempting such development. The County has advocated that mitigation be changed to a development/mitigation fee in which the funds can be directed to direct projects which could foster appropriate land management, improvement and research, and such has been authorized under SB-34, a recent state law. However, to date, the wildlife agencies have been unwilling to accept such mitigation except in addition to land compensation. We believe that the Solar PEIS could and should become a further advocate for bringing the mitigation issue to the fore, and proposing that mitigation be in the form of investments for improvement, recovery actions and research on listed and candidate species, and that land acquisition and increasing the federal estate be removed as a mitigation measure.

[Second], the "Modified SEZ Alternative" would authorize solar energy development only in the identified SEZs. In addition to those listed, the BLM could decide later to increase or decrease the total SEZ area. The amount of BLM lands constituting the Modified SEZ Alternative in California is 153,637 acres. This amount of acreage is enough to support the estimated land needs of the "reasonably foreseeable (future) development scenario."

The amount of BLM lands constituting the "Modified Program Alternative" in California is 1,354,559. For this alternative, mitigation requirements in California could possibly exceed two or three million acres. Under this alternative, it is also highly likely there would not be enough land in the affected California-Counties to be able to mitigate this amount of renewable energy project development, unless our suggestion, above, were adopted.

If such mitigation lands, in their entirety, were to be private lands, then (for either of the two alternatives) there will not be enough mitigation lands in San Bernardino County; and for the reasonably foreseeable development scenario, it is highly probable that mitigation lands may be used up and not available for future development projects. The scale would render vast portions of private land unavailable for future use and would severely limit the ability of future development to adequately mitigate its impacts. *[NOTE: An example of such potential cumulative impact is the Ivanpah SEGS Project. The mitigation set aside for this 4,073 acre project is 8000 acres (at a 3:1 ratio). In San Bernardino County, 8,000 acres represents 5 % of the 140,000 acres of potential desert tortoise habitat held in private lands within the County.*

[Third] given that the PEIS will apply to projects that will have direct and indirect impacts upon private lands, and given that nothing in the PEIS document specifies which type of lands (public or private) will

be mitigation lands; therefore, San Bernardino County recommends the following kinds of mitigation be included for consideration on any specific project:

- The land and wildlife management agencies determine an appropriate mitigation fee based on criteria associated with habitat replacement or other quantitative criteria. Such funds paid by the developer to a trust (such as currently exists under the auspices of the Desert Managers Group (DMG) and its MOU with the National Fish and Wildlife Foundation (NFWF), who would dispense the funds to appropriate mitigation projects and measures. Issuance of the Revised Recovery Plan for desert tortoise is imminent, and Recovery Action Plans (RAPs) will be developed for each recovery unit. Implementation will require funding, and such funding will be limited from appropriations, thus mitigation funds will be an appropriate and welcome source with which to proceed with carrying out the RAPs. We envision such funding would be used for projects such as fencing, habitat restoration, invasive weed control, hazard reduction where hazards contribute to tortoise death, research, monitoring, increased enforcement, and population augmentation with programs such as head starting.

The developer could acquire private rights that exist on public land. Since many BLM-administered lands have use entitlements associated with them (particularly through right-of-way authorizations, etc.), then in terms of fairness to land owners (private property owners) and renters, lessees, permitees, or holders of valid existing rights (public property) alike, both public and private lands should be analyzed, evaluated, and considered for identification as potential mitigation lands. This strategy would result in greater equity among all parties in that mitigation responsibility would be shared among public and private landowners, renters, permitees, or lessees.

[Fourth], it is recognized, as stated on page 2-26, lines 15-16, of the PEIS that comments previously provided suggest, ". . . that the scope of the PEIS include evaluation of development on other federal lands . . . state lands, and private lands." The comment above is not repeating this suggestion. Rather, the comment above is stating that federal lands (with use entitlements) need to be considered or utilized as mitigation lands in a similar manner as private lands. BLM, through the process of revising the Land Use Plans (Resource Management Plans) should identify those public lands that could be identified or offered as mitigation lands (separate, and aside from, 'exclusion areas'). Further, follow-on site-specific environmental analysis of solar energy projects needs to include, consider, and utilize federal land as mitigation in a similar manner as private lands.

[Fifth], the County supports mitigation requirements that address the loss of historic and recognized land uses including dispersed recreation (OHV use or hunting), livestock grazing, and general public access to public lands. San Bernardino County recommends that projects which remove areas of relatively flat, accessible land historically providing for grazing allotments, access routes to back country, and open OHV play should be mitigated by the dedication of other areas of public land to such activities or possibly the acquisition of lands that can be so dedicated.

In summary, San Bernardino County recommends that the BLM/DOE identify and evaluate an additional alternative in the PEIS if the Final PEIS continues to endorse the use of private land acquisition and donation to the public estate. The additional alternative would be a "Solar Energy Zone (SEZ) Program at a scale commensurate with the Reasonable Foreseeable Development." This would provide an evaluation at a scale that balances the need to provide for renewable energy projects and at the same time could define a "realistic" extent of mitigation lands. Further, such alternative could factor in both public and private lands as potential mitigation lands. This would also need to provide for replacement of grazing allotments, access routes, open OHV play areas, etc. by dedication of other areas of "public land" to such activities. This type of alternative could ensure that mitigation lands are available in the

future, for other development proposals (i.e., projects other than renewable energy projects). The County's preferred alternative would be to shift mitigation to the charging of a development/mitigation fee which would provide for a suite of mitigation measures and could assure that such funding be spent on the highest priority projects with the highest expected benefit to the species for which mitigation is being sought.

2. Water

The Solar PEIS states (page 5-37, lines 22-24), "The six-state study area is largely composed of arid landscapes; thus water use by solar energy technologies is a significant consideration for water resources impacts and also requires the analysis of water and land management practices." Although identified as significant, the "water analysis" is lacking in the PEIS.

The PEIS states on page 5-39, lines 12-13, "In most areas, groundwater would likely be withdrawn from local aquifers to meet the project's water needs," and on page 5-37, lines 24-27, "acquiring reliable, long-term water supplies to support utility-scale solar facilities would entail either the acquisition of unallocated water supplies (depending on availability) or the conversion of existing water rights from current uses." Although it is presumed most water will come from groundwater basins, no evaluation of impacts to groundwater basins is included in the PEIS. Without clarity of impacts upon water resources, how can appropriate, applicable, realistic, meaningful mitigation measures be identified?

Unfortunately, the PEIS only provides "General Estimates of Water Requirements for Various Solar Power Plant Configurations" (page 5-45, Table 5.9-1). There is no link of these stated water estimates to actual water demand or to actual water availability (supply).

Also, the PEIS (page 5-46, lines 24-34) gives a series of "Potentially Applicable Mitigation Measures." These "measures" (which are basically "hopes" and "desires") are stated on pages 5-47 through 5-55. All of these "measures" describe what "should" occur or what is "hoped or desired" to occur, but have no substance as to what "can" or "will" occur regarding mitigation of significant impacts to water. "Measures" such as

- "Project developers should quantify water use requirements for project construction, operation, and decommissioning" (page 5-50, lines 7-8), and
- "The use of water should not contribute to the significant long-term decline of groundwater levels or surface water flows and volumes. Any project-related water use should not contribute to withdrawals that exceed the sustainable yield of the surface water or groundwater source." (page 5-54, lines 39-42)

are stated as wishes, hopes, and desires; not as compulsory requirements. Per the PEIS, these "measures" are identified as only "potentially applicable." This means that significant impacts to water resources will likely not be mitigated.

Further, under San Bernardino County Ordinance 3872, adopted in October 2002, groundwater withdrawals in unadjudicated basins that will harm the Groundwater Safe Yield are not permitted. Groundwater Safe Yield is defined in Section 33.06553 (i) as: "The maximum quantity of water that can be annually withdrawn from a groundwater aquifer (i) without resulting in overdraft (ii) without adversely affecting aquifer health and (iii) without adversely affecting the health of associated lakes, streams, springs and seeps or their biological resources." The County of San Bernardino and the U.S. Bureau of

Land Management entered a Memorandum of Understanding in 2003 for implementation of Ordinance 3872 on public lands in the Mojave Desert.

In summary, as the entire Southwest has been in a severe drought this past decade and deliveries of imported water become increasingly unreliable, the PEIS must examine in detail the impact on water, including groundwater aquifers. The impacts upon water resources from solar energy projects will be significant, individually, and cumulatively. The PEIS must consider and evaluate the cumulative impacts on water supply throughout the desert in light on ongoing urban growth, reduced supplies, and the need to maintain the health of desert ecosystems. The water issue must be examined in total, and evaluation of all supplies and demands of water projected for the study areas must be performed. Only upon completion of such evaluation can appropriate, applicable, realistic, and meaningful mitigation measures be identified. "Mitigation" must be compulsory, rather than a "wish list" of actions. Given the scarcity of water, and existing appropriations, San Bernardino County recommends that the Final Solar PEIS must include an alternative or advocacy for the use of "dry" technology for development.

3. Endangered Species (and Special Status Species)

According to NEPA, the federal agencies are not required to implement mitigation measures. As a result, the Programmatic Environmental Impact Statement (Chapter 5) only includes "Potential Mitigation Measures." Thus this Chapter identifies "Potential Mitigation Measures" that "should be" implemented, but also may not be implemented. Further, pages 5-62 (Table 5.10-1), 5-96 (Table 5.10-2), 5-110 (Table 5.10-3), and 5-123 (Table 5.10-4) state that for the overall project evaluated in this PEIS, the ability to mitigate impacts to habitat, plants and wildlife, aquatic resources, and special status species (including threatened, endangered, sensitive, and rare species) is "relatively difficult," and, "depends on the size of area development," and "depends on site-specific conditions." Thus, the PEIS is inconclusive as to the ultimate impact upon endangered (and special status) habitat, plant, and wildlife species. The ultimate impact upon endangered (and special status) habitat, plants, and wildlife species can only be determined at the project-specific evaluation level. Since the ability to mitigate impacts can only be determined upon identifying the size of area to be developed, and at the project-specific evaluation level, then the PEIS cannot conclude impacts to endangered (and special status) habitat, plants, and wildlife will be "mitigated;" nor make any conclusions about "impacts" to endangered (and special status) habitat, plants and wildlife.

The mitigation measure on page 5-131, lines 39-42, states, "If any federally listed threatened and endangered species are found during any phase of the project, the USFWS should be consulted as required by Section 7 of the ESA, and an appropriate course of action should be determined to avoid or mitigate impacts," and the measure on page 5-134, lines 3-4 and 36-38, states, "The plan should include but not necessarily be limited to the following element, where applicable: . . . Measures to mitigate and monitor impacts on special status species developed in coordination with the appropriate federal and state agencies (e.g., BLM, USFWS, and state resource management agencies)." Relative to these particular mitigation measures, San Bernardino County opposes the acquisition of habitat at a multiplied (e.g., 3:1) mitigation ratio for desert renewable energy projects because the scale of the proposed projects (as defined by the PEIS) would render vast portions of private land unavailable for future use and could severely limit the ability of future development to adequately mitigate its impacts. Instead, San Bernardino County supports the implementation of an "in-lieu" fee program that will provide much needed funding for conservation, habitat restoration, implementing species recovery strategies, and predation control, but not be used to purchase vast tracts of mitigation lands or impose additional restrictions on public or private land.

4. Infrastructure Impacts- Development-Operations-Funding

The PEIS only addresses "Transportation" from a narrowly defined perspective, that is: Traffic Hazards and Circulation/Capacity. The PEIS does not address "Transportation" from the "Development-Operations-Funding" perspective. Thus, the PEIS general mitigation measures on pages 5-257, lines 12-46, and page 5-258, lines 1-3 (of the Draft PEIS), related to "Transportation" only focus on "Traffic Management Plans" and traffic hazards reduction.

Thus, the PEIS does not provide any information relative to how the proposed program (as defined in the PEIS) will impact "Transportation" from the development, operations and funding standpoints. No current mechanism exists to address the impacts these projects will have on public safety facilities and transportation infrastructure in San Bernardino County. Large scale development existing in desert areas is already underfunded for public safety facilities because of significant federal ownership. Also, the proposed program (as defined in the PEIS) will only exacerbate impacts on the County's limited financial resources. According to the County's policy statement relative to these types of projects, the County is open to "a variety of approaches to address this issue, including targeted Development Impact Fees and/or direct mitigation in the form of developer constructed facilities, and is requesting that the state and federal energy and resource agencies (California Fish and Game, U.S. Fish and Wildlife Service, California Energy Commission, BLM, etc.) implement policies and procedures requiring developers of utility-scale renewable energy projects to enter into mitigation agreements, pay appropriate fees, or develop other mechanisms to mitigate impacts on local agencies." The County recommends including this language in the PEIS as mitigation.

Also, no current mechanism exists to address the impacts these project will have on the ongoing costs of providing adequate public safety and transportation services, as well as the loss of recreation and tourism revenue. Again, according to the County's policy statement, the County is open to "a variety of approaches to address this issue, including Possessory Interest Tax, Federal Lease Revenue Sharing, Community Facilities District Formation, and others." The County recommends including this language in the PEIS as mitigation. Preliminarily, it appears that the ongoing operation and maintenance costs will be addressed by a Possessory Interest Tax, which should approximate property tax revenue given the expected long term of a federal land lease.

5. Mining

The potential impacts (of either proposed Alternative) upon mining in San Bernardino County are unclear/unknown.

SUMMARY

San Bernardino County has goals similar to a number of local county and city jurisdictions regarding renewable energy, including:

1) Encourage economic growth and job creation;
2) Conserve our unique natural resources;
3) Find the best balance to achieve both of the above;
4) Encourage sustainable renewable energy projects;
5) Require projects to pay their own way so our taxpayers don't subsidize them; and

6) Support practical mitigation strategies that do not consume excessive amounts of land.

We also have concerns similar to a number of local jurisdictions, including:

1) Large-scale project will result in lost economic opportunities. Tourism, mining, grazing, film industry, and recreational opportunities will be lost.
2) The current California Department of Fish and Game paradigm requires multiplying project lands by a ratio not found in any regulations or even a written policy. Some projects are hit with additive mitigation for different species. The Modified Program Alternative (1,354,559 BLM acres in California) would involve a quantity of mitigation acreage that likely would not be sustained in San Bernardino County. These lands also represent lost economic opportunity and thus increase the project impacts.
3) There is no clear path for local governments to have economic impacts addressed and mitigated. Costs to local infrastructure and public services are not fully addressed by federal agencies or the California Energy Commission.

Local governments support renewable energy, and we look forward to the positive economic impact the development of these projects can bring to our local economy. This proliferation of energy projects in the Mojave Desert require careful evaluation and consideration of the appropriate mitigation measures that are needed to protect the environment, future development, and the economy of our region. Because many of these projects will be built on federally-owned land or are under the jurisdiction of the California Energy Commission, local governments do not have control over them. Yet the projects result in impacts on local government infrastructure and services with no clear mitigation mechanism. As stated above, the Solar Preliminary Environmental Impact Statement does not adequately address these impact issues.

If you have any questions, regarding this letter, please direct them to Matt Slowik at mslowik@lusd.sbcounty.gov or call him at (909) 387-4237.

Sincerely,

CHRISTINE KELLY, DIRECTOR
Land Use Services Department

Cc: Brad Mitzelfelt, First District Supervisor
Gerry Newcombe, Deputy Executive Officer
Bart Brizzee, Deputy County Counsel
Bobby Lewis, Planning Director
Terri Rahhal, Planning Manager

Thank you for your comment, Annie Walker.

The comment tracking number that has been assigned to your comment is SEDDsupp20046.

Comment Date: January 24, 2012 11:51:13AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20046

First Name: Annie
Middle Initial:
Last Name: Walker
Organization:
Address: [Withheld by requestor]
Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold address from public record
Attachment:

Comment Submitted:

Dear BLM,
I am a user of public lands, and find them vital to my existence. For some weeks I have been following the controversy over utility sized solar and wind power installations.
Firstly, privately owned utilities do not belong on public land which has been set aside for wildlife and to preserve the last remnant of relatively unspoiled lands in California FOR THE PUBLIC. Allowing developers of utility solar and wind to destroy pristine desert lands for their own benefit is reprehensible.
None of the alternatives In the EIS are acceptable to me. After studying the Supplement to the Programmatic EIS, I see that the preferred alternative has a loophole which says that if a developer with a 'well site' project cannot find a location in an official Solar Energy Zone, then the DOI has created a variance such that they can develop outside the SEZ, basically making available for destruction the whole 22 million acres of public land out there.
When all roofs in California and Nevada have their own solar panel, then is the time to develop on previously degraded lands. There are plenty of degraded exurban lands, abandoned fields, old mine dumps, and superfund sites.
The desert is not a vast and worthless land just waiting for development. Public lands anywhere are our last link to nature.
Thank you for your attention to this letter.

Thank you for your comment, Steven McCarroll.

The comment tracking number that has been assigned to your comment is SEDDsupp20047.

Comment Date: January 24, 2012 13:45:30PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20047

First Name: Steven
Middle Initial: J
Last Name: McCarroll
Organization: Conejos County Commissioners
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Address 2:
Address 3:
City: Conejos
State: CO
Zip: 81129
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: PEIS comments.pdf

Comment Submitted:

CONEJOS COUNTY -1861- COLORADO

Board of County Commissioners

J. Steven McCarroll
Chairman

John Sandoval
Vice Chairman

Mitchell Jarvies
Vice Chairman

January 23, 2012

Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue – EVS/240
Argonne. IL 60439

To Whom It May Concern:

The Conejos County Board of Commissioners have been to several presentations on the Draft Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development which includes a vast area of Conejos County Private and Public lands. The Board of Commissioners offers the following comments:

- The County has a concern on the large acreage proposed, which is Los Mogotes East 2,650 acres, the Antonito Southeast 9,712 acres and the close proximities to two of our municipalities.
- Question the economic benefit on utility rates to the citizens of Conejos County. Question the overall economic impact to Conejos County in the long range.
- Conejos County has concerns over impact on revenues from PILT (payment in lieu of taxes) if the large areas were to be taken out of the Pilt formula.
- Conejos County is limited on exiting transmissions. We are concerned about the process and effects of transmission lines and infrastructure on roads, bridges, public and private property, and also property rights.
- Such as large scale proposal would most likely affect the wildlife and other habitat in the area.
- The high use and its availability may add to the struggle that faces the Conejos River to meet the command of the State Compact on the Conejos and Rio Grande Rivers.

Thank you for the opportunity to comment.

Sincerely,
Conejos County Board of Commissioners

Steve McCarroll
Chairman

P.O. Box 157 • Conejos, CO 81129 • (719) 376-5772 • Fax: (719) 376-5661

Thank you for your comment, Steven McCarroll.

The comment tracking number that has been assigned to your comment is SEDDsupp20048.

Comment Date: January 24, 2012 13:54:16PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20048

First Name: Steven
Middle Initial: M
Last Name: McCarroll
Organization: Conejos County Board of Commissioners
Address: P. O. Box 157
Address 2:
Address 3:
City: Conejos
State: CO
Zip: 81129
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: PEIS comments.pdf

Comment Submitted:

CONEJOS COUNTY -1861- COLORADO

Board of County Commissioners

J. Steven McCarroll
Chairman

John Sandoval
Vice Chairman

Mitchell Jarvies
Vice Chairman

January 23, 2012

Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue – EVS/240
Argonne. IL 60439

To Whom It May Concern:

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- The County has a concern on the large acreage proposed, which is Los Mogotes East 2,650 acres, the Antonito Southeast 9,712 acres and the close proximities to two of our municipalities.
- Question the economic benefit on utility rates to the citizens of Conejos County. Question the overall economic impact to Conejos County in the long range.
- Conejos County has concerns over impact on revenues from PILT (payment in lieu of taxes) if the large areas were to be taken out of the Pilt formula.
- Conejos County is limited on exiting transmissions. We are concerned about the process and effects of transmission lines and infrastructure on roads, bridges, public and private property, and also property rights.
- Such as large scale proposal would most likely affect the wildlife and other habitat in the area.
- The high use and its availability may add to the struggle that faces the Conejos River to meet the command of the State Compact on the Conejos and Rio Grande Rivers.

Thank you for the opportunity to comment.

Sincerely,
Conejos County Board of Commissioners

Steve McCarroll
Chairman

P.O. Box 157 • Conejos, CO 81129 • (719) 376-5772 • Fax: (719) 376-5661

Thank you for your comment, Eleanor Mueller.

The comment tracking number that has been assigned to your comment is SEDDsupp20049.

Comment Date: January 24, 2012 14:33:35PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20049

First Name: Eleanor
Middle Initial:
Last Name: Mueller
Organization:
Address: 191 Cascade Overlook
Address 2: The Baca Grande
Address 3: P.O. Box 216
City: Crestone
State: CO
Zip: 81131
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

It has been said that the San Luis Valley in Colorado is/will become a national sacrifice zone.

As a native of the state, I request that Board of Saguache County Commissioners say no to the Solar Reserve, "Final 1041" because of the endless environmental concerns and that the few TEMPORARY jobs are not worth the cost.

Thank you for your comment, Alfredo Figueroa .

The comment tracking number that has been assigned to your comment is SEDDsupp20050.

Comment Date: January 24, 2012 15:11:10PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20050

First Name: Alfredo
Middle Initial: A
Last Name: Figueroa
Organization: La Cuna de Aztlan Sacred Sites Protection Circle
Address: 424 North Carlton Ave.
Address 2:
Address 3:
City: Blythe
State: CA
Zip: 92225
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: Solar PEIS Public Comments.pdf

Comment Submitted:

Attached you will find our comments letter.

Thank you,

Alfredo Acosta Figueroa

La Cuna de Aztlan Sacred Sites Protection Circle

Alfredo A. Figueroa
424 N. Carlton Ave
Blythe, Ca 92225

Phone: (760) 922-6422
E-mail: lacunadeaztlan@aol.com

Jane Summerson
Department of Energy
Washington Office
jane.summerson@ee.doe.gov

Shannon Stewart
Bureau of Land Management
Washington Office
shannon_stewart@blm.gov

Draft Solar Energy Programmatic EIS
Argonne National Laboratory
9700 S. Cass Avenue-EVS/240
Argonne, IL 60439

Solar PEIS Public Comment

Alfredo Acosta Figueroa
Chemehuevi Tribal Monitor
Elder/Historian of La Cuna de Aztlan Sacred Sites Protection Circle
424 North Carlton Ave.
Blythe, CA 92225
(760) 922-6422
Email: lacunadeaztlan@aol.com

This letter is in reference to the Solar PEIS Public Comments regarding the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States.

Our non-profit La Cuna de Aztlan Sacred Sites Protection Circle is a Native American organization which mission is to protect and preserve sacred indigenous sites that are located along the Colorado River. Our organization has an MOU with the BLM to be guardians of these sacred sites that begin in Spirit Mountain (North of Laughlin, NV) and are centered in the Palo Verde/Parker Valleys, down to the Gulf of California (South). These sites include the world famous Blythe Giant Intaglios, Kokopilli, Cicimitl, El Tosco, and Bouse Fisherman Geoglyphs as well as over 300 other geoglyphs (Intaglios), thousands of petroglyphs, hundreds of pictographs and mountain images.

The government fast-track stimulus money programs have been a complete failure as demonstrated by the Solyndra Companies disaster. It is ridiculous to continue spending more government money to promote these projects. As we have found out, even birds that fly over these solar panels die because of the thousand degree heat that they create. In addition, natural habitat, wildlife and pristine desert environment will also be greatly affected.

In a recent article regarding the Jenko Solar Project in China, even the Chinese are protesting against the solar panel projects in their country because they have not only contaminated water but also the climate change has ruined their agriculture industry. Apparently not even China is benefitting from these thousands of solar panel projects. The Jenko Solar Project is an excellent example of why we do not need these projects near agricultural land nor the Colorado River.

We do not oppose to solar panels, we feel that they should be placed in areas that have already been disturbed as well as placing them on roof-tops and in urban areas where energy is mostly need (warehouses, supermarkets, apartments complexes, abandoned air bases, and along the current electrical transmission lines). This will exclude the need for transmission lines which has now presented major terrorist threats like the blackout that occurred on September 8, 2011 in Mexico, Yuma, Imperial, San Diego and Riverside Counties.

In order to amend the failing fast-track stimulus money solar programs concerning sacred sites, on January 17, 2012, the Colorado River, Eastern Riverside County Tribes and members of our organization met at the Agua Caliente Casino Conference Center in Palm Springs, California with the BLM and the Department of Interior representatives. This meeting was to discuss the sacredness of these areas and the vast destruction that has already taken place within the Blythe and Genesis Solar Power Project sites. Construction within the Genesis Solar Project site was stopped last month because the company came upon hundreds of Indigenous artifacts that were part of the old villages that formed part of the Coco-Maricopa East/West Trail (that traverses through the north end of the Ford Dry Lake). We currently do not have the final conclusion to this meeting by the BLM, but it is pending.

Our organization had submitted our comments concerning the sacredness of the Genesis Solar project and the Cultural Resource Docket # 09-AFC-8 of June 6, 2010 shows that the California Energy Commission own analysis estimates that more than 800 sites within the I-10 Corridor and 17,000 sites within the Southern California Desert Region, will potentially be destroyed.

For all these reasons, we are opposing to solar panel projects that are proposed to be place on sacred sites, pristine desert environment, especially in Eastern Riverside & San Bernardino Counties in California and the Mojave, La Paz and Yuma Counties in Arizona.

We are attaching some pictures of the destruction that took place on June 17, 2011 at the groundbreaking ceremony of the Solar Millennium project site (located 10-miles west of Blythe, California). During this event Governor Jerry Brown, Secretary Ken Salazar and Assemblyman Manuel Perez were all present. Also included is a flyer of the current State, Federal, Mexico and United Nations laws that support our demands and why these projects should not be constructed in these sacred areas.

Sincerely,

Alfredo Acosta Figueroa

Alfredo Acosta Figueroa

Please Help us Protect our Sacred Sites

Geoglyph image of the Creator in the form of Kokopilli (200ft long & 50ft wide) located within the Blythe Solar Power project site.

Geoglyph image of Cicimitl "The Spirit of the Underworld" which takes human spirits to their final resting place. (10x10 yards)

The images of Kokopilli & Cicimitl as well as numerous other Sacred Sites and trails are all located within the proposed Blythe Solar Project area that has already been approved by the California Energy Commission on September 15, 2010.

Kokopilli deciphered means Koko "Hurt" and Pilli "Our Lord" (in the Nahuatl language) and this is the Creators image of Quetzalcoatl in the form of a half human and half insect. In this image he is leaving because he is hurt and it represents the end of the third Sun as shown in the Five Suns of the Aztec Sun Stone Calendar. The image of Kokopilli is found all over the southwest United States and Mexico.

Cicimitl is one of the most important images of the Creator because it tells the story of the 4 places and directions that our spirits go according to how we lived and how we died on Mother Earth (This is all based in the Mexica Codex).

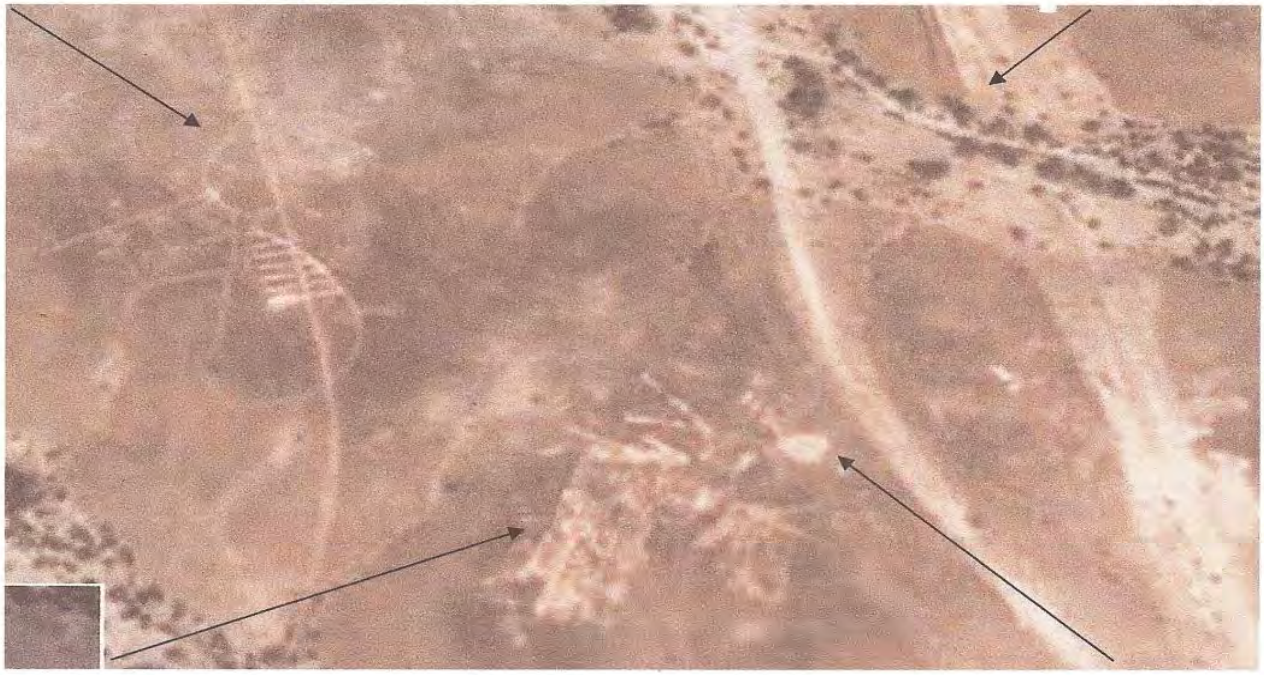
Included below are State, Federal, Mexico and United Nation laws that support our demands and why theses projects should not be constructed in these Sacred areas:

*Native American Sacred Places, March 6, 2003 (S.B. 18)
*Native American Sacred Lands Act, June 11, 2003 (H.R. 2419)
*The Sacred Land Protection Act, July 18, 2002 (H.R. 5155)
*The Native American Sacred Sites Protection Act, February 22, 2002 (S.B. 1828)
*Accommodations of Sacred Sites and Federal Land, Signed by President Bill Clinton on May 24, 1996 (Executive Order 13007)
*Native American Graves Protection & Repatriation Act of 1990
*Archeological Resource Protection Act of 1979
*American Indian Religious Freedom Act, August 11, 1978
*The Civil Right Act of 1968
*Antiquities Act of 1906

Please help our struggle by contacting Secretary of Interior Ken Salazar, President Barack Obama and your Congressman and Senators

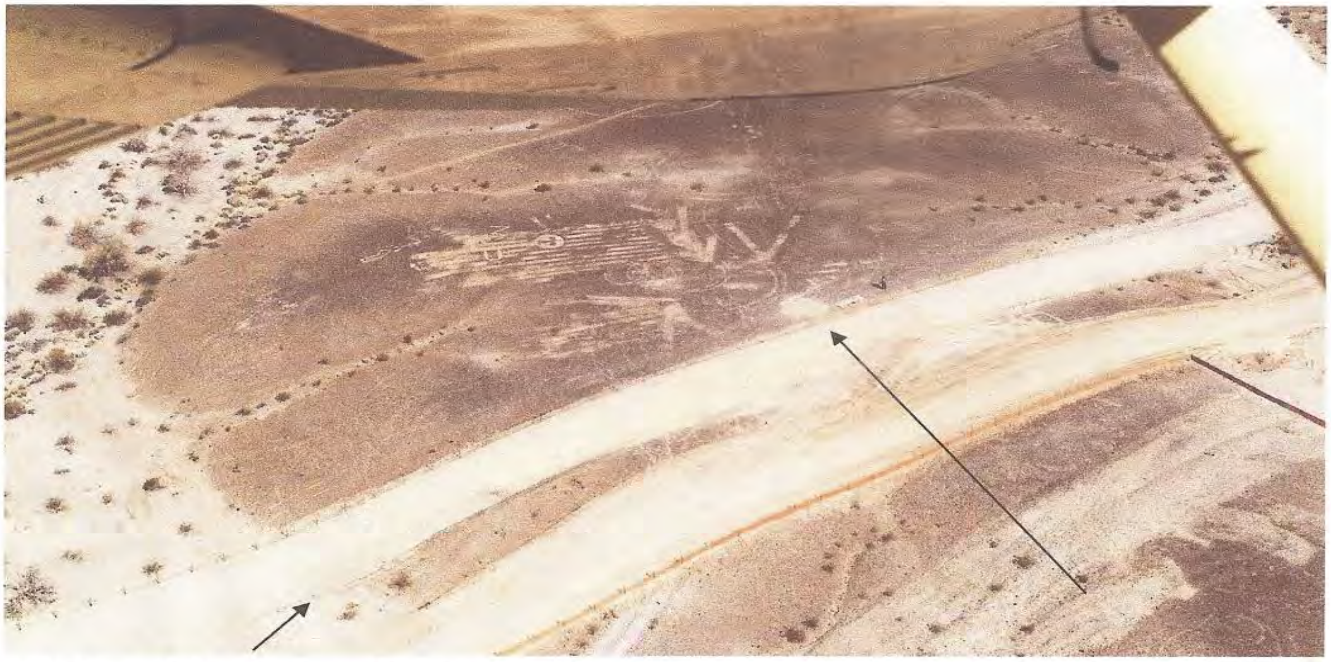
La Cuna de Aztlán Sacred Sites Protection Circle
Patricia Piñon, President & Alfredo Figueroa, Monitor & Historian
(760) 219-2834 or (760) 922-6422
lacunadeaztlan@aol.com

Kokopilli Geoglyph Before 2010 True North Geoglyph



Cicimitl Group Sun Geoglyph

After 2010



150ft wide x 5-miles long road Destroyed Sun Geoglyph

These are aerial photographs of the geoglyph images of Kokopilli (Kokopelli) and Cicimitl

Thank you for your comment

The comment tracking number that has been assigned to your comment is SEDDsupp20051.

Comment Date: January 24, 2012 15:37:15PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20051

First Name: [Withheld by requestor]
Middle Initial: [Withheld by requestor]
Last Name: [Withheld by requestor]
Organization: US Citizen
Address: [Withheld by requestor]
Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold name and address from public record
Attachment:

Comment Submitted:

Please adopt preferred BLM zones

Thank you for your comment, Joe Orawczyk.

The comment tracking number that has been assigned to your comment is SEDDsupp20052.

Comment Date: January 24, 2012 16:07:31PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20052

First Name: Joe
Middle Initial:
Last Name: Orawczyk
Organization:
Address: PO Box 361
Address 2:
Address 3:
City: Yermo
State: CA
Zip: 923980361
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

I want rooftop PV to become as ubiquitous as the microwave oven and I support the concept of the backyard mini-wind-turbine for the following reasons:

? local renewable power generation uses less water and land resources than remote solar does;
? rooftop solar and backyard wind turbines suffer less loss of energy from point of source to consumer than remote solar and wind power generator do;
? distributed renewable power generation will create more jobs than concentrated remote projects can, which will increase state and federal tax revenues as well as improve the relations between the voters and politicians in office;
? distributed renewable power generation reduces the risk of terrorist attack to our nation as the concentrated remote solar and wind make fine target during the heat of summer.

On this last point, consider how easy it would be for a terrorist to fire a .50 caliber round through the GE turbines inside the wind turbines or through the steam generators atop a power tower in a field of heliostats. Or a compression impact car bomb parked adjacent to those heliostats or trough mirrors. What a fine target in the middle of August.

Accordingly, I demand the BLM offer and analyze a distributed generation alternative to remote projects on public lands.

Thank you for your comment, Lorinda Wichman.

The comment tracking number that has been assigned to your comment is SEDDsupp20053.

Comment Date: January 24, 2012 18:14:50PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20053

First Name: Lorinda
Middle Initial: A
Last Name: Wichman
Organization: Board of County Commissioners, Nye County, Nevada
Address: Pahrump Office
Address 2: 2100 East Walt Williams Drive
Address 3:
City: Pahrump
State: NV
Zip: 89048
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: County Approved Comments - Supplement.pdf

Comment Submitted:

The original comments have been mailed. We are also submitting them electronically to be sure they are received prior to the deadline for comments.

Board of County Commissioners
Nye County
Pahrump, Nevada

Pahrump Office
2100 E. Walt Williams Drive
Pahrump, NV 89048
Phone (775) 751-7075
Fax (775) 751-7093

January 17, 2012

Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue
EVS/240
Argonne, Illinois 60439

Nye County respectfully submits these comments on the Solar Energy Draft Programmatic Environmental Impact Statement.

Nye County actively facilitates development of its solar resources through (1) an MOU with all four BLM District Offices, (2) by committing County resources (staff and funding) for coordination and communication with developers and local, state, and federal entities, (3) an MOU with its sister counties Inyo (California) and Esmeralda (Nevada), and (4) through the implementation of a Developer Agreement with each renewable energy developer within the County. These activities and our current planning documents for Nye County have incorporated local information and the Federal agencies should have coordinated this document with local plans under Federal Law.

The County is gravely concerned the PEIS and Supplement will undermine and even halt solar energy development in Nye County and the southwestern region at a time when development of solar resources is a priority National and States public policy. At a time of widespread high unemployment and risk to our national security due to dependence upon foreign oil, Nye County asks if the additional regulatory burden imposed by the Solar PEIS and Supplement is wise and appropriate.

We appeal to the Bureau of Land Management to consider our concerns summarized below.

- The Solar Energy Zones (SEZs) in Nevada as identified in the PEIS area based on state by state evaluations rather than regional relationships and do not match competitive resource energy zones identified by State organizations. Consequently, the PEIS SEZs do not take into account federal, state and local plans and initiatives, such as:

    a. Nevada Governor's New Energy Industry Task Force
    b. Renewable Energy Transmission Access Advisory Committee (RETAAC);
    c. Nevada Energy Assistance Corporation (NEAC) Renewable Energy Corridors,
    d. Valley Electric Association's plans to join the California Independent System Operator (CAISO) effective January, 2013;
    e. NV Energy Renewable Transmission Initiative (RTI); and

f. EPA funded Five County (Nye, Esmeralda, Lincoln, and White Pine in Nevada, and Inyo in California) Brownfields Coalition to identify potential renewable energy sites and associated transmission routes on previously disturbed lands.
g. Title 7 of the Nye County Code of Ordinances which govern Public Lands within Nye County and our interactions with Federal agencies.
h. The Nye County Comprehensive Master Plan of 2011 which identified areas of best solar suitability.

- The original Amargosa Valley SEZ was not a prime location, indicated by subsequent reduction in size and the additional studies called for in the Supplement. Nye County believes a reduction in SEZ size should be offset by identification of an alternative SEZ in the same county. (Note: alternative SEZ sites suggested and preferred by Esmeralda County were not included or addressed in either the Draft Solar PEIS or the Supplement.) If the SEZ Alternative must be adopted by BLM, Nye County has encouraged Nevada to:

  a. Actively seek the identification of new SEZs through a stakeholder process, much as California and Arizona have done;
  b. Require new SEZs be identified in conjunction with local counties' planning; and
  c. Require any currently identified disposal areas be considered equivalent to SEZs since they have already been evaluated for disposal.

- Nevada is 87% federal land and Nye County is 98% federally controlled land. If the SEZ Alternative is adopted, it is imperative for the economic viability of the County that an efficient and effective process of identification of suitable solar sites be implemented by the BLM. Review and revision of BLM Land Use/Resource Management Plans historically has taken from one and a half to seven years. Requiring new or expanded SEZs to go through the RMP process adds an additional layer to the BLM process for new development and may render development unfeasible.

- Existing solar Right of Way applications were grandfathered under the PEIS. However, if projects in those ROWs do not develop, there is no provision in the Alternative for designating those previously studied areas as SEZs or retaining them under the grandfather designation. Requiring lands having been selected through the existing right of way process to go through a variance process in order to be reselected as a SEZ will:

  a. Unnecessarily delay and therefore, discourage viable solar development;
  b. Require additional costs on the part of the applicant, making the resource less competitive; and
  c. Create redundant work for the BLM.

- The additional regulatory requirements imposed by the proposed variance process for lands not in a SEZ or Exclusion Zone will add cost and uncertainty to the development process. Nye County questions who will fund the additional studies and public meetings?

  a. BLM from its budget?

b. The State or County requesting a new or revised SEZ or change to an RMP? Local government already must pay for requesting changes to a RMP. Additional costs to local government when they request additional or revised SEZs is equivalent to an unfunded mandate.
c. The proponent/developer? Will the additional cost make the development of the project unfeasible? Will this cost be offset by some benefit to the proponent?
    i. Will the additional studies be included in subsequent NEPA work if the project is approved by BLM?
    ii. Will additional, more intensive studies be required after BLM approval of the project?

- Nevada law makes the State Engineer the final arbiter of water issues, and the Department of Energy has recognized this. Through changes in the NEPA process under the Alternative, the BLM and other Department of the Interior agencies are inserting themselves in the control of water within the state. This is a violation of state's rights and invites the possibility of lawsuits.

- Nye County believes the No Action Alternative is preferable to a plan that adds redundant regulatory requirements and increases barriers to solar development rather than solving them. Nye County recognizes that while slow, the current ROW process is working successfully.

A number of Nye County solar developers have begun looking for projects sites on private land due to the uncertainty and costliness of the proposed PEIS SEZ Alternative. For Nye County, this means solar development will go elsewhere at a time when the local community has firmly embraced the potential for job creation of this industry.

Thank you for your consideration.

Sincerely,

Andrew Barasky

FOR Lorinda A. Wichman,
Chairman

/

Standard Review Form for
Draft Solar Energy Development PEIS (Issued December 2010)

Reviewer's Name: _Richard Nelson & Erika Balderson_____ **Reviewer's Organization**: Nye County, Nevada_____

Reviewer's email address: Richard@becnv.com, Erika@becnv.com___ **Reviewer's Telephone numbers**: 702-304-9830_____

Primary Disciplinary Area (e.g., ecology, land use planning, regulatory oversight): _Regulatory Oversight_____

Section(s) or Chapter(s) Reviewed: ____All_____

EIS Section	Page/Line	Comment/Suggested Revision	Action *(for use by ANL)*
1.3 BLM's Purpose and Need	**1-3/34**	**Should be changed to read: "… on public lands with some of the highest solar insolence levels in the United States and to ensure …" The draft Solar PEIS and its Supplement tend to make it appear that solar development can take place anywhere in the six state region. It is important to note the high interest in utility scale solar development is primarily (at least in Nevada) in areas with high levels of solar insolence (7.5 to 8 kWh/square meter/day) with less than 3% change in elevation. Most public lands within the six state region do not meet these requirements and should be indicated as such.**	
1.1 Overview	**1-1/20-22**	**"Because of its programmatic nature, the Supplement analyzes environmental effects over a broad geographic and time horizon…" is incorrect as the Supplement is analyzing conditions in a snapshot in time using current planning conditions and energy goals, which could change.**	
1.3 BLM's Purpose and Need	**1-4/17**	**"Optimizing existing transmission infrastructure and corridors;" Does this mean the Department of Energy designated Section 368 Corridors and the BLM corridors will be aligned? How do BLM and DOE intend to approach potential development of DOE corridors**	

		that cross undisturbed lands and could impact currently unimpeded viewsheds?	
1.4 BLM Decisions to be Made	**1-5/23-27**	**If policy components are only provided in the Record of Decision, the public will not have an opportunity to provide input. The Record of Decision should not include new information that the public did not have an opportunity to review.**	
1.6 Status of Reasonably Foreseeable Development Scenario	**1-8/7**	**A table referenced in the text should be located in close vicinity to the text, not in another chapter. Recreate Table 2.3-1 in this section if it is going to be referenced.**	
1.8.2 Competitive Process	**1-15/18-23**	**Bonus bid competitive process or other competitive procedures – the bid process will add to the cost of development. What process will be implemented if no bids are received?**	
2.2.1.2	**2-14/7-9**	**If the plan to implement the adaptive management and monitoring strategy is included in the Final Solar PEIS, there will be no prior comment period. The plan should be subject to public comment before the release of the Final Solar PEIS if it is to follow the spirit and intent of NEPA. Will there be a specific comment period for the plan?**	
2.2.1.3	**2-14/23-24**	**The final proposed list of programmatic design features should be made available for public and industry review before being published in the Final Solar PEIS, where comments will not be considered.**	
2.2.2.2 Proposed Solar Energy Zones	**2-15/20-21**	**"...where there is good potential for connecting new electricity-generation plants to the transmission distribution system..." Current planning efforts for new and upgrading transmission distribution systems should be taken into account, otherwise ideal SEZ areas will be overlooked for potentially less viable areas, slowing and increasing the cost of development. If current planning efforts for new transmission distribution were taken into account by the BLM, it should be stated.**	

2.2.2.2 Proposed Solar Energy Zones	**2-18/20-21**	**If the BLM is going to "prioritize the collection of additional data and analysis in those SEZs that are most likely to be developed in the near future," a description of how the SEZs will be prioritized should be prepared, including the process and criteria used for prioritization. If the BLM selection criteria do not match commercial requirements, development will be delayed and additional data collection and analysis will be required. The prioritization criteria should be prepared and a public comment period allowed before the criteria are placed in the Final Solar PEIS.**	
2.2.2.2.6	**2-30/8-9**	**"The BLM has initiated efforts to consider identifying new SEZs in these states." Suggest a regional identification process to be sure possible SEZs located in more than one state are fully considered. These may be overlooked in a state level review.**	
2.2.2.2.2	**2-19/40-43**	**"Projects proposed in SEZs identified and analyzed through state or local land use planning efforts …" Since the Supplement indicates in other paragraphs (e.g., Page 2-28, line 18) the BLM is already dealing with States, what will be required of local government to have their identified SEZs be recognized by BLM? If local government, Tribes, and/or industry identifies an area for a SEZ, who will be required to conduct and pay for the evaluation of the SEZ?**	
2.2.2.2.2 Environmental Review for Projects in SEZs	**2-22/29-31**	**The statement, "…ROW authorization will require that the project POD include documentation of a completed BLM-approved cultural resources mitigation program…" seems to contradict the statement on page 2-5, line lines 12-13, "The POD must be of sufficient detail to provide the basic information necessary to begin the environmental analysis…" Clarification is needed as to whether environmental studies (which normally include cultural surveys) must be completed before a POD will be approved. Alternatively, the term "basic information" must be sufficiently well defined for parties to efficiently and effectively comply with the POD approval process.**	
2.2.2.2.3 Improve and	**2-24/ 21**	**Will regional mitigation plans include multiple states where there are similar environmental conditions, or will regional plans be strictly**	

Facilitate Mitigation		**within each state? If the plans are restricted to single states, as is indicated by the state-by-state approach taken in the PEIS, the same environmental conditions in neighboring states may be treated differently and could lead to additional legal challenges over the equal treatment of projects by BLM.**	
2.2.2.2.3 Incentives for Projects in SEZs	**2-25/11-14**	**Adding new information, such as an evaluation of the transmission needs and impact for anticipated solar development in the Final Solar PEIS will eliminate the ability of industry and the public to properly comment on the information.**	
2.2.2.2.3	**2-25/19-21**	**If BLM will offer incentives to developers to build transmission, those incentives should be listed and should be subject to industry and public comment.**	
2.2.2.2.3	**2-25/23**	**Will BLM coordinate their transmission planning existing transmission planning processes like those conducted by Western Electricity Coordination Council (WECC) and its subregional planning groups, the California Transmission Planning Group (CTPG), the California Independent System Operator (CAISO)and other planning agencies? If so, this coordination process should be clearly stated and comply with Federal Energy Regulatory Commission (FERC), North American Electric Reliability Corporation (NERC), and other relevant regulatory requirements.**	
2.2.2.2.3	**2-25/30**	**Will BLM commit staff to actively establish and support the operation of the cooperative agreements, Memoranda of Understanding and/or Agreement? Without sufficient, active support, implementation and operation of the agreements for their intended purposes is unlikely and the opportunity for their usefulness will be lost. The commitment of sufficient agency resources (initial and ongoing) should be explicitly stated.**	
2.2.2.2.3	**2-26/17-37**	**The use of the term "may" does not commit BLM to an action, and the statements imply operators will have to be enticed to use the SEZs. It would also imply the variance process is intended to punish developers for preferring alternative sites that may be more competitive (and therefore feasible) rather than using a SEZ.**	

2.2.2.2.3	**2-26/32**	**Will BLM issue specific guidance for bonding requirement restructuring so all BLM offices use the same criteria? The use of the term "may" does not assure this will happen. What circumstances will be required to be met for this to be done?**	
2.2.2.2.5	**2-28/18-21**	**"The BLM has already initiated efforts to identify new SEZs in the states …" Will there be any requirement for regional coordination and development? Regional coordination is particularly important where transmission development/upgrading issues are concerned in connection with renewable energy development and/or where local government planning is involved.**	
2.2.2.2.5	**2-28/36-39**	**How will BLM assess the need for new or expanded SEZs a minimum of every five years? Will BLM require changes to BLM processes such as Resource Management Plans and Land Use Plans in order to do this? Paragraphs 2.2.2.2.6 and 2.3.1 indicate possible SEZs must be included in those plans for them to be considered. This process should be clearly stated.**	
Figure 2.2-1	**2-29**	**Suggest panels 3 and 4 be reversed. It is preferable to identify and use previously disturbed sites, whenever possible, rather than disturb new areas. Once the previously disturbed sites have been identified, the environmental screening criteria should be applied.**	
2.2.2.2.6 Ongoing Efforts to Analyze New SEZs	**2-30/24-26**	**Clarification should be added to define which entity will be required to conduct (pay for) the NEPA analysis for SEZs "identified and analyzed through state or local land use planning efforts…" particularly since Appendix C (page C-1, lines 20-22) states, "Note that additional data and analysis will help facilitate development in SEZs but is not required to identify an area as an SEZ…"**	
2.2.2.3.1 Variance Process	**2-34/17-19**	**The statement "sufficient detail (as determined by the BLM)" should be explained in sufficient detail to allow consistent application by BLM districts and field offices, as well as state agencies, and understanding by developers.**	
2.2.2.3.1	**2-35/1-2**	**SEZs identified "through a related process such as the California DRECP or Arizona RDEP_" … "may be given status and processed as though it were in an SEZ." BLM should clarify if this would also**	

		apply to areas identified through Local or Tribal processes.	
2.2.2.3.1	**2-35/ 18 - to 2-37/18**	**Recommend Option 2 be implemented in order to provide a uniform application. However, the requirement to survey an area 3-4 times larger than the proposed project area (page 2-37, lines 6-7) should be removed. If the project area is found to be unsuitable, additional land area should be surveyed to a find suitable area. Needless surveying not only disturbs a larger area than is required, but also adds project costs that reduce the value of the resource and may make it uncompetitive.**	
2.2.2.3.1	**2-40/3-5**	**Why would pre-scoping public meetings be considered to be outside the NEPA process? These meetings appear to be scoping meetings since they define the scope of work needed to be done in the NEPA process.**	
2.2.2.3.2	**2-40/30-36**	**Since many of the actions required for variance processing are required under NEPA processing, will BLM allow actions taken under variance processing to be incorporated in subsequent NEPA activities? This should be clearly stated.**	
2.2.3	**2-41**	**The Modified SEZ Program Alternative would effectively draw out the process of identifying new SEZs, since "all areas outside of identified SEZs would be identified as exclusion areas for utility-scale solar energy development." The exclusion area designation would make it difficult for BLM to redesignate an area for priority solar development, and would appear to go against Federal Energy Policies to encourage renewable energy development to reduce green house gases and our dependence upon foreign fuels.**	
2.3	**2-42/33**	**Minimizing potential negative environmental, social, and economic impacts of renewable energy development is normally considered in the area surrounding the development. Current evaluation does not take into account the positive effects on areas that receive the energy resulting from that development, such as the lowering of emissions from fossil-fueled power plants. As such, the benefits of the development are understated in relation to possible detrimental aspects.**	

Table 2.3-2	**2-54**	**Water Resources, Paragraph 1 – The statement "… such projects would be limited primarily to locations with ample groundwater supplies where water rights and the approval of water authorities could be obtained." appears to imply BLM intends to assume the responsibilities of state water regulating agencies. At least within Nevada, the State Engineer decides water rights questions in ALL areas of the state. If water rights can be obtained from the State Engineer in any area, BLM actions to limit development based upon water would appear to violate the rights of the state contrary to current federal and state agreements. The statement should either be rewritten to comply with current legal requirements, or it should be eliminated.**	
Table 2.3-2	**2-54**	**Water Resources, Paragraph 4 – The statement should be rewritten to indicate the design features to reduce many of these impacts are already required in most legal jurisdictions and particularly in Nevada. BLM cannot operate autonomously.BLM is required to include and consider state and local requirements.**	
Table 2.3-2	**2-56**	**Wildlife and Aquatic Biota, Paragraph 1, considers the immediate impact of possible solar energy development; however, it does not consider the longer term and potentially more damaging effects of greenhouse gases resulting from continued use of fossil fuel power plants upon the atmosphere and climate. A fair analysis must include positive impacts to the environment relevant to deployment of a clean energy source that reduces the need for traditional fossil fuel generation.**	
Table 2.3-2	**2-57**	**Special Status Species, Paragraph 2, states critical habitat, ACECs, and "other areas where the BLM has made a commitment to protect sensitive species would not be excluded." The paragraph should be rewritten, since current ROW processes already exclude development in those areas and these areas may be further enlarged based upon state and local governmental agency requests and public scoping meeting results.**	
Table 2.3-2	**2-60**	**Paleontological Resources, Paragraph 1 – The statement "… impacts**	

		would be minimized due to the required variance process." should be deleted. The current process already considers the impacts, so the variance process will have little impact on this consideration.	
Table 2.3-2	**2-61**	**Cultural Resources and Native American Concerns, Paragraph 1. The statement "... impacts would be minimized due to the required variance process." should be deleted. The current process already considers the impacts, so the variance process will have little impact on this consideration. Additionally, the statement "...except there would be no explicit exclusions to avoid known sensitive cultural resources." should be deleted. BLM policy already includes this aspect and the statement implies BLM is not, in fact, currently considering known sensitive cultural resources.**	
Table 2.3-2	**2-61**	**Transportation, Paragraph 1 – the comment "... impacts would be minimized due to the required variance process." should be deleted. These impacts are already addressed in the current process.**	
2.3.1 Impacts of the Modified Solar Energy Development Program Alternative	**2-62/5-7**	**Change "... certain categories of land that are known or believed to be unsuitable ..." to read "... certain categories of land that are known to be unsuitable ..." The use of the term "believed to be" is subjective and easily challenged. More importantly, the rapid technological changes taking place make the term "believed to be unsuitable" is questionable even in the short term.**	
2.3.1	**2- 62/14-25**	**The statement "... identified as SEZs where the agency would prioritize solar energy and associated transmission infrastructure development." should be revised to say this will be done in coordination with state and regional transmission planning entities.**	
2.3.1	**2-62/30-32**	**Clarification needed. Will BLM require the frequent review/revision of land use plans to meet this requirement? Unless a specific time requirement is provided for the update/revision of land use plans, the modified program alternative will only delay the development or modification of new and existing SEZs.**	
2.3.1.1	**2-63/34-35**	**The wording "... solar energy development only where such development may be expected to encounter fewer potential resource conflicts." should be changed to "solar energy development where**	

		potential resource conflicts are offset by potential economic and infrastructure gains." Siting projects where there are few potential resource conflicts tends to locate them where they are of marginal economic value and incentives must be applied in order to try to develop them. For BLM to effectively and responsibly encourage renewable energy development, it must weigh potential conflicts against potential economic and infrastructure gains without requiring the use (and associated cost) of short and/or long term incentives from BLM and/or other governmental agencies.	
2.3.1.1	2-64/9	Change "... and address the majority of operational ..." to read "... and address the majority of currently identified operational ..."	
2.3.1.1	2-64/17-19	The statement should be deleted or rewritten. It contradicts earlier statements that the identification of new SEZs would require changes be implemented in land use and Resource Management Plans. It also implies a "one size fits all" approach to utility planning and development that has been proven to not work even in centrally controlled economies.	
2.3.1.1	2-64/21-26	Change line 25 to read "... would reduce the cost to the government (if no incentives are required), developers ..."	
2.3.1.2 Minimize Environmental Impacts	2-64/42 - 43	Change to read "... authorization policies continue the currently established requirements for coordination ..." The current statement implies BLM has not done so and has failed to meet current NEPA requirements.	
2.3.1.2	2-65/8-15	Rewrite or delete the statement. It indicates BLM has failed to meet its current NEPA requirements in dealing with renewable energy development. The proposed variance policy appears to differ from the current policy only in requiring more survey work and public meetings prior to initiation of the formal NEPA process –imposing additional cost and time for both BLM and the proponent.	
2.3.1.2	2-65/8	Change to read: "The proposed ROW exclusions would continue to avoid the impacts ..." The current statement implies BLM has failed to do so under the current process.	
2.3.1.2	2-65/17-	The bullet point should be deleted as misleading. It indicates BLM is	

	26	taking credit for limiting development to areas industry has already identified as areas of greatest interest and potential. It is also continuing the current process practiced by BLM (at least in Nevada) and is not a change.	
2.3.1.2	2-65/29	Change to read "… Solar PEIS, address the currently identified array …" The use of the term "full array" indicates no other potential impacts will be identified – even if new technology is developed with potentially unforeseen impacts.	
2.3.1.2	2-65/36-40.	Delete the paragraph. The proposed process requires industry and BLM to informally accomplish much of the ROW process prior to beginning the formal process. In doing so, its primary accomplishment appears to be the lengthening of the time and expense required for industry (and BLM) to complete the process.	
2.3.1.2	2-65/42-44	Rewrite or delete the paragraph. It indicates BLM has not provided opportunities to site projects on previously disturbed lands. If that is true, it means BLM has failed to meet its congressionally directed mandate.	
2.3.1.2	2-66/10-19	Change to read "Forthcoming adaptive management and monitoring strategies will formalize existing procedures to ensure …" and (line 13) "… developers would continue to be required to develop …" The current paragraph indicates BLM has failed to do any of the enumerated tasks under current BLM policies – which, may be true in some districts, but is definitely not true in all districts.	
2.3.1.2	2-66/25	Change to read: "The program would continue to facilitate solar energy development on BLM-administered lands and would continue to ensure development would be subjected to rigorous environmental review, including a thorough public involvement process." The current statements indicate BLM has failed to do so under the current process.	
2.3.1.2	2-67	Reword or delete footnote 5 and/or properly complete PEIS actions for the identified SEZs. The footnote is an admission that (1) the PEIS was not properly conducted (as would be required for any ROW applicant); is an admission the SEZs may require more NEPA	

		work than is indicated elsewhere in this Supplement and PEIS; and (3) indicates industry may have to expend as much NEPA effort in an SEZ as they would elsewhere.	
2.3.2.2 Minimize Environmental Impacts	2-72/41	Change to read "…would address the full array of known potential impacts …" The supplement has already indicated not all potential impacts have been fully identified.	
2.3.2.7 Meet Projected Demand for Solar Energy Development	2-75/22-23	Change to read "…lands available within the SEZs may exceed the amount of land …" It has already been said that not all land within an SEZ will be developable, based on the presence of ephemeral streams, etc., and is further noted in the paragraph beginning on line 35 of this page.	
Table 2.3-4	2-77	Facilitate near-term utility-scale development on public land, paragraph 2 – Considering the amount of federally controlled, public land compared to private land in western states such as Nevada (87% federal land), a development shift toward nonfederal lands is not a reasonable alternative. Therefore, the restriction limiting solar developers to existing SEZs unfairly restricts development in rural communities (e.g., Nye County).	
Table 2.3-4	2-78	Minimize potential social and economic impacts – prioritization of development in SEZs will have a direct, negative impact in rural areas such as Nye County. The County has a considerable amount of high priority land for solar development that is being removed from consideration under the PEIS and this Supplement. Implementation of the SEZ program will have an immediate, negative affect the number of jobs that could be available within the County from solar energy development and associated transmission development and ancillary services.	
Table 2.3-4	2-78	Provide flexibility to solar industry – for areas like Nye County, the PEIS will limit the flexibility to identify appropriate locations for utility-scale (and other) development. The County has tremendous solar potential that will be greatly limited by the PEIS SEZ program.	
Table 2.3-4	2-78	Optimize existing transmission infrastructure and corridors –	

		implementation of the PEIS SEZ program will greatly limit the opportunity to utilize existing or new transmission development since it will greatly reduce the area available for development. By effectively discouraging the upgrading or expansion of transmission infrastructure, BLM's PEIS policies will limit economic development in affected communities.	
Table 2.3-4	**2-79**	**Meet projected demand for solar energy development as estimated by the RFDS – The PEIS has pointed out not all states will have sufficient land available to enable them to meet their RFDS requirements. Their ability to meet projected demand depends upon constructing/upgrading transmission lines to deliver the needed energy from out of state renewable resources. Generation and delivery from nearby states (e.g., Nevada to California) will be necessary to provide cost effective delivery with minimal line losses. Regional planning, rather than state by state planning, will be required to efficiently meet that need.**	
2.4.2 National Historic Preservation Act	**2-81/41**	**National and draft Solar PAs are mentioned with no description of what PA stands for. This should be spelled out in the sentence and in the Acronyms and Abbreviations.**	
2.4.2	**2-81/45 to 2-82/4**	**The draft Solar PA was sent to SHPOs, the ACHP, Indian Tribes, and interested parties such as the National Trust for Historic Preservation. Will it be sent to all stakeholders for comment or only to those already enumerated?**	
3.2.4 Water Resources and Erosion Control	**3-3**	**Over-appropriation or over-drafting of any groundwater basin is a consideration for everyone. However, state law and state-federal agreements must be acknowledged (e.g., by state law and state-federal agreements, the Nevada State Engineer is responsible for identifying water rights, over-appropriation/drafting of basins, not DOE or BLM). Failure to recognize and acknowledge this would be an abrogation of states' rights and federal agreements.**	
3.2.10 Environmental	**3-6/41**	**Add: "Where applicable, work with potentially affected low-income and minority communities to develop job training skills to enable**	

Justice		**community members to obtain good paying jobs and other positive results from renewable energy development." Results from an action can be both positive and negative, and comments should reflect this.**	
Appendix C	**C-2/ Table C.1**	**A footnote should be added to explain the acreage differences given for the Revised Area To Be Carried Forward and the Revised Developable Area in the table is for Non-development acres within the Developable area, as stated in Figure C.4.1-2.**	
C.4.1.1	**C-147**	**If the size of the SEZ is reduced, Nye County should be consulted and consideration given to developing a SEZ in another area of the County as part of this PEIS. The arbitrary reduction of the SEZ due to potential ecological impacts adversely affects economic development within the County and should accordingly be considered.**	
C.4.1.1	**C-147/23**	**Only potentially adverse impacts are identified in this section. An unbiased, accurate description of the environmental impact of an action requires ALL impacts be described and discussed – including potential positive impacts or benefits of the action, activity, or development, in accordance with the spirit of NEPA.**	
C.4.1.1	**C-147/25-C-150/13**	**Potential impacts should be the basis for requiring further study to determine the probability of an effect, not for making decisions based on an undetermined potential.**	
C.4.1.2 Summary of Comments Received	**C-150/32-33**	**The U.S. Fish and Wildlife Service recommended the SEZ be reconfigured to address potential impacts. Potential impacts should be the basis for further study, not for changing the configuration of the SEZ.**	
C.4.1.2	**C-150/34-35**	**The Nevada Department of Wildlife recommended the portion of the Amargosa Valley SEZ north and east of highway 95 be removed, with no listed reason(s) for doing so. An explanation should be provided as to why the area should be removed.**	
C.4.1.3 Changes to the SEZ	**C-151/23-26**	**Elimination of a floodplain from the SEZ would appear to be reasonable. However, elimination of an area to "mitigate many potential impacts" without documented study to determine the actual level of impact appears to indicate the elimination was based on**	

		supposition rather than fact. Further study should be required to determine if those potential impacts warrant revising the SEZ.	
C.4.1.3	C-151/38-41	Nevada law and federal-state agreements identify the Nevada State Engineer as the final decision authority for water rights and water allocation within the state. Restrictions based upon the availability of water or water rights without the State Engineer's agreement would constitute a violation of states' rights. Changes to the SEZ for these reasons should be based upon consultation with the State Engineer to avoid possible legal actions at a later date.	
C.4.1.3	C-151/43-46	"Extensive potential impacts" without study to determine the actual probable level of impact should not be the basis for not accepting applications. Further study should be required before decisions are made, or the full rationale for those decisions should be provided. Decisions made without conducting required studies and/or providing the underlying rational appear to be biased and/or arbitrary.	
C.4.1.3 Changes to SEZ	C-152/ Figure C.4.1-2	The BLM needs to specify if Non-development acres within an approved SEZ will be included in determining lease payments. It should also be explained as to why the Non-development acres were not designated exclusion zones.	
C.4.1.5 Additional Data Collection Recommended	C-153	It should be clarified who the responsible parties are for the additional data collection. Will the recommended data collection be done by the BLM as an incentive for SEZ development?	
C.4.1.5.2	C-153/18-19	If the original area of the SEZ was reviewed and found to not have wilderness characteristics, what is the rationale for re-evaluating the revised SEZ? A re-evaluation does not appear to be warranted since the SEZ area was reduced and no new land was included in it.	
C.4.1.5.5 Military and Civilian Aviation	C-153/33-44	Nye County strongly supports Nellis AFB and military training/operations. However, determination of which technology is appropriate should be based upon actual studies, not upon supposed potential impacts.	
C.4.1.5.8 Water	C-154/45	Add: "- Work with Nye County and the DOE Nevada National	

Resources		**Security Site to utilize information through their ground water monitoring wells and numerical groundwater models in the Amargosa Valley and adjacent basins.** **- Coordinate the development of additional models and monitoring wells with both DOE and Nye County."** **Nye County has both a direct interest in and an existing, active scientific program for groundwater monitoring and modeling in the area and can provide valuable input to BLM and USGS-NV studies.**	
C.4.1.5.8	**C-155/11**	**Add: "- Coordinate information developed regarding modeling analyses, the use of DVRFS model, and potential impacts to groundwater relevant to Ash Meadows National Wildlife Reserve, Devils Hole, and Amargosa Valley."** **Nye County has both a direct interest in, and an existing, active scientific program for groundwater monitoring and modeling in the area and can provide valuable input to BLM and USGS-NV studies.**	
C.4.1.5.8	**C-155/12**	**Add: "- Coordinate all activities, groundwater modeling analyses, and monitoring results with the Nevada State Engineer who is the final arbiter of water rights and issues in the state.**	
C.4.1.5.9 Ecological Resources	**C-155/13**	**The Right of Way applicant normally accomplishes the additional data-gathering actions described in this section during their NEPA work. If the described studies are accomplished under the PEIS, will the studies be sufficiently detailed that the developer will not have to conduct additional studies? If the developer will be required to do additional studies, it would appear to be more cost effective for both BLM and the developer if the developer did all of the studies in this section.**	
C.4.1.5.11	**C159/9**	**The Right of Way applicant normally accomplishes the additional data-gathering actions described in this section during their NEPA work. If the described studies are accomplished under the PEIS, will the studies be sufficiently detailed so the developer will not have to conduct additional studies? If the developer will be required to do additional studies, it would appear to be more cost effective for both BLM and the developer if the developer did all of the studies in this**	

		section.	
C.4.1.5.13	**C162/28**	**The Right of Way applicant normally accomplishes the additional data-gathering actions described in this section during their NEPA work. If the described studies are accomplished under the PEIS, will the studies be sufficiently detailed that the developer will not have to conduct additional studies? If the developer will be required to do additional studies, it would appear to be more cost effective for both BLM and the developer if the developer did all of the studies in this section.**	
C.4.1.5.14	**C-162/38**	**The Right of Way applicant normally accomplishes the additional data-gathering actions described in this section during their NEPA work. If the described studies are accomplished under the PEIS, will the studies be sufficiently detailed that the developer will not have to conduct additional studies? If the developer will be required to do additional studies, it would appear to be more cost effective for both BLM and the developer if the developer did all of the studies in this section.**	
C.7.1.3.1	**C-328/26-45**	**Consideration should also be given to development in rural areas that is restricted by limited transmission capacity and the cost of upgrading transmission lines. Upgraded or new transmission for SEZs will also allow other economic development. Additional development may change the required electrical load in the areas where insufficient available power previously limited opportunities. Currently projected load levels may not be accurate for these reasons and this must be taken into account. In addition, the reduction of solar (and other renewable energy) generation costs and energy intermittency may result in an increased use of renewable energy beyond the current RPS requirements – unless artificial limits are applied. Current Right of Way applications have already shown development will take place only if the market shows development to be economically feasible.**	
C.7.1.3.1 Implementation	**C-329 /34**	**Add: "Avoid the use of existing transmission lines of historical significance that might otherwise be eligible for upgrading, and/or**	

		those which pass through environmentally sensitive areas where the cost of upgrading would exceed that of new transmission line construction.	
C.7.1.3.2 Transmission Analysis Methodology	**C-330/26-28**	**An additional consideration for potential spare capacity is capacity limited by contractual availability. The spare capacity is available only if the entity having contracted for that capacity is willing to allow it to be used – the amount of wheeling charges incurred will often determine if it is economically feasible for the generator to use it.**	
C.3.7.2.2 Floodplain Determinations	**C-340**	**BLM should specify the agency or entity responsible for completing and funding the additional analysis. For example, will the BLM update flood plain delineations on BLM managed lands, or will FEMA be expected to do so. The floodplain determinations could have a large impact on development timelines and agency funding requirements and ultimately economic feasibility of a project.**	
C.7.2.3 Jurisdictional Waters Determinations	**C-341/18-29**	**Considering the current budgetary situation, what time frame will be required to obtain the jurisdictional decisions, and which agency(s) will be funding this? Will decisions be held up until the determinations are made? What effect will this have on developmental time lines? For development to occur, it is imperative this type of uncertainty be resolved.**	
C.7.2.4 Significant Ephemeral Waters Determination	**C-341/32-44**	**The state of Nevada requires development be done in such a manner that stakeholders downstream of the development see little or no change in groundwater flows. Will that be sufficient to meet the requirements of this paragraph?**	
C.7.2.5.1	**C-342/16-19**	**Will BLM fund the monitoring programs? This should not be an unfunded mandate levied upon state and local governmental agencies.**	
C.7.2.6 Modification of Design Features	**C-343/1-4**	**The level of required groundwater analyses should be based on the quantity of water used, not on the technology employed. This approach would apply the same criteria to all forms of development since the various technologies are undergoing changes in the amount**	

		of and way resources are used.	
C.7.3 Visual Resource Design Features for Select SEZs	**C-344/12-13**	**Suggest this be reworded to say "No vertical development over 100 ft (30.5 m), including transmission towers and other structures except where safety and/or ground disturbance considerations may dictate otherwise." Limiting transmission lines to a maximum of 100 feet will necessitate more transmission poles/towers and increase the amount of land disturbance. In some areas, limiting the height of transmission lines may also incur a much greater safety issue for construction and maintenance personnel (e.g., crossing rivers and washes, etc.).**	
Appendix D: Proposed Identification Protocol for New Solar Energy Zones	**D-1/19-21**	**In earlier chapters, it was indicated new SEZs would have to be included in Resource Management and Land Use Plans, which are only updated periodically. Does the phrase "… undertaken at the state or field office level as an individual land use planning effort …" mean a new or expanded SEZ that is not already shown in an existing Regional Management or Land Use Plan will be undertaken if requested by state or local government?**	
Appendix D	**D-1/24-26**	**The sentence implies new or expanded SEZs are primarily a governmental policy decision that takes into consideration the existing solar market conditions. When does future planning come into play? It was the sudden change in "existing solar market conditions" that lead to the development of the PEIS. If new or expanded SEZs are not considered and planned for in advance of the need, the BLM may delay development rather than facilitate it.**	
D.1 Assess the Need for New SEZs	**D-2/24-27**	**Local governments frequently have more to do with attracting and gaining new economic development in an area than does the state government, which is more concerned with establishing the overall conditions for that development. As such, local government should be included in the assessment of need at least as much as state-based scenarios that may not reflect the current situation due to the rapid pace of changes possible in progressive local areas. The need for maintaining current jobs and developing new ones is critical to local government officials and must be considered by BLM.**	

D.2.4 Load Areas to be Served	**D-4/6-10**	**The term "adjacent state" may have more than one meaning when providing energy to another area. For example, the TransWest Express transmission project (partially owned by the Western Area Power Administration) will provide Wyoming wind energy to Las Vegas and California. In that sense, the transmission determines the market, not the generator location. A definition of how the term "adjacent state" is being applied should be added.**	
D.3.1 Program Exclusion Criteria	**D-5/16**	**Change "… certain categories of land that are known or believed to be unsuitable …" to read "… certain categories of land that are known to be unsuitable …" The use of the term "believed to be" is subjective and easily challenged. More importantly, the rapid technological changes taking place make the term "believed to be unsuitable" questionable even in the short term.**	
D.3.3 Additional Locally Relevant Screening Criteria	**D-6/6-9**	**Will public outreach meetings be held to discuss agency desires prior to the development of "agreements not to locate SEZs near specific units, based on an agency's assessment of potential adverse impacts on those units"? Likewise, discussions with state and local governments should be conducted prior to the decision to eliminate an area from consideration for an SEZ. Considerations of jobs and economic or other development may affect state and local governments in a manner not experienced or considered by a federal agency.**	

To add addition boxes, press tab.

Thank you for your comment, Jack Caswell.

The comment tracking number that has been assigned to your comment is SEDDsupp20055.

Comment Date: January 25, 2012 15:55:32PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20055

First Name: Jack
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Last Name: Caswell
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Address 2:
Address 3:
City: Sacramento
State: CA
Zip: 95834
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Please disregard the Draft Solar PEIS Comment SEDDsupp20054 and refer to the following comment.

It will be paramount that the BLM select a competent Independent Third Party construction inspection/plan review and environmental mitigation monitoring Delegate as early in the Right-of-Way (ROW) Permitting Review Process as possible. This should be accomplished no later than 6 months prior to the project's ground breaking activities. This will allow the Bureau of Land Management's Independent Third Party Delegate, the BLM and Project Owner and it's Development Team to hold pre-construction meetings in order to fully understand the construction impacts and the construction mitigation measures being imposed in the ROW permit to include the timing to satisfy those mitigation measures.

Thank you for your comment, Chuck Huckelberry.

The comment tracking number that has been assigned to your comment is SEDDsupp20056.

Comment Date: January 25, 2012 16:00:24PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20056

First Name: Chuck
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Last Name: Huckelberry
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City: Tucson
State: AZ
Zip: 85701
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: solar-BLM energy supplemental draft programmatic EIS 1_12.pdf

Comment Submitted:

COUNTY ADMINISTRATOR'S OFFICE
PIMA COUNTY GOVERNMENTAL CENTER
130 W. CONGRESS, TUCSON, AZ 85701-1317
(520) 740-8661 FAX (520) 740-8171

C.H. HUCKELBERRY
County Administrator

January 25, 2012

Solar Energy Draft Programmatic EIS
Argonne National Laboratory
9700 South Cass Avenue – EVS/240
Argonne, Illinois 60439

Re: **Comments on the Bureau of Land Management (BLM) and US Department of Energy Supplement to the Draft Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States**

To Whom It May Concern:

I applaud the Bureau of Land Management's (BLM) and Department of Energy's responsiveness to comments on the Draft PEIS with the new information and modifications that have been incorporated into this Supplement. You have increased the public's ability to assess the ramifications of the proposed Solar Energy Development, both in intent and implementation. Such supplements, in my opinion, are not used frequently enough.

Similarly, we support BLM's renewed focus on the Solar Energy Zones (SEZ), as the County supports this alternative. The SEZ alternative identifies areas of minimal resource conflict and highest potential for solar energy production, while concentrating impacts within a zone, as opposed to the Solar Development Program alternative, where development would create impacts throughout a very dispersed land base.

Enclosed please find the County's comments on specific aspects of the Draft PEIS and the Supplement. I would also like to restate the comments Pima County previously provided on the Draft PEIS (attached) wherein we expressed concerns for certain BLM lands within Pima County (see Attachment 4). As the BLM properties in Pima County have not changed, our concerns remain the same. While the Supplement's Preferred Alternative makes it clear that utility scale projects on these lands will be subject to project-specific National Environmental Policy Act (NEPA) analysis where impacts have not been

addressed by the Draft PEIS, this commitment does not facilitate compliance with local regulatory requirements which better reflect local issues and preferred solutions to those issues, while the Supplement specifically states that BLM will seek input from and coordination with local government entities and that projects will "be required to comply with NEPA and all other applicable laws, regulations, and policies at the applicant's expense", it does not reach the level of surety that local authorities, such as Pima County, are seeking. I would, therefore, respectfully request that BLM's issuance of the Notice to Proceed, as discussed on Page 2-9, be modified to (1) mandate that the holder be subject to and must comply with all applicable regulatory requirements of the local jurisdiction; and (2) that issuance of the Notice to Proceed could be delayed pending completion of a requirement(s) imposed by another federal, state, and/or local entity.

There is also a subset of BLM lands within Pima County included in the Preferred Alternative that should be excluded from the potential of utility scale solar development. The Draft PEIS identifies these properties as Nos. 15, 16, 25, and 26. Pima County currently holds the grazing leases on all four of these properties; all are inholdings within large areas controlled and managed by Pima County for purposes of open space preservation and natural resources conservation (see Attachment 3). These areas were secured with monies from a 2004 voter-approved $175 million open space bond fund. Development of these four properties, in particular, would fragment the resources of the surrounding open space lands controlled by Pima County as well as negatively impact the public's investment in local conservation initiatives. We request that the Final PEIS Preferred Alternative exclude these four aforementioned properties.

We are encouraged that the Solar Energy Development program will incorporate the Arizona Restoration Design Energy Project (RDEP) wherein local undertakings such as Pima County's and the City of Tucson's solar energy development efforts can be included. We look forward to the release of the RDEP Draft PEIS.

Sincerely,

C.H. Huckelberry
County Administrator

CHH/dr

Attachment

c: The Honorable Chairman and Members, Pima County Board of Supervisors
John Bernal, Deputy County Administrator for Public Works
Linda Mayro, Director, Sustainability and Conservation Office
Robin Johnson, Sustainability Manager, Sustainability and Conservation Office
Sherry Ruther, Environmental Planning Manager, Sustainability and Conservation Office
Betty Stamper, Central Permits Supervisor, Development Services
Diana Durazo, Special Staff Assistant to the County Administrator

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C.H. HUCKELBERRY
County Administrator

May 2, 2011

Solar Energy DRAFT Programmatic EIS
Argonne National Laboratory
9700 South Cass Avenue – EVS/240
Argonne, Illinois 60439

Re: **Scoping Comments on BLM and Department of Energy Solar Energy Development Draft Programmatic EIS**

To Whom It May Concern:

The Bureau of Land Management's (BLM) efforts in furthering solar energy development and improving current renewable energy policies are important steps forward in our collective objective to develop and use more renewable energy resources. For our part, Pima County has consistently supported renewable energy projects, but not at the expense of unnecessary fragmentation of our fragile desert resources or undesirable impacts to community residents. In our review of the BLM and Department of Energy's Solar Energy Development Draft Programmatic EIS, Pima County is concerned about the proposed siting of solar development within Pima County and the process undertaken so that development of renewable energy resources undergo a comprehensive study of the environment and should not compromise existing natural resources. We believe that by maintaining an inclusive public process during this EIS review and a thoughtful consideration given to comments, a balance can be achieved. After reviewing the above-referenced EIS and programmatic alternatives for utility-scale solar energy development, Pima County offers the following comments.

BLM Proposed Alternatives

The County has two underlying concerns with the EIS as presented. The first relates to the percentage attributed to solar energy development on public lands. We question the appropriateness of the BLM's assumption that public lands will provide 75 percent of the lands available for utility-scale solar development. Unless public lands are mandated to

bear the majority of the burden for solar energy development, the public/private responsibility should be more equitably partitioned. The second general concern is the lack of consideration of the potential infrastructure impacts associated with transmitting and connecting to the power grid from the various possible locations proposed under both alternatives.

As for the proposed action alternatives proposed, the County reviewed and offers comments on both. However, our most specific comments are on the Preferred Alternative as there are no Solar Energy Zones proposed in Pima County.

Solar Energy Zones (SEZs) Alternative

The concept behind Solar Energy Zones is sensible. This alternative is a step in the right direction in that it identifies areas of minimal resource conflict and the highest potential for solar energy production. If located in close proximity to transmission connections, impacts can be geographically limited within the SEZs, greatly minimizing potential adverse impacts, and giving the solar development community more certainty in where to locate without unexpected obstacles or the types of opposition described in the public hearings in Phoenix and Tucson on similar local projects. Key to this process is the inclusion of all jurisdictions, including local governments, at the beginning of the EIS process.

Regarding the estimated 214,000 acres needed under the reasonably foreseeable solar energy development scenario (RFDS) there is concern that the SEZ Alternative will not provide enough land. According to the draft EIS, however, if the need for additional land arises in the future, or new information becomes available, BLM can expand, add, reduce, or remove SEZs through a land-use planning and environmental analysis process to accommodate the need. Additionally, the BLM Arizona Restoration Design Energy Project EIS is currently looking at identifying areas across the state that may be suitable for development of renewable energy and to develop a set of environmental protection measures for these projects. This exercise is focusing on lands that have been previously disturbed or developed across Arizona regardless of whether the land is publicly or privately owned. These disturbed lands can include retired agricultural fields, landfills, old mine sites and brownfields, which provide lands that can be prioritized or fast-tracked for development given their disturbed state, as opposed to developing on pristine (i.e. previously undisturbed) land. The Restoration Design Energy Project EIS needs to inform the Draft Programmatic EIS for the State of Arizona.

Once specific project areas within SEZs are identified and evaluated on the project-scale, vetted through the public process and comprehensively assessed for potential environmental conflicts, the SEZ Alternative is more likely to meet the objectives of the Programmatic EIS than the proposed Preferred Alternative.

BLM's Preferred Alternative - Solar Energy Development Program

This alternative would potentially allow utility-scale solar energy development facilities on BLM lands scattered across approximately 4.5 million acres in Arizona, with 100,000 acres in Pima County, allowing for the possibility of more widespread impacts and less certainty for the solar energy development community and other stakeholders. Considering that the RFDS estimates that the solar generation over the 20-year study period for the six states would be about 24,000 megawatts, with a use of approximately 214,000 acres, the Preferred Alternative, as proposed, goes well beyond a reasonable accounting of lands necessary for solar energy development. The scale alone is so large that it prohibits any meaningful analysis of the potential scope of impacts to the environment and surrounding communities.

The County's assessment of the lands subject to the Solar Energy Development Program Alternative within Pima County applied five evaluation criteria (see Attachment 1). These criteria are the same measures we consistently use to evaluate other development projects proposed in Pima County. The five criteria used are:

1. *Maeveen Marie Behan Conservation Lands System (CLS)* – Since 2001, the CLS has served as the foundational cornerstone to land-use decisions and planning in Pima County. The CLS was the result of an extensive science-based, peer-reviewed process that identifies the relative value of lands throughout the County with regards to key biological values such as biological diversity and locations of sensitive species and other resources. There are multiple categories that describe these resources, with Important Riparian Areas, Biological Core Management Areas and Special Species Management Areas (see Attachment 2) having the highest resource values. In our analysis of the preferred alternative, we excluded all proposed solar energy sites that fell within these three areas and provided cautionary status to sites within other CLS categories, such as Multiple-Use Management Areas.

2. *Floodplain Management* – The Pima County Regional Flood Control District (RFCD) is responsible for ensuring that development activities that cannot be located to avoid the active floodplain are protected from flooding and do not cause adverse impacts to others. Proposed development sites are routinely evaluated for their potential to impact regulated riparian habitats, including Important Riparian Areas, FEMA floodplains, floodways, sheet flooding and local flow corridors.

3. *Historic and Cultural Resources* – Pima County has a strong Cultural Resources Conservation Program, whose primary responsibilities are to ensure that proposed development actions meet or exceed applicable laws, including County-specific policies and requirements. Lands affected by the PEIS within Pima County were evaluated according to their relationship to county-designated Archaeological

Sensitivity Zones, National Register-listed Properties and Districts, and the latest GIS information showing AzSite archaeological site polygons.

4. *Relationship to Existing County Preserves* – The County has a long history of acquiring lands for conservation. Since 1975, voters in Pima County have approved bond funding for the purpose of conservation acquisitions. More recently in 2004, voters approved $164 million to fund for the acquisition of conservation and open-space lands. Attachment 3 shows all County-owned conservation and open-space lands, County-held State grazing leases and BLM grazing permits associated with the fee title lands held by Pima County. The local BLM office is an active partner with the County on property management. With regards to the preferred alternative, Pima County is strongly opposed to these BLM lands being subject to solar development. These BLM lands, along with associated State and fee-title lands held by Pima County are being managed for species conservation as part of Pima County's forthcoming Endangered Species Act Section 10(a) permit.

5. *Proximity to Existing or Proposed Development* – The location of solar facilities close to existing development poses potential air quality and other public nuisance problems. Clearing large areas of land for construction of a project can lead to significant neighborhood impacts, including fugitive dust problems both at the time of construction and post construction. Therefore, lands affected by the PEIS lying within Pima County were evaluated for their proximity to existing developments.

Attachment 4 depicts the results of the criteria assessment of those lands within Pima County affected by the PEIS on a parcel-by-parcel basis. We recommend BLM exclude from further consideration those parcels shown in red. We further request that any future changes to the Alternatives in the EIS include the five criteria listed above when identifying lands in Pima County.

Conclusion

It is difficult to understand how two alternatives that are intended to provide a viable response to fulfilling the need for solar energy development can conclude such disparate acreages: across the same six western states 22 million acres are identified under the Preferred Alternative (4.5 million acres in Arizona) and 677,000 acres under the Solar Energy Zones Alternative (13,000 acres in Arizona). Perhaps a third action alternative is merited, or an additional clause to the Solar Energy Zone Alternative, whereby flexibility is afforded to BLM to consider land exchanges with local governments that have identified lands appropriate for solar energy development in exchange for sensitive BLM lands.

Pima County is currently developing specific location criteria to better identify and analyze potentially suitable solar sites as part of the Solar America Communities grant with the City of Tucson and the Department of Energy. Some of these sites appear to be sizeable enough to accommodate utility-scale solar facilities. Approximately 2,100 acres were

identified as potential solar sites for inclusion in Renewable Energy Incentive Districts (REIDs), with the largest parcel being 1,000 acres. We expect to complete this process shortly, with the possibility of identifying more suitable lands, and would be more than willing to make the results and criteria available to the BLM.

I cannot over-emphasize the importance of coordinating with Pima County and other local entities for reviews and input at the beginning of the application review process. There are options and opportunities that can be explored early in the process if local governments and entities are included in advance. We encourage the BLM to incorporate the multiple efforts, such as the Arizona Restoration Design Energy project and the Pima County and City of Tucson solar energy development efforts, into the solar energy development draft programmatic EIS.

Thank you for the opportunity to comment on this important effort.

Sincerely,

C.H. Huckelberry
County Administrator

CHH/dr

Attachments

c: The Honorable Chairman and Members, Pima County Board of Supervisors
John Bernal, Deputy County Administrator for Public Works
Nanette Slusser, Assistant County Administrator for Public Works Policy
Nicole Fyffe, Executive Assistant to the County Administrator
Carmine DeBonis, Jr., Director, Development Services Department
Ursula Kramer, Director, Environmental Quality
Linda Mayro, Director, Science and Conservation, Cultural Resources and Sustainability Office
Arlan Colton, Director of Planning Division, Development Services Department
Diana Durazo, Special Staff Assistant, County Administrator's Office
Robin Johnson, Environmental Specialist, Environmental Quality
Betty Stamper, Central Permits Supervisor, Development Services

Attachment 1

Assessment Methodology for BLM Solar PEIS Preferred Alternative Properties Occurring in Pima County

	Not Acceptable for Utility-Scale Development	**Maybe Acceptable** for Utility-Scale Development Pending Further Project-Specific Evaluations
CLS	Biological Core, IRA, SSMA,	Multiple Use, Agricultural In-Holdings in CLS, Outside CLS
Proximity to County Preserve Lands	Site is within a County Preserve	Site is within ½ mile of County Preserve
Cultural & Archaeological Resources	Located within a High Archaeological Sensitivity Zone	Located within a Medium or Low Archaeological Sensitivity Zone
Proximity to Occupied/Planned Development	Many residents within ½ mile; not suitable for large scale site clearing	Few to no residents within ½ mile; fugitive dust mitigation likely.
Floodplains/Water-courses	Site contains Important Riparian Area, FEMA Floodplain, Floodway or local Flow corridor which impacts a significant portion of the parcel	Site contains Important Riparian Area, FEMA Floodplain, Floodway or local Flow corridor which impacts only minor portion of the property and avoidance is possible, OR site contains sheet flooding, OR Site may contain xeroriparian habitat, but avoidance is possible

Attachment 2

BLM Administered Lands Being Analyzed for Solar Development as Compared to the CLS

Legend

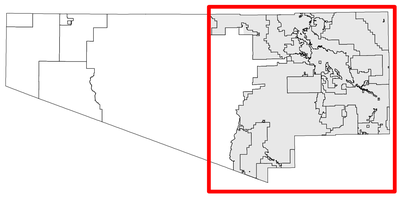
- BLM Solar Development Alternative
- BLM No Action Alternative

Conservation Lands System

- Agriculture Inholdings Within CLS
- Biological Core Management Areas
- Important Riparian Areas
- Multiple Use Management Areas

NOTE:
1. There are no Solar Energy Zones (SEZ) within Pima County
2. The lands available under NO Action also include the Solar Development Alternative

Pima County Index Map



Index Map Scale 1:1,500,000 for Arch E Print

Map Scale 1:150,000 for Arch E Print

0 2.5 miles

GEOGRAPHIC INFORMATION SYSTEMS
Pima County Information Technology Dept.
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APR 19, 2011

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Attachment 3

Pima County Conservation Acquisitions as of April 2011

CARPENTER RANCH
TORTOLITA MOUNTAIN PARK
IRONWOOD FOREST NATIONAL MONUMENT
MARANA
ORO VALLEY
CATALINA STATE PARK
BINGHAM-CIENEGA NATURAL PRESERVE
SIX BAR RANCH
CORONADO NATIONAL FOREST
A-7 RANCH
SAGUARO NATIONAL PARK TUCSON MOUNTAIN DISTRICT
TUCSON MOUNTAIN PARK
TUCSON
SAGUARO NATIONAL PARK RINCON MOUNTAIN DISTRICT
PASCUA YAQUI TRIBE
BUCKELEW
TOHONO O'ODHAM NATION San Xavier District
COLOSSAL CAVE MOUNTAIN PARK
CIENEGA CREEK NATURAL PRESERVE
BAR V RANCH
EMPIRITA RANCH
KING 98 RANCH
COYOTE MOUNTAIN WILDERNESS AREA
DIAMOND BELL RANCH
SAHUARITA
SANTA RITA EXPERIMENTAL RANGE AND WILDLIFE AREA
CORONADO NATIONAL FOREST
BABOQUIVARI PEAK WILDERNESS AREA
MARLEY RANCH
CANOA RANCH
LAS CIENEGAS NATIONAL CONSERVATION AREA
CLYNE RANCH
SANDS RANCH
BUENOS AIRES NATIONAL WILDLIFE REFUGE
RANCHO SECO
SOPORI RANCH
CORONADO NATIONAL FOREST
CORONADO NATIONAL FOREST

TOHONO O'ODHAM NATION

10 77 86 19 10 210 83 286

County Owned in Fee Simple - 91,750 Ac.

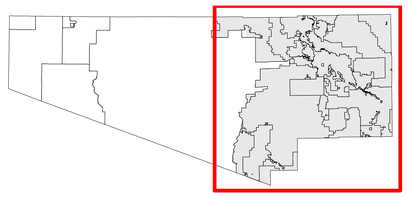
County Managed Grazing Leases
130,430 Ac.

BLM Grazing Permits - 6,900 Ac.

State Grazing Leases - 123,530 Ac.

Marley Acquisition - 105,790 Ac.
(Options Purchased for Phases 2 & 3)

Pima County Index Map



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N

Map Scale 1:150,000 for Arch E Print

0 5 miles

THE SEAL OF PIMA COUNTY ARIZONA

APR 13, 2011

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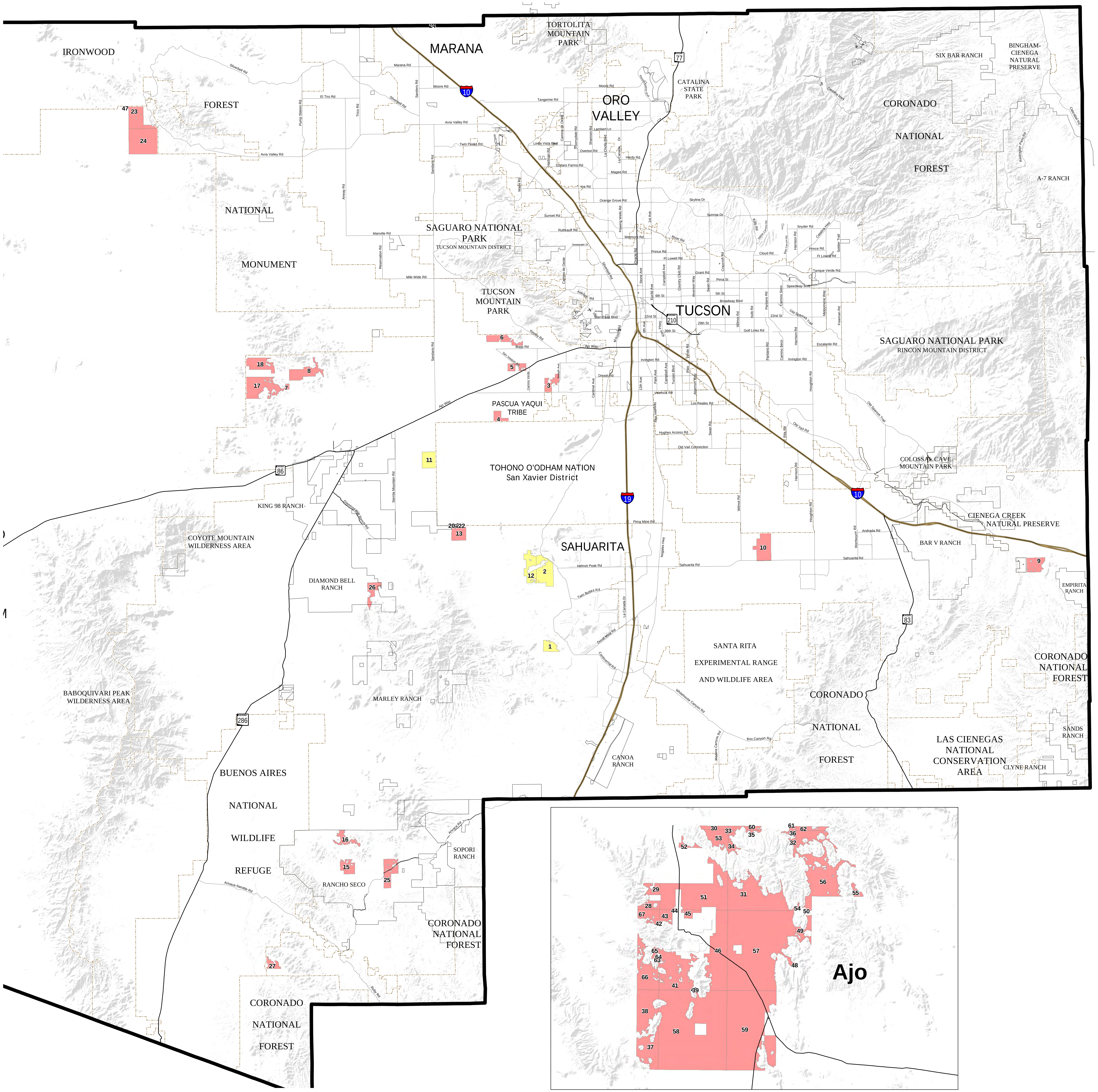
Attachment 4

BLM Solar Development Alternative Acceptability Determination

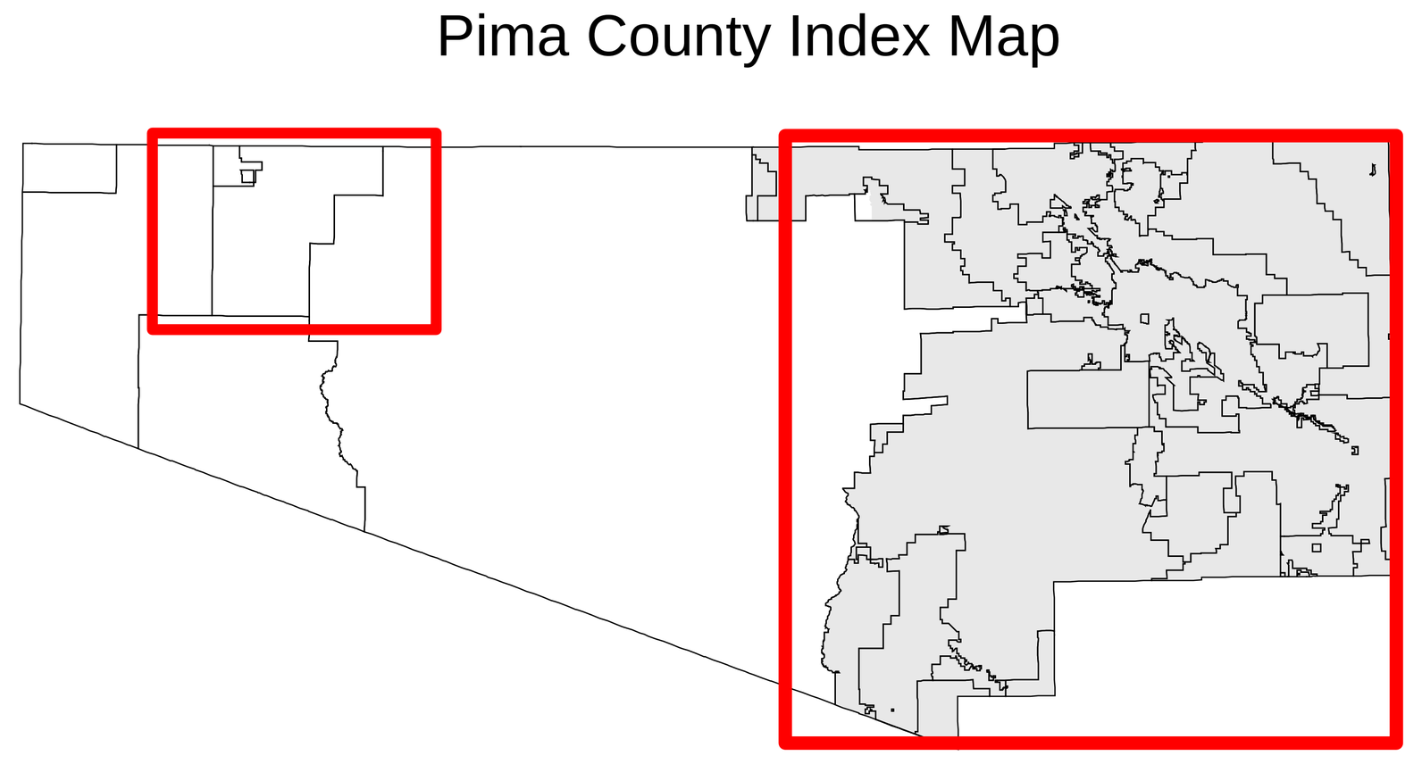


- Interstate Highway
- State Highway
- Major Streets
- Administrative Boundaries

BLM Solar Development Alternative Determination

- Maybe Acceptable
- Not Acceptable

Pima County Index Map



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0 4 miles

THE SEAL OF PIMA COUNTY ARIZONA

4/20/2011

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Thank you for your comment, Thane Somerville.

The comment tracking number that has been assigned to your comment is SEDDsupp20057.

Comment Date: January 25, 2012 17:04:37PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20057

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Middle Initial: D
Last Name: Somerville
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City: Seattle
State: WA
Zip: 981041509
Country: USA
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Attachment: Comments on Supplement to Draft Solar PEIS 012512.pdf

Comment Submitted:

These comments are submitted on behalf of the Quechan Tribe of the Fort Yuma Indian Reservation. See attachment.

LAW OFFICES
MORISSET, SCHLOSSER, JOZWIAK & SOMERVILLE
A PROFESSIONAL SERVICE CORPORATION

REBECCA S. JONES (WA)
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January 25, 2012

Submitted online at http://solareis.anl.gov
and via First Class Mail

BLM Solar PEIS Project Manager
c/o Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue – EVS/240
Argonne, Illinois 60439

Re: Comments of Quechan Indian Tribe on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

Dear BLM Solar PEIS Project Manager:

On behalf of the Quechan Tribe of the Fort Yuma Indian Reservation, we submit the following comments on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (Supplement). As described in more detail below, the Supplement fails to adequately address the Tribe's concerns expressed in its comment letter on the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (Solar PEIS), dated March 7, 2011. The Tribe incorporates its prior comments by reference.

I. Interest of the Quechan Indian Tribe

The Quechan Tribe's Fort Yuma Reservation at its current site was established in 1884 as a permanent homeland for the Quechan people. The Tribe's traditional lands extend well beyond the boundaries of the present day Fort Yuma Indian Reservation, however. Historically, the northern territory extended to the vicinity of Blythe, California, the southern territory reached to Sonora, Mexico, the western territory extended to California's Cahuilla Mountains, and the eastern territory approached Gila Bend, Arizona. The lower Colorado River tribes, which include the Quechan, moved up and down the Colorado and Gila rivers, utilizing the banks and floodplain on both sides of the rivers for subsistence and settlements throughout their history. (Alfonzo Ortiz, *Handbook of North American Indians*, Volume 10, Southwest (Quechan) (Smithsonian Institution, Washington D.C. 1982). Certain lands identified or proposed for solar development in Arizona and California fall within the Tribe's traditional territory.

Solar energy development on BLM lands directly affects the Tribe. As you know, the Tribe was engaged in litigation against the Department of the Interior based on Interior's unlawful approval of the Imperial Valley Solar (IVS) project on lands within the traditional territory of the Tribe that contain sensitive cultural and natural resources of signficance to the Tribe. *See Quechan Tribe of the Fort Yuma Indian Reservation v. United States Department of the Interior*, 755 F. Supp. 2d 1104 (S.D. Cal. 2010). On December 15, 2010, the Court preliminarily enjoined construction of the IVS Project due to Interior's failure to comply with applicable law. In addition to the Tribe's challenge of the IVS project, there have been many other legal challenges to solar projects approved by Interior under the arbitrary "fast-track" program. Concerns about impacts to cultural resources are prevalent in these cases.

Disputes have also arisen with regard to protection of cultural resources at projects that are underway. For example, the Colorado River Indian Tribes (CRIT) recently learned that significant cultural resources were discovered at the site of the Genesis Solar Energy Project. Letter from the Colorado River Indian Tribes, to George Kline, Bureau of Land Management (Dec. 9, 2011). The BLM took over two weeks to notify the CRIT of the discovery, contravening the National Historic Preservation Act and its regulations. *Id.* (citing 36 C.F.R. § 800.13(b)(3); Programmatic Agreement § VI(b) (incorporating requirements of 36 C.F.R. § 800.13(b)(3)). BLM agreed to allow construction to continue on the historical site before even alerting the CRIT, despite the fact that the Programmatic Agreement states that avoidance of the discovered site is the preferred method of mitigating damage to cultural resources. *Id.* (citing Programmatic Agreement, App. B, § III(a)(ii), App. J, §2.0). The Quechan Tribe offers the following comments because it is aware that its cultural resources are at risk of destruction from future solar projects without adequate safeguards in the Supplement.

II. Comments Of Quechan Tribe on Solar PEIS

A. The Supplement's Use of Legal Mandate Language Continues to Mislead the Public Because There Is No Congressional or Executive Mandate for Utility-Scale Solar Development.

The Supplement continues to state that there is a legal mandate for utility-scale energy development on public lands. The paragraph outlining the BLM's purpose for its proposed Solar Energy Program states that it "will further the BLM's ability to meet the *mandates* of Executive Order (E.O.) 13212 (--Actions to Expedite Energy-Related Projects, *Federal Register*, Volume 66, page 28357, May 22, 2001) and the Energy Policy Act of 2005...." Page 1-3 (emphasis added). As noted in our previous comment letter, the Energy Policy Act of 2005 does not contain a mandatory directive of any kind, and E.O. 13212 requires that departments comply with all relevant laws to ensure that energy projects are safe and environmentally sound. While the Supplement does acknowledge that Secretarial Order 3285A1 requires identifying and prioritizing locations best suited for large-scale solar development, stating that a federal or executive mandate exists to develop utility-scale sustainable energy projects on public lands falsely turns a mere allowance into a direct order. Any reference to a federal or executive mandate should be removed from the Supplement, so as not to mislead the public and skew the analysis of the various alternatives.

B. The Tribe Remains Opposed to the No-Action Alternative, Because Case-By-Case Project Approvals Fail to Protect Public Lands.

The Supplement does not alter the No-Action Alternative, meaning the status quo would continue if this alternative is chosen. The current BLM case-by-case analysis and review of individual solar energy applications has proved to be a bane to both solar energy developers and those interested in protection of public lands and resources. Due to the flaws in the existing system and its failure to sufficiently protect impacted resources, the BLM must identify and set apart certain lands that are best-suited for utility-scale solar development, and must prohibit such development on all other land areas.

C. The Supplement's Modified Solar Energy Development Program Alternative Fails to Address the Quechan Tribe's Concerns of Opening Too Much Land to Utility-Scale Solar Development, and Authorizing Development on Sensitive Lands; This Alternative Must Be Rejected.

The Modified Solar Energy Development Program Alternative (modified alternative) must be rejected. The modification still allows utility-scale development on over 20 million acres, which is a difference of approximately 1.2 million acres from the Solar PEIS. This minimal change is not enough to protect sensitive land, and opening such a large swath of land to utility-scale solar development is unnecessary because the BLM estimates that only 214,128 acres would likely be developed over the next 20-year period. Page 2-71. While the modified alternative does exclude certain land areas previously included in the SEZs, the exclusions are not enough to adequately protect the important resources at risk. The Tribe's concern that opening up such a vast amount of land will result in the same problems and inefficiencies that exist under the current system is not resolved by excluding a few more acres. If the BLM identifies land that is best suited for utility-scale solar development, there should not be a need to open up over 19 million additional acres in the name of flexibility. The variance process is superfluous because the BLM should have prospectively identified land with low resource value, minimal conflict with adjacent land, and that is suitable for solar energy development.

D. The Modified SEZ Program Alternative Represents The Best Alternative Evaluated In the Supplement.

The modified SEZ alternative allows utility-scale solar development on SEZs prospectively identified as lands well suited to such development. The Supplement reduced the total proposed acres available from nearly 700,000 to nearly 300,000, and this reduction applies to both the modified alternative and the modified SEZ alternative. Pages 2-15, 2-18, 2-41. Upon further study, the BLM determined that some lands identified as SEZs in the Solar PEIS were inappropriate based on substantial resource conflicts. Page 2-15. This reduction exemplifies why the modified SEZ alternative is the best approach to utility-scale development. Without studying land in depth to identify whether or not it is appropriate for this form of development, significant natural and cultural resources will likely be put at risk. Even with the reduction in SEZs, more than enough land is available to meet the expected 20-year build out of 214,128

acres. In addition, the BLM has already begun efforts to identify additional SEZs in four of the six states at issue. Pages 2-28, 2-71. Thus, any possible shortage of SEZs could be addressed by identifying new and appropriate SEZs in the future. The SEZ alternative is the better approach to utility-scale solar development on public lands because it "limits development to areas with known environments and investigated effects." Timothy P. Duane et al., *Water, Work, Wildlife, and Wilderness: The Collaborative Federal Public Lands Planning Framework For Utility-Scale Solar Energy Development In The Desert Southwest*, 41 ENVTL. LAW 1093, 1190 (2011). The modified SEZ alternative best balances the goals of protecting resources with creating sustainable solar energy development.

E. The Supplement Does Not Address The Tribe's Concerns Regarding Utility-Scale Solar Energy Development on Class L Lands Within the California Desert Conservation Area.

The Supplement does not address the Tribe's concerns regarding designating Class L lands as appropriate for utility-scale solar energy development. Interior and the Department of Energy should revise the Supplement to exclude utility-scale solar energy development on Class L lands within the California Desert Conservation Area because such development is not consistent with the Class L land designation, as explained in the Tribe's comment letter to the Solar PEIS, dated March 7, 2011.

F. The BLM Improperly Continues to Process Solar Energy Projects in the Absence of a Solar Energy Program.

Processing active applications for utility-scale solar development improperly interferes with the purposes of the Supplement because there is no mechanism in place to protect important resources at risk. The Supplement notes that applications on lands proposed as exclusion areas in the Final Solar PEIS are likely to be denied, which leaves open the possibility that pending applications could be approved in areas that would be excluded from large solar development projects under the Supplement. That possibility largely defeats the purpose of this planning process. In order to promote the protection of important resources and a more efficient process, Interior must wait until a Solar Energy Program is established before processing pending solar projects.

G. The Supplement Fails to Remove Imperial East as a Solar Energy Zone Despite the Prevalence of Cultural Resources, Prehistoric Human Remains, and Visual Impacts

The Tribe generally supports the SEZ concept, yet, lands known as Imperial East must not be designated as a SEZ. The Imperial East lands are Class L lands, which, as described above, are not appropriate for utility-scale solar energy development. Moreover, these lands are located within the traditional territory of the Quechan Tribe, and are situated in close proximity to lands known and recognized for their cultural sensitivity. Unfortunately, very little land within the Imperial East SEZ has been surveyed for cultural resources, so possible impacts

remain unknown. Page C-51. Considering the likelihood that Quechan cultural sites and even Quechan ancestors' remains lie within this area, it is inappropriate to designate it as a SEZ.

H. No Government-to-Government Consultation Has Occurred Between Interior and the Quechan, As Section 106 Demands.

The Supplement states that government-to-government consultation is underway, yet there has been no effort for such consultation with the Quechan Tribe. Pages 2-22, 2-23, 2-82. The Tribe expects full compliance with Section 106 of the National Historic Preservation Act process, and expects the federal agencies to fulfill their obligations to meaningfully consult with the Tribe on a government-to-government basis when reviewing proposed projects that could affect resources of significance to the Tribe. *See* Page 2-23 (stating that the BLM will invite tribal participation in site-specific proposals located within SEZs). The Tribe further expects Section 106 compliant consultation on concerns related to traditional cultural properties, ethnobotanical resources, visual resources, and the effects of solar development on tribal interests. *See* page 2-23. The Quechan Tribe objects to any process that would result in approval of utility-scale solar projects prior to full completion of the Section 106 and government-to-government consultation processes. The Tribe also objects to any plan that defers consultation until some future time after a project has been approved. *See* Order Granting Preliminary Injunction, *Quechan Tribe of the Fort Yuma Indian Reservation v. United States Department of the Interior*, 755 F. Supp. 2d 1104 (S.D. Cal., December 15, 2010) (enjoining construction of Imperial Valley Solar project due to failure of United States to properly consult with Quechan Tribe).

I. Additional Comments.

As stated in Table 2.3-4, the Tribe agrees that the use of previously disturbed lands within SEZs should be encouraged, however, cultural resource surveys and completion of the Section 106 process are necessary to protect important resources that could be present.

The Tribe supports the exclusion of "[a]reas with important cultural and archaeological resources, such as traditional cultural properties and Native American sacred sites . . . ." Table 2.2-1. In determining land that best suits utility-scale solar development, it should always be possible to avoid areas containing sensitive cultural and historic resources and sacred sites.

Table 2.3-2 continues to state that the impacts to cultural resources would be the same for both the modified SEZ program alternative and the modified program alternative, except the impacts in the modified SEZ Program would be concentrated in a smaller area. As described in the Tribe's comments to the Solar PEIS, the impacts under the modified program alternative would be far greater based on the huge amount of land available for utility-scale development.

The Supplement states that cumulative effects of utility-scale solar development are expected to be less under the modified alternative and the modified SEZ alternative, but it does not address the Tribe's concern that the Solar PEIS inaccurately analyzed the cumulative effects on cultural resources. Page 2-80; *See* page 6-100 in the Solar PEIS. The Final Solar PEIS must

require an analysis of whether specific land targeted for development has significant cultural resources, and if so, that area must be avoided.

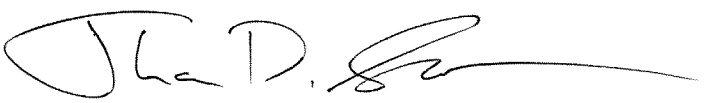
The Supplement fails to address the need for a cultural resource consultation in the pre-application process. The Solar PEIS, Appendix A, Section A.2.1.2.2, describes the proposed pre-application process for the future Solar Energy Program, which requires the applicant to consult with holders of grazing rights and mining claims in the pre-application process. A cultural resource consultation must also be a part of this pre-application process in order to identify cultural resources at an early stage.

Lastly, Interior must ensure that any proposed utility-scale development within the CDCA is limited to Class M or I lands, as Class L lands are inappropriate for such intensive development. Interior should also consider public lands outside the CDCA in California for solar energy projects.

Thank you for your consideration to the Tribe's comments.

Sincerely,

MORISSET, SCHLOSSER, JOZWIAK & SOMERVILLE



Frank R. Jozwiak
Thane D. Somerville
Attorneys for Quechan Indian Tribe

cc: President Keeny Escalanti, Sr. (via e-mail)
Vice-President Ronda Aguerro (via e-mail)
Members of the Quechan Tribal Council (via e-mail)
Pauline Jose, Chairperson, Quechan Cultural Committee (via e-mail)
Members of the Quechan Cultural Committee (via e-mail)
John Bathke, Historic Preservation Officer (via e-mail)

Thank you for your comment, Elizabeth Michalak.

The comment tracking number that has been assigned to your comment is SEDDsupp20058.

Comment Date: January 25, 2012 17:56:26PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20058

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Attachment:

Comment Submitted:

Hello,

After attending the meeting in Alamosa, CO regarding the supplement to the draft solar PEIS, I was very appreciative of how seriously the BLM is treating public comment. Thanks to all of you involved.
I do have some overall concerns regarding the project, and have listed them below.

I feel that solar generation, at its best, can be integrated into local communities, benefiting the local economy and making a minimal impact on the nvironmental/cultural surroundings.

Regarding projects on BLM land, I have concern that, A: the communities/counties where the solar projects will be built will not benefit financially (because of the areas being located on public lands) but will still have to deal with road maintenance, housing issues due to "imported" employees, etc. and
B: that the minimum scope of the proposed projects being set at 20 megawatts will mean big impact on the surroundings, both on environment/wildlife and culture/quality of life for local residents.

In my view, generating green energy on a commercial level and transmitting it from rural to urban areas runs the risk of negatively impacting local communities and environment, hence reducing the integrity of "clean" power. If it is absolutely necessary to open public lands for solar, I see several things that could help maintain this integrity. One: a financial incentive to the local counties, Two: acceptance of bids for smaller projects, and Three: focus on channeling the power as locally as possible. Urban landscapes have such a high potential for distributed solar (rooftops, etc) that it seems unnecessary to allow them to use power generated far away on what had been undisturbed public land.

Thank you for your work and conscientious review of this process.

Sincerely,
Elizabeth Michalak

Thank you for your comment, Christopher Lish.

The comment tracking number that has been assigned to your comment is SEDDsupp20059.

Comment Date: January 25, 2012 18:16:16PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20059

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Attachment: 120125_solar_energy_draft_peis_supplement.doc

Comment Submitted:

Wednesday, January 25, 2012

Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue
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Argonne, IL 60439

Subject: Improve and Finalize Solar Zoning Program to Protect Wildlife Habitat and Parks in the Southwest from Poorly Sited Solar Energy Development while Promoting Distributed Solar Energy

Dear Secretary Salazar,

Thank you for the opportunity to comment on the Supplement to the Draft Programmatic Environmental Impact Statement (PEIS) for Solar Energy Development in Six Southwestern States. I am submitting these comments as someone who cares deeply about preserving our precious Western ecosystems and wildlands. To better protect and preserve our environment for current and future generations, it is critical that we halt climate destabilization and end our dependence on fossil fuels as quickly as possible. Our nation must transition from a dirty fossil fuel-based economy to one that runs on clean energy. To that end, I strongly support developing distributed renewable energy sources, including solar, but not at the expense of our national parks, wilderness, and conservation heritage. We must ensure that the development of any large-scale renewable power plants on our public lands is done right—by protecting our wildlife, wildlands, and water resources.

> "Our duty to the whole, including to the unborn generations, bids us to restrain an unprincipled present-day minority from wasting the heritage of these unborn generations. The movement for the conservation of wildlife and the larger movement for the conservation of all our natural resources are essentially democratic in spirit, purpose and method."
> -- Theodore Roosevelt

As part of a clean energy future that includes robust commitments to energy efficiency and conservation—and widespread use of rooftop solar energy production—I support environmentally responsible solar projects on our public lands. The best path going forward will guide solar development to lands with the highest quality solar resource, where the power generated can be delivered easily and over a short distance to consumers, and where there is the lowest potential for conflict with fish, wildlife, public access, and other values and uses. If done smart from the start, renewable energy development on public lands can both help meet our climate and clean energy needs and protect our beloved parks, wildlands, and crucial wildlife habitat.

> "As we peer into society's future, we—you and I, and our government—must avoid the impulse to live only for today, plundering for our own ease and

> convenience the precious resources of tomorrow. We cannot mortgage the material assets of our grandchildren without risking the loss also of their political and spiritual heritage. We want democracy to survive for all generations to come, not to become the insolvent phantom of tomorrow."
> -- Dwight D. Eisenhower

We have an historic opportunity to get solar development right on public lands, and the long-term plan for solar now under development—the Supplement to the Draft Solar PEIS—will play a critical role. I applaud the Bureau of Land Management (BLM) in responding to recommendations from the public to focus development in pre-screened, low-conflict zones. Guiding solar development to appropriate places is the best way to ensure that the benefits of solar energy are realized while also safeguarding our public wildlands.

> "We abuse the land because we regard it as a commodity that belongs to us. When we see the land as a community to which we belong, we may begin to use it with love and respect."
> -- Aldo Leopold

Currently, the solar resources of our public lands are being managed on the same antiquated project-by-project basis that oil and gas resources have been managed. Continuing this scatter-shot approach and permitting these very large projects to be dotted across our public lands is certain to harm sensitive wildlife species and diverse recreational opportunities, and will also lead to costly conflicts, delays, and litigation at a time when solar energy is needed to improve our energy security and provide much-needed jobs.

> "The nation behaves well if it treats the natural resources as assets which it must turn over to the next generation increased, and not impaired, in value."
> -- Theodore Roosevelt

Overall, the Supplement is a step in the right direction, and most of the elements should be carried through in the final plan. The Supplement clearly draws on the input received from conservationists and others. Significant improvements to the draft include the commitment to do more research on wildlife impacts, the pledge to make more sensitive areas off limits to development, and the inclusion of additional incentives to drive development to low-conflict solar energy zones. With some additional work to limit development outside the designated zones and provide adequate mitigation for habitat losses, the proposed solar zoning framework will serve as an effective, strategic roadmap to developing the most appropriate solar resources on public lands.

> "For in my experience it seems well-nigh impossible to obtain a hearing on behalf of Nature from any other standpoint than that of human use."
> -- John Muir

I strongly support developing rules to guide solar energy projects on the most appropriate locations on public lands to minimize impacts to wildlife and ecosystems. I commend the BLM for recognizing the need for a better way to develop solar projects, by designating zones that minimize conflicts with wildlife and other resources and providing incentives for projects located in these zones. I also appreciate your recognition of the need to provide limited flexibility to the solar industry for well-sited projects outside zones. These rules should be applied to all solar energy applications on public lands, not just those filed after October 28, 2011. I am concerned, however, that your proposal to allow additional projects outside zones (the "Variance Process") could undermine this entire solar energy program if it is not limited to places with low environmental value. These proposals should meet strict environmental criteria. Adoption of these and other proposed program components will help protect the unique and sensitive resources of our public lands while providing more certainty to all stakeholders.

> "If future generations are to remember us with gratitude rather than contempt, we must leave them with more than the miracles of technology. We must leave them with a glimpse of the world as it was in the beginning, not just after we got through with it."
> -- Lyndon B. Johnson, upon signing the Wilderness Act, 1964

I am also seriously concerned that the revised plan still leaves some wilderness quality lands open for development. To ensure that solar development on public lands is smart from the start, I recommend that:

- The BLM should exclude all Citizens' Wilderness Proposal lands (wilderness quality lands) from development;
- The BLM should ensure that these large solar projects are built primarily in the zones; and
- The BLM should provide a 60 day comment period on the final plan to allow public response to additional information in the final plan.

> "In permitting the sacrifice of anything that would be of the slightest value to future visitors to the convenience, bad taste, playfulness, carelessness, or wanton destructiveness of present visitors, we probably yield in each case the interest of uncounted millions to the selfishness of a few individuals."
> -- Frederick Law Olmstead

To help ensure national parks are protected, I ask that you exclude new solar development on lands within 15 miles of national park units unless the National Park Service determines these lands are suitable for consideration under the "variance" process and can be developed without damaging park resources. This precautionary "smart from the start" approach is justified because these lands are critical to the ecological health of park resources and the experience of park visitors. Without strong safeguards in place, vast solar energy facilities could potentially be built under the variance process and present the following threats:

- Fragmentation of wildlife corridors crucial to wide-ranging species. Examples include lands on Joshua Tree National Park's north and northeast boundaries that are utilized by Desert Tortoises and connect the park to nearby wilderness areas. Also, allowing solar development in old-growth Joshua Tree woodlands, such as what could happen north of Mojave National Preserve's Clark Mountains and east of the Preserve's New York Mountains should be avoided.

- Harming scenic vistas. By placing solar projects on our national parks' doorsteps, we will negatively affect the experience so many Americans cherish. For instance, industrializing Death Valley's eastern boundary could negatively affect the parks stunning wide open vistas, as well as reduce habitat and water resources for rare and endangered species.

> "One hundred years from now, as people look back on our use of this continent, we shall not be praised for our reckless use of its oil, nor the loss of our forests; we shall be heartily damned for all these things. But we may take comfort in the knowledge that we shall certainly be thanked for the National Parks."
> -- Secretary of the Interior Ray Lyman Wilbur, 1931

I commend the BLM for proposing to exclude fragile and ecologically important areas from solar development in response to environmental concerns ("Exclusion Areas"). Please expand the Exclusion Areas to include environmentally sensitive areas important to the survival of wildlife species such as: wildlife habitat management areas, desert tortoise connectivity areas, and the entire Ivanpah Valley in both Nevada and California.

> "Every man who appreciates the majesty and beauty of the wilderness and of wild life, should strike hands with the farsighted men who wish to preserve our material resources, in the effort to keep our forests and our game beasts, game-birds, and game-fish—indeed, all the living creatures of prairie and woodland and seashore—from wanton destruction. Above all, we should realize that the effort toward this end is essentially a democratic movement."
> -- Theodore Roosevelt

I urge you to take this common-sense approach that will allow solar development that is faster, cheaper, and better for the environment and consumers. By focusing on the places that have the best chances for success and having a clear plan to deal with potential impacts before they occur, the BLM can ensure that solar development avoids the many conflicts, controversies, and impacts that have blocked oil and gas development on public lands and we will be able to move quickly to develop our solar resources. This will enable America to better meet our clean energy demands while also preserving our nation's wildlife, wildlands, and other natural treasures.

> "It is our task in our time and in our generation, to hand down undiminished to those who come after us, as was handed down to us by those who went before,

> the natural wealth and beauty which is ours."
> -- John F. Kennedy

Thank you for working to balance our need for solar energy with protecting wildlife and habitats in America's national parks and other sensitive lands. Please improve and finalize this much-needed program and continue to work to establish wildlife-friendly and consistent rules for developing solar energy on our public lands.

> "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."
> -- Aldo Leopold

Thank you for your consideration of my comments. Please do NOT add my name to your mailing list. I will learn about future developments on this issue from other sources.

Sincerely,
Christopher Lish
Olema, CA

Thank you for your comment, Larry Johnston.

The comment tracking number that has been assigned to your comment is SEDDsupp20060.

Comment Date: January 25, 2012 18:19:03PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20060

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Attachment: solar_letter--final[1].docx

Comment Submitted:

From the Office of:

Larry K. Johnston

Supervisor, District 1
Mono County, California

Bureau of Land Management
Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue—EVS/240
Argonne, IL 60439

Dear Ms. Stewart,

Please consider these as my comments on the Supplement to the Draft Solar Energy Programmatic Environmental Impact Statement.

Mono County, like many counties in the West, contains a great amount of BLM lands. I support the BLM focusing solar development in pre-screened, low-conflict zones; the Supplement is a step in the right direction. However, I would suggest the plan provide additional incentives for building projects in low conflict zones and avoid development on public lands that are important for wildlife, recreation, and tourism, to wit:

- Large-scale solar projects should be built primarily in the pre-screened, low-conflict zones;
- Counties should have a major role in designating future solar energy zones; and
- BLM should have a 60 day comment period on the final plan to allow public response to additional information in the final plan.

By focusing on low-conflict zones, the BLM would be taking an approach that will allow solar development that is faster, cheaper and better for the environment, consumers and our western counties.

In Mono County specifically, I suggest that the Volcanic Tablelands (which are north of Bishop, CA) not be open to variance applications. These Tablelands contain rocky, undulated topography not suited to large scale solar (significant grading required). Additionally, this region is laced with sensitive cultural resources (village site, petroglyphs, etc.), has high visual impacts, and is popular for diverse types of recreation.

Thank you for your consideration.

Sincerely,

Larry K. Johnston
Supervisor, District 1

P.O. Box 347, Mammoth Lakes, California 93546 (760) 924-1806

Thank you for your comment, Mark Wintch.

The comment tracking number that has been assigned to your comment is SEDDsupp20061.

Comment Date: January 25, 2012 21:35:50PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20061

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Attachment: BLM SEZ complaint letter.docx

Comment Submitted:

To whom it may concern:

While reviewing the Programmatic Environmental Impact Statement for Solar Energy Development in Six Western States I have found several errors in the Wah Wah Solar Energy Zone summary that I would like you to be aware of.

- On page C-302, bullets two and three are of concern. While it may be only three percent of the total allotment of the permittee, it will impact watering and traveling of the cattle eliminating more than the acres directly in the SEZ. Also, barring the ground will cause soil erosion by wind. The past several years we have had a severe drought and much of the soil has been blown away without barring the ground with equipment.
- Page C-304, the last bullet indicates noise levels that would not meet the EPA guidelines and Iron county regulations. The Wah Wah SEZ is not in Iron County, it is in Beaver County. The noise level at the nearest residence, and dust level for that matter, would be much greater because the Wah Wah Ranch is directly next to the SEZ.
- Page C-317, the first paragraph mentions a power line that ran to the Desert Experimental Range. It was a phone line and has no significant value.
- Page C-318, the second to last paragraph states that the Sevier River "begins in a meadow high in the Wasatch Mountains". This is factually not so. The Sevier River begins in the mountains east of Cedar City and south of Panguitch Utah.

These are a few examples of many items that are incorrect within the document. If there is this many flaws in this short of a section how many more problems are there within sections that I have not read? My concerns are related with the area around the SEZ area. I live directly north of the proposed site. This will have a negative impact on my farming operation and my feed lot. Barring the ground will damage my crops and affect the health of my cattle in a negative way. I may be one operation and only one family in the entire valley but we have lived here and operated this ranch for over 100 years. Creating a SEZ will have a negative impact on me and my family's way of life. It is maddening that so much care is given to the past and the ancient peoples who lived here and the present occupants seem to have little or no say in a matter that may drive them from their home and their business.

I also do not understand why the BLM would want to bare ground when 10 miles to the north of the proposed SEZ there is a hard pan area where no vegetation grows. If the ground is barren the erosion factor would disappear. I oppose the creation of this SEZ and would encourage you to do a better job putting factual and relevant information in a document that costs this much and of this importance.

Thank you

Mark Wintch,

Owner Operator of the Wah Wah Ranch

Thank you for your comment, Kevin Emmerich.

The comment tracking number that has been assigned to your comment is SEDDsupp20062.

Comment Date: January 26, 2012 00:56:13AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20062

First Name: Kevin
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Attachment: BRW-PEIS 2012.pdf

Comment Submitted:

Please see attached file

January 25th, 2012

Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue
EVS/240
Argonne, IL 60439

Sent via comment form on PEIS web site:

Please accept the following comments on the Supplement to the Solar Programmatic Environmental Impact Statement

Basin and Range Watch is a group of volunteers who live in the deserts of Nevada and California, working to stop the destruction of our desert homeland. Industrial renewable energy companies are seeking to develop millions of acres of unspoiled habitat in our region. Our goal is to identify the problems of energy sprawl and find solutions that will preserve our natural ecosystems and open spaces. We have visited the site containing the entire Right of Way proposal for Silver State North and Silver State South. We have found several important resources on these sites including a healthy desert tortoise population.

Purpose and Need:

All alternatives are now defined by a Need reflecting the recent Secretarial Order 3283: Enhancing Renewable Energy Development on Public Lands.

The goals of Section 4 in Secretarial Order 3283 clearly state a need for environmental responsibility: *"the permitting of **environmentally responsible** wind, solar, biomass, and geothermal operations and electrical transmission facilities on the public lands;*

The projects that would be associated with the solar PEIS would be utility scale and would demand anywhere from 2,000 to 10,000 acres. There is no way developments on that scale can be considered "environmentally responsible".

The Purpose and Need Statement for both the BLM and DOE should include a need to site solar energy using distributed generation systems and on Environmental Protection Agency identified brownfields. By placing renewable energy in the built environment and on degraded

lands, we can avoid conflicts involving biological resources, cultural resources, groundwater issues, altercation of floodwaters, air quality issues, impacts to wilderness areas and national parks, property values, visual resources and public health.

Alternatives:

A full range of alternatives should be considered in every EIS document. That is required by NEPA.

Following the guidelines of the National Environmental Policy Act, the final EIS should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision maker and the public. In this section agencies shall:

(a) Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.

(b) Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits.

(c) **Include reasonable alternatives not within the jurisdiction of the lead agency.**

(d) Include the alternative of no action.

(e) Identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference.

(f) Include appropriate mitigation measures not already included in the proposed action or alternatives.

Alternatives not within the jurisdiction of the lead agency:

These should include a **Distributed Generation** Alternative and an **EPA Identified Graded Lands Alternative**. As pointed out above, these alternatives are required to be considered under NEPA. Recent “mandates” by the Interior Department discourage these alternatives, but these are worded carefully using terminology like “recommends”. The fact is that there are no mandates that say that BLM can not consider an off- site alternatives to projects that will have major impacts to resources on public lands.

In its original scoping letter on the recent Solar Programmatic Environmental Impact Statement, The Environmental Protection Agency has identified hundreds of thousands of acres of degraded and contaminated sites around the country which could generate up to 920,000 MW of solar generation. This could easily replace and surpass any desire to develop 285,000 acres of untrammeled public lands.

Now that unlimited Federal subsidies for renewable energy projects are a thing of the past, the realities of feasible solar energy production are all on the table. Extreme cost and resource conflicts are eliminating the Concentrated Solar Thermal designs from the picture. BrightSource is one of the few survivors because their capitol was originally provided by federal subsidies. The rest appear to be falling like dominos. Almost all utility scale solar designs are now photovoltaic. While it is difficult to use CSP technology on the distributed scale, photovoltaics can be used at any scale in many configurations. In December, 2011, Germany installed 3,000 MW of rooftop, distributed energy. That is more MW in one month than all of the utility scale projects being built in the US would produce combined so far. http://www.solarserver.com/solar-magazine/solar-news/current/2012/kw02/german-pv-installations-in-2011-even-higher-than-in-record-year-2010-3-gw-installed-in-december.html

Even under the best case scenario, utility scale PV will lose ten percent capacity in the transmission journey alone.

Distributed generation in the built environment should be given much more full analysis, as it is a completely viable alternative. Environmental costs are negligible with distributed generation, compared with this proposal. Distributed generation cannot be “done overnight,” but neither can large transmission lines across hundreds of miles from remote central station plants to load centers. Most importantly, distributed generation will not reduce the natural carbon-storing ability of healthy desert ecosystems, will not disturb biological soil crusts, and will not degrade and fragment habitats of protected, sensitive, and rare species.

Alternatives should be looked at that are in load centers, not closest to the project site. There is a need to consider the “macro” picture, the entire state, to look at maximum efficiency.

A master comprehensive plan should exist before large expensive inefficient solar plants are sited and built out in the wildlands. This plan should carefully analyze the recreational and biodiversity resources of the southwest. A list of assumptions should be included detailing the plan for integrating various fuels mixes and technologies into each utility's plan, an overall state plan, and a national plan. Loads should be carefully analyzed to determine whether additional capacity is needed for peaking, intermediate, or baseload purposes. Unit size, which impacts capital and operating costs and unit capacity factors, has a direct bearing on the relative economics of one technology over another. A plan might recommend that smaller units built in cities and spaced in time offer a less risky solution than one large unit built immediately.

Right now there is no utility plan, no state plan, and no national plan. Large-scale central station energy projects have been sited very far from load centers out in remote deserts, with the only criterion being nearness to existing transmission lines and natural gas lines. Very little thought has been given to the richness of biological resources, the cumulative impacts on visual scenery to tourists, the proximity to ratepayers, or the level of disturbance of the site.

The California Energy Commission says they will be a need to build many new efficient natural gas peaker or baseload plants to back up the renewable projects planned. Instead, the renewables should be distributed generation in load centers, which will provide much more efficiency, rather than inefficient remote central station plants that reduce biodiversity and require expensive transmission lines. This reduces the risk, as distributed generation is a known technology and has been proven in countries like Germany where incentive programs have been tested. Incentive programs can be designed in an intelligent manner to vastly increase distributed generation. Incentives for large remote projects are unproven to lower risk and may actually raise debt levels with runaway costs associated with poor sighting and higher-than-anticipated operating and maintenance costs.

Our Preferred Alternative:

Our preferred alternative for the PEIS would be to adopt a No Action Alternative and develop a policy that promotes renewable energy on a distributed scale. We would support policy that favors no solar development on public lands and examines solar development on brownfields and on a distributed scale.

Variance:

It has seemed unclear throughout this entire process what exactly BLM and DOE are attempting to do here. On the one hand, you want to create what seem to be one-stop approval zones for solar developers on a vast amount of public land – 285,000 acres, but you are still opening up 22 million acres to the business as usually solar energy review.

By creating 285,000 acres of one-stop approval Solar Energy Zones and keeping the "Priority Projects" along with variance in your preferred alternative, you are just giving more away to the solar industry at the expense of tax payers and public land owners.

Specific Comments on Solar Energy Study Zones:

We have made comments on the original PEIS, but we would like to provide the following additions to these comments on these 4 Solar Energy Zones.

Amargosa Valley, Nevada:

We believe the BLM took a step in the right direction by reducing this SEZ to 8,000 acres, but we still would like to point out the following issues:

Eight thousand acres still would be 12 square miles of development. Amargosa Valley, Nevada has historically had numerous conflicts regarding dust. There have been heated debates over the local dairy farm as well as BLM permitted off highway vehicle races running through the valley.

Public health issues with dust can include concerns about Valley Fever as well as elevated levels of radon being stirred up by dust.

Due to past underground atomic tests on the adjacent Nevada Test Site, soil radon levels are three times the national average in parts of Amargosa Valley. Will plowing up so much soil create health problems for local people as radon particulates are stirred up by construction and local wind gusts?

At this time, there have been a few large scale utility scale solar projects approved. The Desert Sunlight Project in Riverside County has been creating dust issues in spite of strict mitigation measures.

Controlling dust is difficult in arid environments and the following photos show how efforts to mitigate dust for recently approved energy projects under construction have mostly failed:

^Above is the lay down area for construction of the Sunrise Powerlink, Imperial Valley, California. Dust is commonly stirred up during windy weather. Mitigation efforts have not controlled this.

^The above two photos show the now bankrupt Solar Trust of America Blythe Solar Energy Project near Blythe, California. The Right of Way was approved. The company started construction and had to return their 2.1 billion dollar DOE loan when they went under. Efforts to control dust went on in spite of the fact that there is no future for this project. Water trucks were wetting the new roads everyday until September. To save water, the company laid down an acrylic on their new roads. It is not working. Residents are complaining that the wind commonly stirs up dust from the disturbance.

^The First Solar, Desert Sunlight Project located near Desert Center, California. The applicant is in violation of dust mitigation standards.

Vast amounts of water are needed to control dust. In the case of the Desert Sunlight Project, local water well levels are starting to fall due to all of the water needed to mitigate construction dust. The applicant has agreed to dig local wells deeper if this happened. The Desert Sunlight Project has only developed 200 acres of the 4,400 acres they plan to develop. How can there

possibly be enough water for this? Most desert aquifers are fossil aquifers. Water is left over from wetter climatic phases. They simply do not recharge water.

The Amargosa SEZ would be 8,000 acres or 12 square miles. The Amargosa Valley lies in Basin 230 in the Nevada State Engineer's water jurisdiction. The Amargosa Valley is over-drafted by 17,000 acre feet. Even if solar energy plants are photovoltaic, this would still require thousands of acre feet for construction and dust control as well as 5 or 6 acre feet a year for panel washing. Solar applicants are often dishonest about how much water they would use for panel or mirror washing. First Solar has often falsely stated at public meeting presentations that they will not use any water to wash their solar panels. This is simply not true. They often build their projects next to dry lakes or other areas where dust is common.

The Amargosa SEZ would be 12 square miles and would create a large visual disturbance. This disturbance would be highly visible from the wilderness areas of Death Valley National Park.

Landscape-level analyses of cultural resources should be undertaken for each SEZ, as well as more detailed archaeological, ethnographic, and historic surveys. A greater effort should be made to contact and follow through coordinating with as many Tribes and local groups as possible.

The Amargosa Valley has a healthy population of Burrowing owls (*Athene cunicularia*). Burrowing owls are declining in much of their range. This is well documented in California: http://articles.latimes.com/2010/sep/27/local/la-me-burrowing-owl-20100927

Removing 8 square miles of their habitat in Amargosa Valley would threaten this population.

The Amargosa Valley is not appropriate for a Solar Energy Zone.

Gold Point:

There is no transmission in this area, and it remains a very wild area in Nevada. Gold Point is a popular ghost town. Here is no way to maintain the historic character of this area and develop it for industry at the same time.

There is even less water in this basin than there is in Amargosa Valley. It clearly has no infrastructure or water resources to be developed in an industrial fashion. It seems unusual that the BLM would have even considered this SEZ in the first place.

Millers:

The Solar Reserve, Crescent Dunes Project is being built near the Millers SEZ. The issue of avian mortality was never resolved for this project.

Any more solar power towers of any height should be excluded from Millers SEZ. A potentially serious problem with this type of solar technology, not present in parabolic trough plants, is the superheated beams reflected through the air over the heliostat fields onto the central receiver towers. Migrating or foraging birds have been burned to death flying through these beams. Energy flux amounts as high as 600 kW/square meter at the central receiver. A bird flying through the air will heat up crossing the concentrated solar beams, and could be burned.

The paper AVIAN MORTALITY AT A SOLAR ENERGY POWER PLANT, by Michael D. McCrary, Robert L. McKernan, Raplh W. Schreiber, William D. Wagner, and Terry C. Sciarrotta, Journal of Field Ornithology, 57(2): 135-141, found that Solar 1 in Dagget, California, during 40 weeks of study caused 70 bird fatalities involving 26 species, most from collisions with both heliostats and tower, but thirteen (19%) birds (of 7 species) died from burning in the standby point. Heavily singed flight and contour feathers indicated that the birds burned to death. Six (46%) of these fatalities involved aerial foragers (swifts and swallows) which are apparently more susceptible to this form of mortality because of their feeding behavior. Large 750-foot power towers proposed currently will have more than a thousand standby points encircling the tower receiver, and temperatures should be measured to determine if these will be as dangerous as the two standby points at the former Daggett power tower.

A discussion of how negative affects of collisions and burning by towers during operation will be minimized and mitigated for raptors, migratory species, other birds, and bats flying during the day needs to be included in the FEIS.

Raptors potentially resident or migratory on the site that could be adversely impacted by towers:

Merlin
American kestrel
Prairie falcon
Peregrine falcon
Northern harrier
Swainson's hawk
Ferruginous hawk
Rough-legged hawk
Osprey
Bald eagle
Golden eagle
Sharp-shinned hawk
Cooper's hawk
Northern goshawk

In addition, waterbirds and shorebirds may use the ephemeral wetlands at the Millers SEZ area.

The Miller's Rest Stop is a nationally known birdwatching hotspot due to its character as an artificial oasis in a large arid region. Rare birds every year are seen at this spot, and ecotourists travel great distances to observe these rare migrants. Every year new species are added, often

Neotropical migratory birds far off course from their usual range. Tourism in the Tonopah and Dyer areas is boosted by this and may contribute to local economies.

^The above photos show the Crescent Dunes Project under construction. The bottom photo shows how close it is to the Millers Rest Stop.

Polarized Glare:

The polarized, reflection appearance of large photovoltaic facilities assumes the appearance of a large body of water. This can potentially be a death trap. Birds and insects will use up energy to get to perceived water and end up dying of dehydration.

The Nature Conservancy released their Mojave Desert Ecoregional Assessment. In the assessment, they discuss the impacts of polarized light pollution on birds and insects:

"Light and noise pollution associated with electrical power plants can be problematic for wildlife. Polarized light pollution from PV panels can attract aquatic insects and other species that mistake the panels for bodies of water, potentially leading to population decline or even local extinction of some organisms (Horvath et al. 2010). Nighttime lighting for security or other reasons may negatively impact a variety of Mojave Desert species, many of which have developed nocturnal behavior to escape the daytime heat of the desert. *(Mojave Desert*

Ecoregional Assessment September 2010, The Nature Conservancy of California 201 Mission Street, 4th Floor San Francisco, CA 94105) p. 50"

^Polarized "lake effect" from the Copper Mountain Photovoltaic Facility, Nevada

East Riverside:

The East Riverside Solar Energy Zone is the biggest of the SEZ's and even though the BLM reduced the size down from approximately 200,000 acres to 149,000 acres, there are still many unresolved conflicts. Development at this scale threatens biological, cultural, hydrologic and visual resources.

The BLM has modified this SEZ and concentrates most of the main development around the Blythe area. It is frivolous for the BLM to consider letting that much land be released for development.

The following resources would be irreversibly damaged if this much land were allowed to be developed.

Microphyll Woodlands: The BLM and DOE received comments about the significance of McCoy Wash and how it contains ironwood trees that are close to 2,000 years old. As a result of this, McCoy Wash was excluded from this zone, but it appears that the BLM does not understand the concept of cumulative impacts, because the exclusion is only 1 quarter mile wide. All one needs to do is visit this area either by walking or driving on the backcountry roads and you will find that there are numerous microphyll washes that parallel McCoy Wash.

^This is one of countless clusters of micophyll habitat that has been approved for removal and replacement of solar panels in the Solar PEIS

It is a mistake to remove so much of this habitat for photovoltaic panels. Alternatives to destruction of these irreplaceable resources should be examined.

The biological diversity of micophyll habitat should be recognized.

The presence of Desert ironwood in the Colorado Desert increases avian habitat by 62 percent. Over 150 bird species use ironwood. Ironwood also can protect frost sensitive native plants growing beneath them. More than 230 plant species have been documented starting their growth under the protective microclimate of ironwood nurse plants. The ironwood microclimate fixates nitrogen in the soil. Annual wildflowers are abundant under ironwood on wet years.

There are 62 reptiles and amphibians, and 64 mammals that use ironwoods for forage and cover. Close to 250 insects have been recorded using ironwood trees.

We would like the BLM to analyze and attempt to quantify the loss of biological diversity from their proposal. By protecting a narrow sliver of microphyll in the area, what percentage of species and habitat function will be lost and how much will remain with the one percent that is left alone by the BLM?

Birds:

The Solar PEIS designates a very large area by the Colorado River as appropriate for solar energy development. This part of the SEZ is in close proximity to 4 US Fish and Wildlife Service National Wildlife Refuges: Cibola, Bill Williams, Imperial and Havasu. It is also near two globally

Important Bird Areas: Cibola National Wildlife Refuge and Important Bird Area north of the town of Blythe.

Some areas along the Colorado River are used for agriculture. A USFWS refuge manager pointed out that although some of the northern part of Cibola NWR adjacent to the project is currently grown in alfalfa and corn to feed thousands of wintering waterfowl, there is much riparian restoration happening now and planned for the future. This would include encouraging native willows, cottonwoods, and mesquite. Hundreds of acres of riparian tree restoration are planned here.

This part of the SEZ would be located in the Pacific Flyway, which is a migration corridor for diverse waterfowl reaching from the Sea of Cortez in Mexico, to the Salton Sea in Imperial Valley, California, northwards to the Central Valley marshlands, and eventually to Oregon wetlands where ducks and geese nest in summer. An offshoot of the flyway follows the Colorado River.

^Fish and Wildlife Service map of Pacific Flyway

All large solar energy plants will require large tracts of land. The problems with power tower technology are being reviewed by BLM, Fish and Wildlife and the California Energy Commission for the BrightSource Rio Mesa Project. The fact that BrightSouce would like to build this project so close to the Colorado River will probably cause the agencies to reject their application.

Parabolic trough and photovoltaic technology could have negative impacts for foraging birds and the polarized effect could disorient avian fauna.

Permitting so much development next to the Colorado River is not appropriate.

Agricultural Lands:

Local people from Blythe have told us that they are worried about all of the agricultural lands being bought up by fly-by-night solar developers. If photovoltaic plants are built, only about 5 to 10 full time jobs are created. This could very well be an economic dead end for the community of Blythe. Boom and bust subsidized energy projects have very little potential to create a sustainable economy.

Cultural Sites/ Archeology Sites:

The East Riverside SEZ contains thousands of cultural/archeology sites. The area around Blythe, California is very rich in cultural resources. The amount of land that would be written off for solar development is not acceptable. It would be impossible to both develop this land and preserve the cultural integrity of the region.

The Blythe area can also be described as a "Living Cultural Landscape" of the Colorado River Tribes who practice their tradition at these sites. We have asked them their opinion about proposed mitigation that would either avoid the sites, but surround them with development, relocating artifacts to museums and destroying artifacts but recording them first. In all cases the answer seems to be that the entire landscape is their "cultural site" and any modifications, with or without mitigation is not appropriate.

A broad area is needed to analyze cultural resources, not just project sites. Landscape scale analysis is needed, including thematic resources: what are the important archaeological information in the landscape? Is the ethnographic landscape still used? Springs, dune systems, mesquite groves should be analyzed for evidence of cultural use, including prehistoric agriculture. Paleoecological data should be analyzed. Are landscapes rare or present in every valley? These would include unique combinations of springs and mesquite groves.

More detailed ethnographic studies are needed, including oral histories from local bands and Tribes of how these landscapes were used. Archival sources are often too limited. How did the Tribes use the resources present? Specific landforms may be considered sacred to local Native people in the area, such as mountains, dunes, and springs. Viewsheds may be important to keep intact. Areas may be part of Storyscapes and Songscapes that continue to be used. Local Native people should be consulted about these potential concerns.

Ivanpah Valley: Nevada and California:

Ivanpah Valley lies in both California and Nevada. It supports a variety of important resources including desert tortoise habitat and connectivity, several rare plants, a rich cultural history and spectacular visual resources.

We would like to request that BLM remove the Ivanpah Valley from all variance and future consideration of any solar projects. Below are some of our main reasons:

1. Ivanpah Valley contains a stronghold population of desert tortoises *(Gopherus agassizii)*
2. As defined in the original Desert Tortoise (Mojave Population) Recovery Plan (1994), the region was within the Northeastern Mojave Recovery Unit for the desert tortoise, one of six designated evolutionary significant units. This population was understood to be genetically the most distinctive unit of the desert tortoise in the Mojave Desert. Northeastern Mojave desert tortoises were recognized as the most genetically distinct population of California's desert tortoises. The range of this population is limited in California and Ivanpah Valley contains a significant portion of this range. When the Recovery Plan was issued, some of the highest known tortoise densities were in southern Ivanpah Valley, with 200 to 250 adults per square mile.
3. In 2010 and 2011, the US Fish and Wildlife Service recommended that no more large scale solar development be approved in the Ivanpah Valley.

The BrightSource Ivanpah Solar Electric Generating System is now under construction. The impacts to the desert tortoise population are alarming.

The following numbers have been determined by private and public biologists working on the Ivanpah Project. The Revised Biological Assessment for the Ivanpah Solar Electric Generating System (ISEGS) Project of April 19, 2011 (prepared for Bureau of Land Management by Sundance Biology, Inc., Kiva Biological Consulting, and CH2MHill) states that 3,344 acres of desert tortoise habitat will be permanently removed, 176 acres more temporarily disturbed.

The revised June 2011 Biological Opinion from USFWS estimates that 51 to 141 adult and subadult tortoises may be found on the ISEGS site while 91 to 391 subadult and adult tortoises may be found on recipient sites where tortoises will be translocated to, a total of 142 to 532 tortoises.

The total number of immature tortoises (under 160 millimeters shell length) that could be impacted may be 891 to 3,236. Juvenile tortoises will suffer an estimated 90% mortality on the project site. And 451 to 1,631 eggs and hatchlings may be impacted by the project activities on site and in the surrounding areas.

Basin and Range Watch has submitted a nomination of the Ivanpah Valley to be considered for an Area of Critical Environmental Concern. The nomination can be viewed here: http://basinandrangewatch.org/Ivanpah-ACEC.html

The developer, First Solar, has two large applications for future solar development in Ivanpah Valley. The first is called the Stateline Project- a 2,200 acre proposed solar facility that would be sighted directly next to the BrightSource project. The second is the Silver State South Project which is a 13,000 acre Right of Way application. The actual size of the project is yet to be

decided. BLM has informed us that only 4,000 acres of this ROW will be approved, but we are still looking at six square miles of solar panels which would limit or cut off the connectivity of the desert tortoise.

We are hoping that BLM will accept our nomination as an alternative to any more large solar projects located in the Ivanpah Valley.

The PEIS has provided the map (below) which shows connectivity for desert tortoise in the Ivanpah Valley. This alternative excludes all tortoise connectivity zones for solar development. We believe that the BLM should exclude all connectivity corridors from any consideration of future solar development.

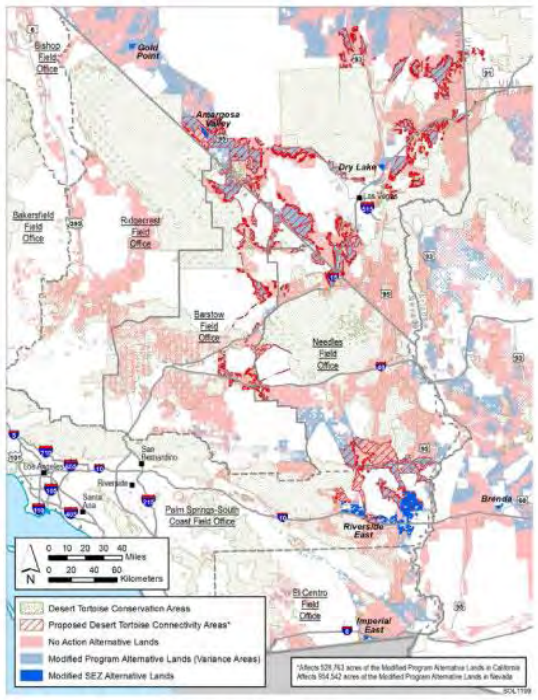

FIGURE 2.2-2 Desert Tortoise Conservation Areas and Proposed Connectivity Areas

Conclusion:

The PEIS is the wrong direction for land managers to go regarding solar energy. The Interior Department along with some environmental groups are supporting the whole “Smart from the Start” mentality. They want solar developed on what they think are the most disturbed wildlands. It turns out that every solar developer with an application on public lands has exaggerated the level of disturbance on the site they want to build on. We have found valuable

public land resources on every one of these fast tracked or prioritized projects. This is not how we should be managing public lands. Energy can go in the built environment and on degraded lands. Sacrificing public lands with multiple use mandates for one developer is inconsistent with the multiple use philosophy of the Bureau of Land Management. The PEIS is flawed because our alternatives of distributed generation and building solar energy on EPA identified brownfields have been ignored. Legally under the National Environmental Policy Act, you are required to consider these alternatives and you have not.

For a comprehensive description about the right and wrong way to use solar energy, please see Solar Done Right's report, Wrong from the Start. It can be viewed here: http://solardoneright.org/images/uploads/WrongFromTheStart.pdf

We do not believe the PEIS will work. Creating one-stop solar energy zones will not solve transmission issues. Federal subsidies will no longer be available to these developers. The PEIS came about too late to be effective. We believe that the BLM and the DOE should adopt a No Action Alternative and explore a policy that sites solar energy in distributed generation systems and on EPA identified brownfields.

Thank you,

Kevin Emmerich

Laura Cunningham

Basin and Range Watch

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Beatty, NV 89003

www.basinandrangewatch.org

Thank you for your comment, Jeremy Drew.

The comment tracking number that has been assigned to your comment is SEDDsupp20063.

Comment Date: January 26, 2012 09:22:05AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20063

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January 25, 2012

Ms Heidi M. Hartmann, Document Manager
Solar Energy Draft programmatic EIS
Argonne National laboratory
9700 Cass Avenue – EVS/240
Argonne, Illinois 60439

Re: Comments to Draft Supplemental Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

Dear Ms Hartmann:

The N-4 State Grazing Board is a political sub-division of the State of Nevada organized under Nevada Revised Statute 568 Grazing and Ranging. We are pleased to submit the following comments to the Draft Supplemental PEIS for Solar Energy Development (SPEIS). We have participated as a Cooperating Agency in the preparation of the PEIS and look forward to remaining a partner in this national renewable energy endeavor.

The N-4 State Grazing Board has cooperated with the Lincoln County Commission in the preparation of their comprehensive review of the Draft SPEIS. We are in strong support of their four-page cover letter and twenty-one pages of Specific Comments to the Draft SPEIS, sent to you on Wednesday, January 18, 2012 (copy attached for reference).

We are very gratified to see your recommendation that the East Mormon Mountain SEZ and the Delamar SEZ have been dropped from further consideration as a Solar Energy Zone. The reduction in size of the Dry Lake Valley North SEZ is encouraging. The N-4 State Grazing Board specifically supports the Dry Lake Valley North SEZ being 10,000 acres in size and located wholly inside the Ely Springs Cattle Allotment, as requested by the Lincoln County Commission, see attached letter/comments.

It is imperative that the East Mormon Mountain SEZ, the Delamar SEZ, and the Dry Lake Valley North SEZ proposed 67,000, acres except the western 10,000 acres within the Ely Springs Cattle Allotment, be identified as Utility Scale Solar Exclusion Areas. The reviews undertaken in preparation of this SPEIS have identified these areas as unsuitable for utility scale solar development and must therefore be classified as Solar Exclusion Areas. To leave the door open for potential solar variance area would invite significant negative environmental and multiple use

impacts. It would not be possible to avoid or minimize or mitigate these negative impacts to both livestock grazing and existing multiple uses on this public land.

Development of solar energy in the Dry Lake Valley North SEZ in the western most 10,000 acres inside the Ely Springs Cattle Allotment would meet the DOE/BLM renewable energy generation goal. The solar energy created in this one area in Dry Lake Valley North would more than fill the current, and under construction, and three major transmission line projects in the foreseeable future in this valley.

The N-4 State Grazing Board recommends full development of the Dry lake Valley North SEZ of 10,000 acres first before any additional SEZ are developed or any variance areas are opened for development. State and Local input into this entire process is essential to assure quality development and compliance with NEPA and FLMPA requirements. A beneficial step in the right direction would be an energy park in Dry Lake Valley North inside the Ely Springs Cattle Allotment, which provides ready access to the existing Utility Corridors where solar, biomass, geothermal, and biofuel energy generation and transmission would be possible. This Energy Park should be developed with consideration for the training and operation needs of the United States Air Force in this valley.

The N-4 State Grazing Board will not support solar projects located outside the Ely Springs Cattle Allotment in Dry Lake Valley North in Lincoln County, Nevada.

The Draft Supplemental Solar PEIS identifies some 24 pending solar applications in the State of Nevada. The N-4 State Grazing Board recommends review and issuance or denial on each of these pending applications before any new or additional applications are accepted in State of Nevada, and especially the three proposed SEZs located in Lincoln County, Nevada.

It is most important that the planning effort to develop Future Protocols for new solar energy zones being considered have full coordination and consultation with the State of Nevada Energy Office and each Local and County government affected. These new Protocols should contain the requirement that any petition for a new SEZ must contain a statement of support from the State and County impacted.

Coordinating and consulting with the State of Nevada and the local governments involved should be part of the process used when identifying any New Solar Exclusion Areas. The institutional knowledge and expertise available locally will assist in time, money, and resource savings when this consultation takes place before the rule making, or site selection is made.

The N-4 State Grazing Board recommends reorganizing the five steps currently discussed in Appendix D "Future Protocols":

1. Assessing the Need for new SEZs,
2. Technical and Economic Feasibility,
3. Environmental Screening,
4. Other Additional Locally Relevant Screening, and
5. NEPA compliance.

We believe Local Involvement should be within the first TWO steps, preferably Step One, which would save all parties time, money, and resources. This should include working with grazing allotment permittees to explore ways to avoid or minimize impacts to existing grazing operations within the allotments where solar development is being considered. We do not support the current approach of notifying grazing permittees that some or all of their permit may be canceled to make way for solar development, as described in Section 2.2.1.1, page 2-5, lines 35-45. This approach is unacceptable to the N-4 Grazing Board and is contrary to the BLM's Multiple Use Mandate.

We urge you to make "Environmental Screening" Step Two. If sufficient environmental concerns are identified, it is certain there will be no need for the technical and economic feasibility studies, again saving time, money, and resources all around. Preparing the environmental screening in the Second Step would help identify the potential interference by the new SEZ with current multiple uses.

We suggest that at least one of the pre-scoping meetings be held inside the county most affected by this new proposal. We encourage the reduction to the greatest extent possible of the proposed project footprint.

We look forward to working with you in the future on our National Energy Independence goals. We advocate safeguarding No Net Loss of Grazing by using site-specific energy project locations with technology specific projects. Together we can do it. Please feel free to contact us for any information you may need.

Thank you,

Connie Simkins

Connie Simkins, Secretary
N-4 State Grazing Board
For Gracian Uhalde, Chairman

CS:kh

Enclosures: Lincoln County Commission Letter and Comments dated January 17, 2012

Thank you for your comment, Joshua Hart.

The comment tracking number that has been assigned to your comment is SEDDsupp20064.

Comment Date: January 26, 2012 11:49:49AM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20064

First Name: Joshua
Middle Initial: J
Last Name: Hart
Organization: Inyo County
Address: PO Drawer L
Address 2:
Address 3:
City: Independence
State: CA
Zip: 93526
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: SolorPEISCommentletter1-17-12final.pdf

Comment Submitted:

Please find attached comments from the Inyo County Board of Supervisors.

BOARD OF SUPERVISORS
COUNTY OF INYO

P. O. BOX N • INDEPENDENCE, CALIFORNIA 93526
TELEPHONE (760) 878-0373 • FAX (760) 878-2241
e-mail: pgunsolley@inyocounty.us

January 17, 2012

Supplement to the Draft Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue – EVS/240
Argonne, IL 60439

Re: Comments on Supplement to the Draft PEIS for Solar Energy Development in Six Southwestern States

Dear Gentlemen/women:

Inyo County has reviewed the Supplement to the Draft PEIS for Solar Energy Development in Six Southwestern States, and would like to take this opportunity to make the following comments on the document. We have previously requested coordination with the BLM to address and resolve inconsistencies with the Inyo County General Plan and approved policies pursuant with 43 CFR 1610.3-1(f) and we have not received a response; we reiterate this request.

Inyo County has commented a number of times on the fact that there are no Solar Energy Zones (SEZ) identified or planned for areas within the County. The County is, therefore, particularly supportive of comments within the Supplement that document provisions for added solar development opportunities. Specifically, the County supports:

- BLM's Efforts to Identify New SEZs: Section 2.2.2.2.5 notes that the "BLM intends to identify new SEZs and/or expand existing SEZs on an as-needed basis. The BLM has already initiated efforts to identify new SEZs in the states of California, Arizona, Nevada, and Colorado through ongoing state-based efforts…"
- Variance Process for Development Outside SEZs: Section 2.2.2.3.1 details a variance process which would allow utility-scale solar development outside of SEZs or other exclusion areas.

The County is supportive of both of the above-noted efforts, as they provide a way for areas within the County to be included as identified SEZ development zones, or, alternatively, provide a way for solar development to take place within the County, lacking any SEZ-identified zones through the PEIS process.

Also significant and important to the County – and which the County has commented on previously – is the fact that the Supplement notes that "the modified program alternative (BLM Preferred Alternative) emphasizes and incentivizes development within SEZs and proposes a collaborative process to identify additional SEZs" (p. 2-14). Inyo County looks forward to taking an active role with BLM in identifying additional new SEZ areas in the County.

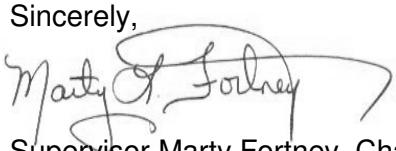
There is one section of the PEIS that is particularly troubling. Large portions of Inyo County are proposed for exclusion from solar development. These areas include lands that surround Pearsonville and Trona, and land within Rose Valley, Panamint Valley and Centennial Flat. Inyo County has identified each of these areas as having excellent potential for solar development. Excluding these areas from such development is directly contrary to specific policies of the County's General Plan, its fundamental planning document.

(Refer to the following Inyo County General Plan references: Goal ED-4, Goal Gov-10, Policy Gov-10.1)[1] County staff has communicated its concerns to the BLM, but BLM staff has been unable to explain why these areas are given Special Recreation Management Area designations, nor has it explained what criteria qualify areas with this designation for exclusion. This is vital information to the County, so that staff can identify ways to achieve consistency between BLM and County plans.

It is the County's position that finalizing the PEIS as currently proposed would be a direct violation of the BLM's duty to coordinate its planning efforts with Inyo County's planning documents, as directed by 43 CFR 1610.3-1 (c),(d) and (e). It is the County's understanding that BLM staff must identify where there are inconsistencies between federal and local plans, ensure that the plans are as consistent as possible, consult with the local government, in this case Inyo County, regarding the inconsistencies and the means to resolve those inconsistencies, and if consistency cannot be achieved, explain in the management plan how the inconsistencies were addressed and why they could not be resolved. Inyo County cannot support a plan that excludes large areas of the County from beneficial development, particularly where the necessity of that exclusion is unexplained.

Inyo County appreciates the opportunity to comment on the PEIS, but expects to engage directly with BLM staff for an explanation as to why these portions of the County are completely excluded from reasonable solar development. Until such coordination occurs, the County believes adoption of the PEIS would be unlawful.

Sincerely,



Supervisor Marty Fortney, Chairperson
Inyo County Board of Supervisors

cc: Greg Miller, Renewable Energy Program Mgr., BLM California Desert District
Clare Laufenberg Gallardo, California Energy Commission
Board of Supervisors, Inyo County
Kevin Carunchio, County CAO
Randy Keller, County Counsel
Joshua Hart, Inyo County Planning Director

[1] Refer to http://inyoplanning.org/general_plan/index.htm for the County's General Plan.

Thank you for your comment, cassie barr.

The comment tracking number that has been assigned to your comment is SEDDsupp20065.

Comment Date: January 26, 2012 12:01:38PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20065

First Name: cassie
Middle Initial: g
Last Name: barr
Organization: Sierra Club Wilderness Sub-Comm
Address: SF Bay Chapter
Address 2:
Address 3:
City: SF Bay Chapter
State: CA
Zip:
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

I want the prefered Solar Zone Alternative in the PEIS and please keep the Variances to protect desert wilderness systems.

Thank you for your comment, Paul Cook.

The comment tracking number that has been assigned to your comment is SEDDsupp20066.

Comment Date: January 26, 2012 12:06:05PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20066

First Name: Paul
Middle Initial:
Last Name: Cook
Organization: California State Assembly
Address: 34932 Yucaipa Blvd.
Address 2:
Address 3:
City: Yucaipa
State: CA
Zip: 92399
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: 01-25-12 Solar PEIS Supplement.pdf

Comment Submitted:

My comments are attached in a PDF document.

STATE CAPITOL
P.O. BOX 942849
SACRAMENTO, CA 94249-0065
(916) 319-2065
FAX (916) 319-2165

DISTRICT OFFICE
34932 YUCAIPA BLVD.
YUCAIPA, CA 92399
(909) 790-4196
FAX (909) 790-0479

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assemblymember.cook@assembly.ca.gov

Assembly
California Legislature

PAUL COOK
ASSEMBLYMEMBER, SIXTY-FIFTH DISTRICT

COMMITTEES
VETERANS AFFAIRS, CHAIR
ACCOUNTABILITY AND
ADMINISTRATIVE REVIEW
GOVERNMENTAL ORGANIZATION
SUNSET REVIEW

January 25, 2012

Solar Energy Draft PEIS
Argonne National Laboratory
9700 South Cass Avenue
EVS/240
Argonne, IL 60439

RE: Solar PEIS Supplement

To Whom It May Concern:

I represent the 65th Assembly District in the California State Legislature. My district includes portions of Joshua Tree National Park and the San Bernardino County desert communities of Yucca Valley, Joshua Tree, and Twentynine Palms. I am also a longtime resident of Yucca Valley. As you can imagine, I have a considerable amount of interest regarding the proposed Solar PEIS Supplement and how it will affect these communities.

While I support the effort to invest in a renewable energy future to create jobs and ensure energy independence, I believe that it must be done in a manner that does not jeopardize our local tourist economy, national parks, and wilderness lands.

The original Solar PEIS study, whose comment period closed last year, received over 80,000 comments from community stakeholders and organizations. These comments improved the new Solar PEIS Supplement, particularly in terms of protecting the resources of Joshua Tree National Park, which is linked inextricably to our local economy. In the supplement, there were improvements in the configuration of some of the proposed solar energy zones (SEZ), areas designated through extensive research and a comprehensive process that had a low potential for resource conflict. For example, the Iron Mountain SEZ was eliminated because of its sensitive ecological resources, lack of transmission lines, and proximity to Joshua Tree National Park. The Riverside East SEZ was decreased in size by 43,439 acres, which moved its border a substantial distance from the eastern boundary of Joshua Tree National Park.

However, the preferred alternative in the new Solar PEIS Supplement not only guides solar development into low conflict SEZs that have been identified through extensive research and stakeholder input, but also establishes a variance process that will allow development of projects outside of established SEZs on a case-by-case basis. This variance allowance affects over 20 million additional acres of public land. Further, the variance process is incongruous with the designation, process, and purpose of SEZs. I am writing to ask that you protect Joshua Tree National Park and our gateway communities by not allowing solar development on variance land. Additionally, if the preferred alternative with the variance land is adopted, I respectfully request that land in immediate proximity (5 miles) to Joshua Tree National Park be removed from consideration for solar energy project development.

As proposed in the Solar PEIS Supplement, large areas of variance land east of Twentynine Palms and the Marine Corps Air Ground Combat Center would be subject to solar development. Such development of these areas could potentially undermine tourism by unnecessarily denigrating the natural resource value of Joshua Tree National Park. A 2010 University of Idaho survey of Joshua Tree National Park visitors discovered that 90 percent favored maintaining the pristine views currently available at the park over solar development. That same year, the 1.4 million visitors to Joshua Tree National Park generated nearly $60 million in revenue for local gateway communities. Solar development on variance lands would likely interfere with a key reason visitors come to our area: scenic vistas and beautiful wildlife.

Finally, I believe that the length and highly technical nature of the Solar PEIS Supplement report merit an extension of 90 days for the public comment period. The original Solar PEIS report was over 11,000 pages and the Solar PEIS Supplement report, albeit shorter, is still an extremely lengthy and comprehensive document. This report contains extensive scientific data on environmental issues, cultural resources, and regulatory information. It is imperative stakeholders have sufficient time to analyze this information and make meaningful comments, which will ultimately ensure a sound and democratic process.

Sincerely,

Paul Cook
Assemblyman, 65th District

Thank you for your comment, Renee Castor.

The comment tracking number that has been assigned to your comment is SEDDsupp20067.

Comment Date: January 26, 2012 12:12:16PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20067

First Name: Renee
Middle Initial: W
Last Name: Castor
Organization: Desert Center Area Chamber of Commerce
Address: PO Box 502
Address 2:
Address 3:
City: Desert Center
State: CA
Zip: 92239
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

To whom it may concern;

I am concerned that the effect on the town of Desert Center and its residents has not been addressed.

The initial planned build for the solar farms starts in the middle of the Deset Center community. With 50 miles of unpopulated area between Blythe and Desert Center it is inconsiderate to start in the middle of the populated area. You have no buffer zones planned between housing and solar arrays. The Town of Desert Center has plans for growth to help support the influx of people to be employed during the build process of these arrays, however if you build the solar farms here first we won't be able to encourage business to move in to support your working staff.

We want to know why you chose to build in town first?Why you have no buffer zones planned between residential housing our businesses? How do you expect us to support housing and aminities for the influx of workers if solar fills every available piece of land with in a 5 mile radius of town? Would it not be cheaper for the solar farms to not have to bus their staff everyday. Would it not be better PR for BLM and the DOE to allow the town to work in partnership with the solar companies rather then build animosity and threatened law suits by starting the build out 5 miles east of town allowing the time and room to grow and build to support the workers that will be coming in for these solar farms?

You already know the saline content in the water is to high to support the thermalitic solar system you originally planned so starting there because of the water is not an excuse any more. The voltaic panels work just fine for the land between Blythe and Desert Center.

We are asking you to work with the Desert Center Area Chamber of Commerce to accomadate the solar farms and the hundreds of workers it will bring to our valley. We can work in partnership if you could understand it is a mutual need. Will you work with our community and move some of these solar projects just 5 miles east of the center of the valley so we can accomadate the influx of people? Will you work in conjuction with us or would you rather this be dragged out in an unnecassry legal battle?

You are more then welcome to come and attend a Chamber meeting. The first Wednesday of each month at 6pm or call and arrange a meeting with the chamber officers.

Thank you for your time,

Renee W Castor
760-485-8060

Thank you for your comment, Philip Simon.

The comment tracking number that has been assigned to your comment is SEDDsupp20068.

Comment Date: January 26, 2012 12:48:40PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20068

First Name: Philip
Middle Initial:
Last Name: Simon
Organization:
Address: box 9473
Address 2:
Address 3:
City: San Rafael
State: CA
Zip: 94912
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

I support the BLM preferred solar zone alternative for solar development applications. Also, “variances” for solar development outside of solar energy zones should be limited and additional exclusion areas should be added to ensure that our most important habitat and ecosystems are protected from solar development.

Thank you for your comment, Cree Rivera.

The comment tracking number that has been assigned to your comment is SEDDsupp20069.

Comment Date: January 26, 2012 13:27:25PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20069

First Name: Cree
Middle Initial:
Last Name: Rivera
Organization:
Address: 7186 Saddle back road
Address 2:
Address 3:
City: JT
State: CA
Zip: 92252
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

i want an extension to respond to Solar PEIS. I am completely against doing anything that affects the wildlife, environment or any resources negativly.
thank you

Thank you for your comment, Don Boering.

The comment tracking number that has been assigned to your comment is SEDDsupp20070.

Comment Date: January 26, 2012 13:38:43PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20070

First Name: Don
Middle Initial: L
Last Name: Boering
Organization: Yucca Mesa Home Owner
Address: [Withheld by requestor]
Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold address from public record
Attachment:

Comment Submitted:

Solar Plan Comment Period Extension Request concerning the deadline for public comments regarding the additional 20 million acres of “preferred” or “variance” lands for industrial solar fields in the high desert, east of Twenty-Nine Palms and the area between the Marine Corp Training HQs and the Nevada state line.

Please extend this comment period so that myself and others may review the paperwork. Also, PLEASE put me on your email AND snail mail address for all updates and notices of public meetings.

don boering
yucca valley, ca.

Thank you for your comment, Janna Perry.

The comment tracking number that has been assigned to your comment is SEDDsupp20071.

Comment Date: January 26, 2012 13:41:05PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20071

First Name: Janna
Middle Initial: k
Last Name: Perry
Organization:
Address: 77130 29 Palms Hwy
Address 2:
Address 3:
City: Twentynine Palms
State: CA
Zip: 92277
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

As I live in Wonder Valley the area of the added varience lands I would like a public debate regarding this issue. This will directly impact my property. and quality of life.

Thank you for your comment, Cristina Cabeza-Kinney.

The comment tracking number that has been assigned to your comment is SEDDsupp20072.

Comment Date: January 26, 2012 13:56:17PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20072

First Name: Cristina
Middle Initial: M
Last Name: Cabeza-Kinney
Organization:
Address: POB 543
Address 2:
Address 3:
City: Crestone
State: CO
Zip: 81131
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

I speak for distributed solar as an answer to our energy crises. We are in global crises because of corporate take over of the things that are our inherent right: food, shelter, water, energy, livelihood. As a valley in a time of critical mass, it is imperative that we think globally and act locally. I live in this valley because it is remote and limited intrusion. Industrial solar has the potential to interfere with my/our deeply held beliefs about this place. Rethink this as we all are rethinking everything....TOO, TOO BIG!! The emerging models are going to simpler...let's be in alignment with what the future is showing us...how can we sustain for the future generations? How can we use our ingenuity to make more efficient, locally owned/maintained systems? Please reconsider...

Thank you for your comment, Janine Blaeloch.

The comment tracking number that has been assigned to your comment is SEDDsupp20073.

Comment Date: January 26, 2012 14:24:05PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20073

First Name: Janine
Middle Initial:
Last Name: Blaeloch
Organization: Solar Done Right
Address: c/o PO Box 95545
Address 2:
Address 3:
City: Seattle
State: WA
Zip: 98145
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: SUPP DPEIS FINAL.pdf

Comment Submitted:

Solar Done Right comments attached

SOLAR DONE RIGHT

Contact: Janine Blaeloch,
Western Lands Project and Solar Done Right
blaeloch@westernlands.org

To: US Bureau of Land Management
Supplemental Draft Solar PEIS Comments
Argonne National Laboratory
9700 S. Cass Avenue, EVS/240
Argonne, IL 60439

Submitted electronically via: http://solareis.anl.gov/involve/comments/index.cfm

January 27, 2012

RE: Comments on the Supplemental Draft Solar Programmatic Environmental Impact Statement

To whom it may concern:

On behalf of Solar Done Right, its members and associates, we submit the following comments on the Supplemental Draft Solar Programmatic Environmental Impact Statement (DPEIS).

These comments also constitute those, each and collectively, of the Western Lands Project, Basin & Range Watch, the Desert Protective Council, Desert Biodiversity, and the San Luis Valley Renewable Communities Alliance, all of which are founding organizations in the Solar Done Right coalition.

Solar Done Right and its affiliates hold that there is a proper hierarchy of priority for strategies to end our nation's addiction to fossil fuels. We should begin the transition by using the most cost-effective strategies for renewable energy production, which also happen to be the least environmentally destructive.

In descending order of priority:

- **Reduce demand.** According to some estimates, an aggressive program of conservation and energy efficiency using currently available technology could reduce US power consumption by one third or more. A recent efficiency regulation on power cords for electronics chargers in the state of California is projected to save as much power as that used by 350,000 homes each year. The Rocky Mountain Institute estimates that the application of California's efficiency standards nationwide could reduce coal burning by two thirds or more.

- **Generate renewable energy at a smaller scale (1 to 100kW) at or near the point of use.** Distributed solar generation on homes and businesses is cost-competitive, more reliable, and does not incur line losses or heat-related reductions in output. Such losses may equal or exceed any increased insolation found at remote sites, so (net) capacity factors in urban load centers are similar to those of large desert installations. Installation time for local projects is measured in weeks rather than years. Ratepayers benefit through improved property values, reduced utility bills and/or sales of power into the grid. Germans installed 2,000 MW of rooftop solar in December 2011 alone, thanks to a feed- in tariff that has proven to be a dramatic success.

- **Generate renewable energy on a larger scale (100kW-20 MW) within the built environment.** Most cities and counties possess large industrial spaces including warehouse roofs, brownfields, large parking lots, airports, depleted and fallowed agricultural lands, and other areas that could be either converted to or augmented with renewable energy production using the same modular technology used for remote industrial solar-PV. Emerging technologies offer promise for additional methods to incorporate solar energy production into new residential and commercial construction and store power cleanly and efficiently. These projects have the additional benefit of being appropriately sized and serving as "community solar gardens," which could ameliorate some of the social and economic inequities our energy infrastructure perpetuates.

It should be noted that a focus on both large- and small-scale distributed generation in the built environment is anticipated to create many more jobs than the remote, centralized model now being pursued. A UC Berkeley study published in 2010 concluded that if California instituted a feed-in tariff for projects up to 20 MW in order to achieve its Renewable Portfolio Standard, it would create 3 times as many jobs as without, and would result in $2 billion in tax revenues and billions in new investment.

The approach described above can meet our electrical energy needs without sacrificing biologically valuable desert and grassland ecosystems with large-scale solar power plants.

Should these common-sense methods fail to meet our society's long-term demand for renewable energy, centralized solar power plants should be the very last resort, and sited only on available disturbed, degraded and contaminated lands that offer little carbon sequestration, wildlife habitat or other natural resource values.

Supplement offers no improvement

A fundamental error in the Administration's approach to renewable energy has been to assign a 21st-century task to a Department of Interior that still resides in the 19th century. This choice not only perpetuates the error of using public lands as a sacrifice area for industrial exploitation, it denies this country the opportunity to swiftly implement effective and environmentally sound renewable-energy systems.

With 253 million acres in BLM-managed lands alone, it may seem that the public lands, and their potential for use, are endless. Yet much of this area is already damaged or fragmented by mining, urban encroachment, roads, oil and gas operations, transmission, wind and geothermal developments, livestock grazing, motorized recreation, and other uses. Large, contiguous areas that retain their ecological integrity are increasingly rare, and yet these areas are acutely threatened by large-scale uses such as industrial solar, which will essentially privatize the land and convert healthy and resilient multiple-use lands into single-use, permanent industrial zones.

The Bureau of Land Management's outmoded, entrenched, dangerously utilitarian approach to our public land is nowhere better demonstrated than in its refusal to put meaningful restrictions on the territory it makes available to industrial-scale solar developers.

The purported improvements introduced in the Supplement are rendered meaningless by the fact that the overall amount of public land kept available in the agency's Preferred Alternative is reduced by only 6 percent--from 21,581,154 acres to 20,324,863 acres.

Yet even if the BLM were to select the Modified Solar Energy Zone alternative--reduced from 677,384 acres to 285,417 acres, it would be unacceptable. Considering the damage to desert sites, concomitant transmission requirements, and the fact that far superior alternatives exist, there is simply no reason to wage this industrial-scale assault on public lands.

This course poses great peril to our rich desert ecosystems, to ratepayers, and to taxpayers—who are unwittingly acting against their own interests by footing the bill through subsidies (amounting so far to about $10.5 billion just in federal loan guarantees) and the myriad, cascading, externalized costs that will flow from this policy.

BLM has no mandate

The drive for solar development on public lands has been predicated on what the BLM and others repeatedly refer to as a "mandate" in the 2005 Energy Policy Act (PL 109-58). Yet the short provision regarding renewable energy on public lands in the legislation (Section 211) aspires to but does not require action:

"It is **the sense of the Congress** that the Secretary of the Interior **should**, before the end of the 10-year period beginning on the date of enactment of this Act, seek to have approved non-hydropower renewable energy projects located on the public lands with a generation capacity of at least 10,000 megawatts of electricity. "

The difference between a sense of Congress and a mandate goes beyond semantics. A sense of Congress resolution has no force of law. And while that does not render the provision irrelevant, neither does it provide the mandate upon which the Administration has built its public land-focused renewable energy policy and upon which the Secretary of Interior has based the PEIS.

Amended Federal Order 3285A1, issued by DOI Secretary Salazar on February 22, 2010, is also cited as the basis for using public lands for solar development. The Order takes its authority from the Energy Policy Act of 2005 (Section 3) and therefore also constitutes a DOI policy choice,

rather than a legally binding Order. Nevertheless, the Order states that “as the steward of more than one-fifth of our Nation’s lands,” the department has a significant role in coordinating and ensuring environmentally responsible renewable energy production….” The Order clearly states that the department should pursue solar leasing “while protecting and enhancing the Nation’s water, wildlife, and other natural resources.”

Given the significant impacts from large-scale concentrating solar that cannot be mitigated, the goal of “protecting and enhancing the Nation’s water, wildlife, and other natural resources” while implementing large scale “environmentally responsible” solar development, cannot be met through any of the alternatives being analyzed in the Supplemental DPEIS.

BLM’s scope, purpose, need, and alternatives are unreasonably narrow

The National Environmental Policy Act (NEPA) requires agencies to "[r]igorously explore and objectively evaluate all reasonable alternatives." 40 C.F.R. § 1502.14. The courts have found that "The `existence of a viable but unexamined alternative renders an environmental impact statement inadequate.'" And that the "touchstone for our inquiry is whether an EIS's selection and discussion of alternatives fosters informed decision-making and informed public participation."

As defined in both the DPEIS and the Supplement, the BLM’s scope is to analyze “use of multiple solar energy technologies at utility-scale over the next 20 years on lands within six southwestern states,” and its purpose and need, “to respond to the high interest in siting utility-scale solar energy development on public lands.” But the scope, purpose and need, and alternatives are all far too narrow to foster **informed** decision-making and public participation.

Truly informed decision-making and public involvement require an analysis of alternatives encompassing massively deployed PV in the built environment as well as siting solar development on the nation's millions of acres of disturbed, degraded, and contaminated lands.

The far saner and more effective alternative to public lands and ecosystem destruction is distributed generation-- solar PV installed on commercial and residential rooftops, parking lots, highway easements, and virtually any site in the built environment that has suitable space.

In addition, it is known that there are suitable sites for solar energy developments on a wide array of damaged, degraded, previously developed, and contaminated lands. The Environmental Protection Agency (EPA) Office of Solid Waste and Emergency Response has been identifying abandoned mine lands, brownfields, Resource Conservation and Recover (RCRA) sites, and federal and non-federal Superfund sites that may be suitable for solar and other non-fossil-fuel energy projects. This program, RE-Powering America’s Lands, should have been front and center in the PEIS.

In its original scoping letter on the Programmatic EIS, EPA pointed out the efficacy of siting renewables on hundreds of thousands of acres of contaminated sites around the country. Following the same methods used by the National Renewable Energy Lab to identify suitable concentrating solar generation sites, EPA has identified a "technical potential" of 920,000 MW of solar generation.

In addition to citing the EPA program, in our DPEIS comment letter we listed numerous other efforts that have pinpointed damaged, developed, or contaminated public and private lands suitable for solar development, adding up to about 380,000 acres just in California.

Instructional Memorandum No. 2011-059i issued by the Director of the BLM acknowledges that in limited circumstances the agency may choose to evaluate a non-federal land alternative or different technology alternative raised through scoping, “to the extent necessary to support a decision regarding the pending application.” The BLM’s dismissive stance regarding alternatives to its own narrow proposals, however, suggests that this would be used exclusively to argue for the superiority of the public-land, remote, concentrated solar projects it favors. To comply with NEPA, the BLM must analyze these sites and technologies as the legitimate, far superior, alternatives they are.

BLM must look outside its jurisdiction

The DC Circuit Court of Appeals has found an EIS inadequate for failing to consider eliminating oil import quotas as an alternative to the sale of oil leases on the Outer Continental Shelf, even though the alternative was outside the jurisdiction of Interior. No PEIS was prepared in that instance, but here there is an even stronger case to consider broader alternatives, as a PEIS is meant to address broader policy decisions rather than a specific proposed action.

As the Council on Environmental Quality has stated,

> "Section 1502.14 [of the NEPA regulations] requires the EIS to examine all reasonable alternatives to the proposal. In determining the scope of alternatives to be considered, the emphasis is on what is "reasonable" rather than on whether the proponent or applicant likes or is itself capable of carrying out a particular alternative. Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.

And,

> An alternative that is outside the legal jurisdiction of the lead agency must still be analyzed in the EIS if it is reasonable. A potential conflict with local or federal law does not necessarily render an alternative unreasonable, although such conflicts must be considered. Section 1506.2(d). Alternatives that are outside the scope of what Congress has approved or funded must still be evaluated in the EIS if they are reasonable, because the EIS may serve as the basis for modifying the Congressional approval or funding in light of NEPA's goals and policies. Section 1500.1(a).

Conclusion

In addition to turning to degraded, contaminated sites, there is vast potential to get outmoded, environmentally damaging solar off public lands in the alternative of distributed generation through solar PV installations in the built environment.

The PEIS dismisses alternatives such as distributed generation on the basis of defining the purpose and need as "[responding] in a more efficient and effective manner to the high interest in siting utility-scale solar energy development on public lands." This purpose and need statement, and the alternatives formulated for it, are inappropriately focused on serving corporate interests rather than on the urgent need to reduce our reliance on fossil fuels in the least damaging, most affordable and sustainable way.

The PEIS process has cost millions of public dollars, absorbed the time and energy of thousands of people, and yet has utterly failed to move us one inch closer to an effective, efficient, environmentally responsible renewable-energy policy.

We call on the BLM to either expand its analysis away from industrial-scale development on public lands or relinquish its role as the ill-chosen standard bearer for renewable energy.

Sincerely,

Janine Blaeloch, Western Lands Project

On behalf of Solar Done Right co-founding organizations and affiliates:
Terry Weiner, Desert Protective Council
Bill Powers, Powers Engineering
Laura Cunningham and Kevin Emmerich, Basin & Range Watch
Chris Clarke, Desert Biodiversity
Ceal Smith, San Luis Valley Renewable Communities Alliance
Sheila Bowers
Jim Andre

Thank you for your comment, Linda Joseph.

The comment tracking number that has been assigned to your comment is SEDDsupp20074.

Comment Date: January 26, 2012 14:47:25PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20074

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Attachment: BLMSolar-PEIS-1-12.pdf

Comment Submitted:

Saguache County is pleased to be a Cooperating Agency in the PEIS process, and respectfully submits these comments on the Supplement.

SAGUACHE COUNTY GOVERNMENT

501 Fourth Street • P. O. Box 655

Saguache, Colorado 81149

Phone: (719) 655-2231 • Fax: (719) 655-2635

January 23, 2011

Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue, EVS/240
Argonne, IL 60439

Dear Ms. Stewart,

Saguache County is pleased to be a Cooperating Agency with the Department of Energy (DOE), the Department of the Interior (DOI), and Bureau of Land Management (BLM), on the Solar Energy Development Programmatic Environmental Impact Statement (Solar PEIS). The Saguache County Board of County Commissioners (Board) is writing to comment on Supplement to the Draft Solar Energy Programmatic Environmental Impact Statement. We would like to extend our appreciation and congratulations on the many changes in this iteration in response to public input to date.

We are pleased with and support the ongoing development of several key areas of local concern, as presented in the preferred alternative in the supplement, such as -

> **"2.2.1.2 Adaptive Management and Monitoring**
> As described in the Draft Solar PEIS (Appendix A, Section A.2.1.1 of that document), the BLM (recognizing that data regarding the actual impacts of solar energy development on various resources are still limited) will develop and incorporate into its Solar Energy Program an adaptive management and monitoring plan to ensure that data and lessons learned about the impacts of solar energy projects will be collected, reviewed, and, as appropriate, incorporated into the BLM's Solar Energy Program in the future. Changes to the BLM's Solar Energy Program resulting from adaptive management and monitoring (e.g., modifications to exclusion areas) will be subject to appropriate land use planning, environmental review, and/or policy development."
>
> "**2.3.1 Impacts of the Modified Solar Energy Development Program Alternative**
> As an element of the proposed program, the BLM would implement an adaptive management and monitoring plan for solar energy development developed in coordination with potentially affected natural resource management agencies, to ensure that new data and lessons learned about the impacts of solar energy projects would be reviewed and, as appropriate, incorporated into the program through revised policies and design features (see Section 2.2.1.2 of this Supplement). Changes to the BLM's Solar Energy Program will be subject to appropriate environmental analysis and land use planning."

Given the prototype nature of solar technology, and unprecedented large-scale, long-term impacts - adaptive monitoring and management, and attention to Design Features (section 2.2.1.3), are prudent strategies, which allow and encourage best practices to emerge collaboratively, as experience is gained, and the industry, technologies and mitigation measures progress.

> "**2.2.2.2 Proposed Solar Energy Zones**
> The BLM will continue to refine the list of SEZ-specific design features based on comments received on the Draft Solar PEIS, ongoing coordination with cooperating agencies, additional data collection described in SEZ action plans, and comments received on this Supplement."

The Saguache County Board of Commissioners works closely with our local and regional Public Lands Managers, and, wishes to serve as a Cooperating Agency with the local BLM in the site-specific NEPA process for development applications at the DeTilla Gulch SEZ, or other areas in our County, should any be selected for development. The changes made in the PEIS Supplement effectively addresses concerns we shared previously about this location, which lies within our County near the County seat, the Town of Saguache. At any given time, there may be County, town and Valley land use plans of various types, pertinent to BLM Solar development. This is the knowledge the County brings to the table, as a Cooperating Agency. Counties have a role in the designation process for future solar energy zones, within their jurisdictions.

> "**3.2 ACTION ALTERNATIVE—DOE'S PROPOSED PROGRAMMATIC** 23 **ENVIRONMENTAL GUIDANCE, 3.2.1 General Mitigation Measures"**

The final plan should emphasize siting projects in low conflict zones and avoiding development on public lands that are essential for wildlife, recreation, tourism and other uses by local residents and visitors.

Thank you - for this opportunity to participate as a Cooperating Agency; for your consideration of our comments; and, for the time and tremendous effort devoted to developing the Solar PEIS.

Sincerely,

Saguache County Commissioners

Sam Pace | Mike Spearman, Chair | Linda Joseph

Thank you for your comment, Teresa Motley.

The comment tracking number that has been assigned to your comment is SEDDsupp20075.

Comment Date: January 26, 2012 15:20:42PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20075

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Attachment: Solar Energy Draft PEIS filing_01-26-12_CCDOA Comments on Supplemental Draft Solar Energy PEIS..pdf

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January 26, 2012

VIA ELECTRONIC SUBMISSION
http://solareis.anl.gov

Solar Energy Draft PEIS
Argonne National Laboratory
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Argonne, IL 60439

RE: Clark County, Nevada Department of Aviation Comments on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

Dear Staff:

The Clark County, Nevada Department of Aviation (CCDOA) previously filed scoping comments in response to the May 29, 2008 Notice of Intent for the Programmatic Environmental Impact Statement (PEIS) related to solar energy development on Bureau of Land Management (BLM)-administered land in six western states. On September 14, 2009, CCDOA filed comments on Additional Public Scoping for the PEIS to Develop and Implement Agency-Specific Programs for Solar Energy Development. On April 14, 2011, CCDOA filed comments on the Draft PEIS (DPEIS). BLM has responded to most of CCDOA's concerns, but the Supplement to the DPEIS published on October 28, 2011 (Supplement), raises some new issues. Therefore, CCDOA submits the following comments for consideration by the BLM and Department of Energy (DOE) as they finalize the PEIS and complete their environmental review.

COMMENTS

1. *Protection of the Congressionally-Designated Airport Environs Overlay District for the Southern Nevada Supplemental Airport*

In the original DPEIS, BLM proposed that all Special Recreation Management Areas (SRMAs) would be excluded from new solar energy project development. However, in the Supplement, BLM proposes to remove Nevada SRMAs from this general exclusion. Supplement at 2-16, 2-17 note b. Instead, Nevada SRMAs would be categorized as Variance Areas, open to solar energy projects on a case-by-case basis. Supplement at Figure 2.3-4.

The Jean Lake Roach Lake SRMA in southern Nevada includes approximately 17,000 acres of land that has been specifically designated for transfer to Clark County upon approval of the proposed Southern Nevada Supplemental Airport (SNSA). As noted in our scoping comments, filed September 14, 2009, the Clark County Conservation of Public Land and Natural Resources Act of 2002 provides that upon the approval of the SNSA project, the 17,000 acres surrounding the Airport Site shall be transferred without consideration to Clark County as an Airport Environs Overlay District and are to be managed "consistent with" 49 U.S.C. § 47504.[1] Therefore, to the extent that BLM considers lands within the Overlay District acres as open to new utility-scale solar development projects under the rules for the variance process, *e.g.*, as described at Section 2.2.2.3.1 of the Supplement. BLM should provide a mechanism in that process to ensure that no element of any solar project would compromise BLM's ability to satisfy Congress's express direction for the future use of the SNSA and the Overlay District.

Although the pre-application meetings required as part of the variance process would provide an opportunity for BLM and CCDOA to "discuss" the status of the Overlay District with a solar applicant and to "initiate and ensure early coordination," (Supplement at 2.2.3.1, p. 2-34), please provide a stronger mechanism suitable to the special status of the Overlay District. This mechanism should require documentation from the applicant that both CCDOA and the Federal Aviation Administration (FAA) have been consulted and agree that the proposed solar energy facility would not interfere with construction and operation of the SNSA and its associated infrastructure. The variance process already contains a requirement that the applicant submit documentation that the proposed project would be located in an area where minimal conflict with adjacent lands is likely. Supplement p. 2-35. This would be an appropriate stage of the process to require specific documentation regarding proposals for projects in the congressionally-designated Overlay District.

2. *Desert Tortoise Variance Process Requirements*

CCDOA has questions about the Desert Tortoise Variance Requirements discussed in Section 2.2.2.3.1 (p. 2-35, 2-36) of the Supplement and in particular, about the required 3-mile wide, minimally-disturbed connectivity corridor.

- Please clarify how BLM defines "proposed desert tortoise connectivity areas" and how it arrived at the particular areas shown in Figure 2.2-2 of the Supplement.
- Please explain whether these "connectivity areas" must be included in the relevant BLM Resource Management/Land Use Plans, or whether the public has any other opportunity to comment on the specific parameters of any particular connectivity area.
- There is debate within the scientific community over the appropriate width of connectivity corridors. Please provide a basis for the agency's conclusion that a wildlife

[1] PUB. L. 107-282 at § 501. In turn, Section 47504 provides for the authorization of airport noise compatibility programs that contain: "...measures the [airport owner] has taken or proposes to take to reduce existing noncompatible uses and prevent introducing additional noncompatible uses in the area covered by the map. The measures may include ... *acquiring land, air rights, easements, development rights, and other interests to ensure that the property will be used in ways compatible with airport operations*." 49 U.S.C. § 47504(a)(2)(E) (emphasis added).

corridor must be three miles wide for the desert tortoise to satisfy the requirement that connectivity be preserved.

3. *Aviation Safety Issues*

As CCDOA stated in its April 14, 2011, comments on the DPEIS, CCDOA appreciates BLM and DOE's attention to the potential aviation safety hazards associated with solar energy development in the vicinity of aviation facilities, particularly airports. *See* DPEIS at pp. 4-15, 5-18, 5-19. We are encouraged by the inclusion of a "Glint and Glare Assessment, Mitigation, and Monitoring Plan" as one of the design features to be considered with proposed solar energy projects. DPEIS, Appendix A at A-35, A-37, and A-39. However, we continue to recommend strongly that additional mitigation measures, such as those outlined at DPEIS Section 5.6.3 requiring consultation with the FAA and local airports regarding *any* potential impacts on aviation, be included in the Final PEIS.

Thank you for your attention to CCDOA's concerns. Please contact Mark Silverstein on my staff at (702) 261-5709 or marksi@mccarran.com with questions or inquiries.

Sincerely,

TERESA R. MOTLEY, AICP
Airport Planning Manager

cc: Randall Walker
Rosemary Vassiliadis
Mark Silverstein
Philip Rhinehart
David Kessler

Thank you for your comment, Rebecca Schwendler.

The comment tracking number that has been assigned to your comment is SEDDsupp20076.

Comment Date: January 26, 2012 15:43:19PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20076

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Comment Submitted:

January 26, 2012

Linda J. Resseguie
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Submitted electronically at http://solareis.anl.gov/involve/comments/index.cfm

Re: Comments on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (DOE/EIS-0403D-S

Dear Ms. Resseguie:

The National Trust for Historic Preservation (National Trust) commends the efforts of the Bureau of Land Management (BLM) to respond to the many public comments on its draft solar programmatic environmental impact statement (Draft PEIS) by crafting a generally strong Supplement, which elevates protections for cultural resources. In particular, we are pleased to see the withdrawal from consideration, or the substantial reduction of, several proposed solar energy zones (SEZs) which, if developed, would have impacted significant cultural resources. We also commend the BLM for conducting thorough National Environmental Policy Act reviews of SEZs, requiring Class II or III cultural resource inventories of project areas proposed in variance applications, and requiring consultation under the National Historic Preservation Act as part of the analysis of new SEZs. Furthermore, we appreciate BLM's commitment to completing the PEIS in 2012 and its acknowledgment of the Department of Interior's authority and discretion to deny applications for rights-of-way on the public lands. Our comments on the Supplement focus on what we see as still inadequate protections for current and potential units of the National Trails System.

Interests of the National Trust

Congress chartered the National Trust in 1949 as a private nonprofit organization to "facilitate public participation" in historic preservation and to further the purposes of federal historic preservation laws. 16 U.S.C. §§ 461, 468. With the support of 125,000 members around the country, the National Trust works to protect significant historic sites and to advocate historic preservation as a fundamental value in programs and policies at all levels of government. In addition to our headquarters in Washington, D.C., the National Trust operates thirty historic sites open to the public, two field services offices, and numerous field offices throughout the country. The National Trust also maintains a list of America's Most Endangered Historic Places, to which eleven properties are annually added. In 1995, the National Trust placed nearby South Pass on this list, due to the lack of adequate protection of this pristine area of emigrant trails from development.

I. BLM should treat national historic trails as equal units of the National Landscape Conservation System.

When Congress designated the National Landscape Conservation System (Conservation System) it explicitly recognized that the system shall include each area that is "designated as a national scenic trail or national historic trail designated as a component of the National Trails System" 16 U.S.C. § 7202(b)(1)(D). Additionally, the Supplement acknowledges that national historic trails (NHTs) are units of the Conservation System [Supplement at 1-10] and BLM Instruction Memorandum (IM) 2011-061 states that solar "development must…be consistent with protection of areas and resources of national interest, including the BLM National Landscape Conservation System." However, at the same time, the Supplement and the IM propose to lessen protections for NHTs relative to other components of the Conservation System, a prescription we find inconsistent with Congress' intent. For instance, while both documents consider other units of the Conservation System to be areas of "High Potential for Conflict," they consider NHTs to be areas of only "Medium Potential for Conflict" because of their "linear nature" [Supplement at I-10] and the idea that they "have resource conflicts that can potentially be resolved" [IM].

Pursuant to Secretarial Order 3308, lands within the NLCS are to be managed with a priority on protecting the values for which they were designated – i.e., conservation of historical values. The 15-Year Strategy for the NLCS reinforces this by stating that the "conservation, protection, and restoration of the NLCS values is the highest priority in NLCS planning and management, consistent with the designating legislation or presidential proclamation." NLCS Strategy at 8. Furthermore, the Federal Land Policy and Management Act (FLPMA) requires BLM to manage public lands under multiple-use principles *unless,* as with NHTs, an area has been designated by law for specific uses, in which case the BLM must manage the land for those specific uses. 43 U.S.C. § 1732(a). In other words, the BLM manages NHTs not under the FLPMA multiple-use mandate, but rather under the language of the legislation establishing the NHTs, the National Trails System Act (Trails Act), 16 U.S.C. § 1241 et seq. (1968). Since the Trails Act requires the BLM to develop "a protection plan for any high potential historic sites or high potential route segments" of NHTs, 16 U.S.C. § 1244(f)(3), the BLM must prioritize such a protection plan over other uses in the Draft PEIS.

Recommendation:

- While the origin of the discrepancy between protection of NHTs and other units of the Conservation System is not the Supplement itself, we strongly recommend that the BLM remedy this inconsistency in the treatment of units

in the Supplement by, at a minimum, elevating high potential route segments of NHTs to "High Potential for Conflict."

II. BLM should increase the width of the avoidance area for national historic trails.

The Supplement states that the standard avoidance width for NHTs is 0.25 miles, except where a corridor of a different width has been established [Supplement at 2-16]. We commend BLM on establishing a minimum avoidance corridor for NHTs, but given the importance of setting for the integrity and significance of NHTs, and the dramatic visual impacts that utility scale solar developments have on resources that surround them, we believe BLM should add protections for trails beyond that narrow corridor. Such protections should be commensurate with the most up-to-date strategies for protecting NHTs, such as those included in the draft environmental impact statement/resource management plan (Draft EIS/RMP) revision recently published by the Lander Field Office of the BLM in Wyoming. For example, the preferred alternative in the Draft EIS/RMP prescribes specific physical and visual protections for trails at 0.25 miles, 1 mile, 3 miles, 5 miles, and more than 5 miles, depending on the development activity.

Recommendations:

- Using BLM's Visual Resource Management System, protections for NHTs against impacts from utility scale solar energy development should include, at a minimum, limitation of visual contrasts to "weak contrast" for high potential route segments.
- BLM should consistently require mitigation measures that reduce visual impacts to current and potential (e.g., West Fork of the Old Spanish Trail) NHTs. Such measures could include imposing limits on the height of power poles, promoting non-penetrating and low profile racking/panel photovoltaic systems, and, where appropriate, using low visibility fencing, such as black fencing in lieu of uncoated galvanized fencing, and golf netting.
- Because transmission lines servicing the solar installations can also cause direct and indirect impacts to trails, BLM should require applicants to align power poles within existing easements and rights-of-way for existing power lines, where feasible.
- Where applicable, BLM should require developers to explore agreements with adjacent landowners to eliminate transmission line crossing of public lands in locations where they could directly or indirectly impact high potential route segments of NHTs.

III. BLM should consider modifying additional SEZs to reduce impacts to NHTs.

As mentioned above, we commend BLM for removing or modifying several proposed SEZs to reduce impacts to significant resources. However, we believe that BLM

should re-examine the extent of adverse impacts of some remaining SEZs to NHTs, given the NHTs' national significance and inclusion in the Conservation System, and modify those SEZs accordingly.

Recommendations:

We recommend that BLM modify the following SEZs to reduce impacts to national historic trails:

- *De Tilla Gulch:* We commend BLM for suggesting inventory and viewshed analysis to help determine potential impacts to the Old Spanish NHT and the West Fork of the Old Spanish Trail from this SEZ. Yet, we feel that the strong visual impacts to the trails that are guaranteed within approximately 5 miles of the SEZ remain unacceptable. Therefore, we recommend that BLM push, at a minimum, the southeastern boundaries of the SEZ back at least 0.5 miles, as well as implement strong mitigation measures to further reduce visual impacts.
- *Dry Lake:* We commend BLM for dramatically reducing the size of this proposed SEZ, in part to avoid impacts to significant cultural resources. However, we still recommend that BLM move the southeastern boundary of the SEZ to the west of I-15 to help reduce impacts to the Old Spanish Trail/Mormon Road site, which is listed in the National Register as a district.

IV. BLM should conduct a Class II cultural resources inventory of at least 10% of each currently proposed SEZ.

We strongly support BLM's recommendation for the use of Class II sample surveys to better understand cultural resources located within proposed SEZs. However, we feel that 5% minimum survey coverage, as planned for SEZs in Arizona, California, and Nevada [Supplement at 2-22] is inadequate. This inadequacy is illustrated by the fact that data collection efforts recommended to reduce uncertainty about potential impacts from several of the proposed SEZs (e.g., Brenda, Gillespie, Imperial East, Riverside East, Antonito Southeast, De Tilla Gulch, Dry Lake Valley North, Gold Point) involve acquiring a *10% sample* of each SEZ [Supplement at C-19, C-36, C-51, C-77, C-96, C-112, C-203, C-218].

Recommendations:

- BLM should require consistent Class II sampling of, at a minimum, 10% of current SEZs. This information should be used to help guide solar development away from areas of significant cultural resources and/or to enact avoidance and mitigation strategies.
- BLM should require consistent Class II sampling of, at a minimum, 20% of future proposed SEZs to help ensure avoidance of areas of significant cultural resources. This increased percentage of inventory should be feasible with future funding allocations and longer planning time, and it will provide a more accurate model of the probable locations of significant cultural resources.

Conclusion

When planning for large-scale solar energy development on federal public lands, the BLM must consistently prioritize the protection of outstanding cultural resources, including—but not limited to—significant concentrations of prehistoric and historic archaeological sites, historic trails, and Native American traditional cultural properties and sacred sites.

We appreciate the opportunity to provide these comments and we look forward to participating further in the PEIS process. Please contact us at (303) 623-1504 with any questions or concerns regarding these comments.

Sincerely,

Rebecca Schwendler, PhD
Public Lands Advocate and Archaeologist, Denver Field Office

Brian Turner
Senior Field Officer/Attorney, San Francisco Field Office

Cc: Nancy Brown, BLM Liaison, Advisory Council on Historic Preservation
Lee Webb, Dep't of Energy Liaison, Advisory Council on Historic Preservation
Caroline Hall, Advisory Council on Historic Preservation
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Ronald M. James, Nevada SHPO
Jan Biella, Acting New Mexico SHPO
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Thank you for your comment, Donna Charpied.

The comment tracking number that has been assigned to your comment is SEDDsupp20077.

Comment Date: January 26, 2012 16:07:21PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20077

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"Don't Waste Our Desert"

January 27, 2012

RE: Comments to Solar Supplemental Programmatic Environmental Impact Statement.

Dear Sirs,

This comment letter to the Supplemental Programmatic Environmental Impact Statement ("SPEIS") for solar energy development in six western states is submitted by the Desert Protection Society ("DPS").

The Desert Protection Society ("DPS") is a 501(c) (3) organization (formerly known as Citizens for the Chuckwalla Valley ["CCV"]), made up of residents of Eagle Mountain/Desert Center, Native Americans, local environmental activists from San Bernardino, Imperial, San Diego, and Riverside Counties. DPS, an environmental justice and conservation organization was formed in 1990 to prevent the World's largest garbage dump from being built across the street from the Eagle Mountain Elementary School, and on the doorstep of Joshua Tree National Park. Our mission was a success when the US Supreme Court refused to hear the Polluter's case. We have since expanded our mission to include other potentially damaging proposals and actively participate in the decision making process for proposals that include, but are not limited to water storage projects, power generating projects, questionable land use issues, and other projects that have the potential to harm desert communities and the environment in and around Joshua Tree National Park.

DPS and its Board of Directors (several of whom live and farm in the Chuckwalla valley for over 30 years) are deeply concerned with our governments' attempts to industrialize the entire Chuckwalla Valley with solar swaths for the profit of a few and the demise of many. Approximately 180,000 acres will be destroyed in the Chuckwalla Valley from Desert Center to Blythe with this scheme. Despite your denials, this is an environmental justice issue gone rampant !

We incorporate as though fully contained herein, the comments submitted by Alfredo Acosta Figueroa Basin and Range Watch, and Solar Done Right.

ALTERNATIVES

As with the Draft PEIS, the SPEIS fails to consider a reasonable range of alternatives, in violation of NEPA. *Id.* at 20-23. A federal agency may not employ criteria derived from the agency's preferred alternative as a means of rejecting other reasonable alternatives. *Idaho Conservation League v. Mumma,*

956 F.2d 1508, 1522 (9th Cir. 1992). Nor may an agency evade its duty to consider a reasonable range of alternatives by defining its project objectives in unnecessarily narrow terms, in order to artificially restrict the range of alternatives considered. *City of Carmel By-The-Sea v. U.S. Department of Transportation*, 123 F.3d 1142, 1155 (9th Cir. 1997). "The federal courts cannot condone an agency's 'contriv[ing] a purpose so slender as to define competing 'reasonable alternatives' out of consideration.'" *Simmons v. U.S. Army Corps. of Engineers*, 120 F.3d 664, 666 67 (7th Cir. 1997); *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 196 (D.C. Cir. 1991).

DOI's NEPA handbook explains that the "purpose and need statement for an externally generated action must describe the BLM purpose and need, *not an applicant's or external proponent's purpose and need*." Department of Interior, Bureau of Land Management, National Environmental Policy Act Handbook 35,(citing 40 C.F.R. § 1502.13) (emphasis added), *available at:* http://www.blm.gov/pgdata/etc/medialib/blm/wo/Information_Resources_Management/policy/blm_handbook.Par.24487.File.dat/h1790-1-2008-1.pdf
(citing 40 C.F.R. § 1502.13) . "The applicant's purpose and need may provide useful background information, but this description must not be confused with the BLM purpose and need for action . . . . It is the BLM purpose and need for action that will dictate the range of alternatives.

The BLM's definition of the project's purpose will necessarily affect the range of alternatives considered, because when "the purpose is to accomplish one thing, it makes no sense to consider the alternative ways by which another thing might be achieved."

BLM **MUST** offer and analyze a distributed generation alternative, as well as siting on degraded or contaminated lands, and other alternatives listed in CCV's Draft PEIS comments April 13, 2011, in order to be in compliance with NEPA.

WATER

Mr. Michael Wright from the USGS conducted a study in the Chuckwalla Valley, Groundwater Ambient Monitoring Analyzing ("GAMA"), which provided age dating for the area. In a personal conversation with Mr. Wright, we learned that they examined wells in Desert Center and determined the water is "very, very old", thousands of years old. He explained that when tritium is not detected there has been no recharge for the past 50 years, which is a commonly accepted hydrological fact. No tritium was observed in the Chuckwalla Valley well(s) studied. Why didn't the SPEIS do tritium analysis? Also, C14 will tell exactly how old the water is, but the SPEIS did no such analysis.

Despite the voodoo science in your book, these projects will use copious amounts of precious desert groundwater, leaving behind solar ghost towns when the projects run their course, or when the money runs out, whichever occurs first.

AIR QUALITY

DPS anticipates that excessive pumping from all of the projects will lower the water table to the point that plants' roots will no longer be able to access water. First small plants will not be able to survive, then as the table lowers, ironwoods, smoketrees, palo verde, and creosote will eventually die leaving a denuded desert and a PM10 and Ultra fine Particulate problem. This adds to eutrophication of the desert described below. Residents are also concerned about exposing arsenic that naturally occurs in desert soils, by denuding the desert. There is a human health consequence from denuding the desert. Arsenic occurs naturally in desert soils, but pose no risk *unless it is disturbed*. The solar swaths will expose residents and wildlife to cancer causing arsenic when it becomes airborne. Cumulatively with the other proposed and under construction projects, a significant negative impact will be created.

What will be the impacts to the Palm Springs Roundtail Ground Squirrel who like to live in the sand dune/mesquite areas where the water tables are higher? They will be the first to die from the obvious drawdown of water from the proposed and present activities in the Upper Chuckwalla Valley.

Researchers are finding that the desert is sucking up carbon at rates they never imagined:

> "…Researchers have found that Nevada's Mojave Desert, square meter for square meter, absorbs about the same amount of CO2 as some temperate forests. The two sets of findings suggest that deserts are unsung players in the global carbon cycle. "Deserts are a larger sink for carbon dioxide than had previously been assumed," says Lynn Fenstermaker, a remote sensing ecologist at the Desert Research Institute (DRI) in Las Vegas, Nevada, and a coauthor of a paper on the Mojave findings published online last April in Global Change Biology.
>
> The effect could be huge: About 35% of Earth's land surface, or 5.2 billion hectares, is desert and semiarid ecosystems. If the Mojave readings represent an average CO2 uptake, then deserts and semiarid regions may be absorbing up to 5.2 billion tons of carbon a year--roughly half the amount emitted globally by burning fossil fuels, says John "Jay" Arnone, an ecologist in DRI's Reno lab and a co-author of the Mojave paper…". (Science 13 June 2008: Vol. 320. no. 5882, pp. 1409 – 1410 DOI: 10.1126/science.320.5882.1409).

Compound that with hundreds of thousands of acres to be cleared for "green energy" people nor animals will be able to survive, and we can kiss the resources of Joshua Tree National Park good-bye. There is no evidence that destroying intact old growth desert systems with massive solar projects will cause a net benefit to offset global warming.

There are a couple solar projects under construction in the Chuckwalla Valley currently.

Despite mitigations to control dust, dust continues to be a chronic problem. Keeping in mind this area previously had no dust problems before, but now has a constant haze. Keep in mind, dust images below are just from one project – image hundreds of thousand of acres of this assault.

The Chuckwalla and Coxcomb Mountains (latter Joshua Tree National Park Wilderness) choked out by dust. This is not only a health issue for residents, plants, and animals, it is a visual resource issue. The US Government has absolutely zero respect for Joshua Tree National Park and rural residents, as proven by your unyielding desire to industrialize the desert.

In case we haven't made ourselves clear yet, we **vehemently oppose industrialization of the desert with so called green energy projects.**

Cultural Resources

The resulting material recovered during archaeological testing and recovery phases is a sensitive subject among Native Americans. Their concerns regarding all aspects of archaeological "mitigation" should be sought and seriously considered. Curation of recovered materials is one of these concerns. It has been said that "these materials should not live away from the people and place to which they are connected." People of the Chemehuevi, Serrano, Mojave, and Cahuilla nations should be consulted as to how and where they wish recovered materials to be maintained.

Desert Tortoise and Climate Change

In the 2009 Final Report "Niche modeling and implications of climate change on desert tortoises and other selected reptiles within Joshua Tree National Park (JTNP) " Cameron Barrows models the current suitable habitat and projects the extent of suitable habitat under a mean climate shift of +2^{o}C and -75mm of annual rainfall for desert tortoise. The data shows that habitat will become available on the slopes of Eagle Mountain and that the current healthy population of desert tortoise in Chuckwalla Valley is the reservoir for future immigration into JTNP from the southeast. (This report is available from Cameron Barrows, Center for Conservation Biology, University of Riverside and from Joshua Tree National Park.)

Fragmenting the tortoise habitat will be the ruination of the species in an area where they are healthy - have no respiratory or other diseases. You will be in effect murdering our great States' Reptile.

Wildlife Conservation and Solar Energy Development in the Desert Southwest, United States

Jeffrey E. Lovich a research ecologist, and Joshua R. Ennen a wildlife biologist, both with the US Geological Survey, Southwest Biological Science Center penned the above captioned article (982 BioScience • December 2011 / Vol. 61 No. 12). They concluded:

> "All energy production has associated social and environmental costs (Budnitz and Holdren 1976, Bezdek 1993). In their review of the adverse environmental effects of renewable energy development, Abbasi and Abbasi (2000) stated that "renewable energy sources are not the panacea they are popularly perceived to be; indeed, in some cases, their adverse environmental impacts can be as strongly negative as the impacts of conventional energy sources" (p. 121). Therefore, responsible, efficient energy production requires both the minimization of environmental costs and the maximization of benefits to society—factors that are not mutually exclusive. Stevens and colleagues (1991) and Martín-López and colleagues (2008) suggested that the analyses of costs and benefits should include both wildlife use and existence values. On the basis of our review of the existing peer-reviewed scientific literature, it appears that insufficient evidence is available to determine whether solar energy development, as it is envisioned for the desert Southwest, is compatible with wildlife conservation. This is especially true for threatened species such as Agassiz's desert tortoise. The many other unanswered questions that remain after reviewing the available evidence provide opportunities for future research, as was outlined above. The shift toward renewable energy is widely perceived by the public as a "green movement" intended to reduce greenhouse gas emissions and acid rain and to curb global climate change (Abbasi

> and Abbasi 2000). However, as was noted by Harte and Jassby (1978), just because an energy technology is simple, thermodynamically optimal, renewable, or inexpensive does not mean that it will be benign from an ecological perspective. The issue of wildlife impacts is much more complex than is widely appreciated, especially when the various scales of impact (e.g., local, regional, global) are considered. Our analysis shows that, on a local scale, so little is known about the effects USSEDO on wildlife that extrapolation to larger scales with any degree of confidence is currently limited by an inadequate amount of scientific data. Therefore, without additional research to fill the significant information void, accurate assessment of the potential impacts of solar energy development on wildlife is largely theoretical but needs to be empirical and well-founded on supporting science."

The government needs to implement the Precautionary Principal with regards to massive energy projects. Clearly these are all experimental and on a scale never before witnessed. The Precautionary Principal is simple – if there is a chance of negative consequences simply do not do it. The article referenced above clearly shows that much, much more science needs to be conducted to understand and properly mitigate massive energy projects. We incorporate "Wildlife Conservation and Solar Energy Development in the Desert Southwest, United States" as though fully contained herein.

Joshua Tree National Park

Joshua Tree National Park is considered one of the finest examples of Mojave Desert and Colorado Desert in existence today. Since President Roosevelt established Joshua Tree National Monument in 1936, national park status has precluded off-road driving, livestock grazing, hunting, mining, and most other anthropogenic disturbances. Additional distinction was added by declaration of Wilderness status for nearly 80% of the park and designation as an International Biosphere Reserve. The American people and the Congress of the United States have felt these acres worthy of preservation for the enjoyment of future generations. Dr. E. Jaeger (1965) wrote, "[California deserts] are among the most appealing of our scenic wonderlands... places which, left undisturbed, minister greatly to the pleasure and ennoblement of man's mind."

The Joshua Tree desert is characterized by geographic, botanical, and wildlife diversity. With rainfall amounts ranging from 4-12 inches annually and summer heat often reaching over 100 degrees Fahrenheit both wildlife and vegetation must adapt to harsh conditions and short periods of suitable conditions for feeding, growth and reproduction. This is a fragile land with little soil development, few nutrients and sparse water. It is this combination of traits which was set aside as a national park and it is this set of circumstances we are all charged to protect.

For a number of years, National Park Service at Joshua Tree National Park has maintained and operated an air quality monitoring system within close proximity to Eagle Mountain (Upper Chuckwalla valley). Data collection began in May 2006 with a collection interval of 180 days (October). The 180 day cycle continued 2007, 2008 and is now collecting data for a fourth 2009 session. The impetus for the data collection beginning in 2006 was to collect baseline ozone data in anticipation of operations for both the Eagle Mountain hydroelectric project and the proposed Eagle Mountain dump. The data collection point is located on Park property, 6 miles northeast of the proposed dump and hydro projects, as well as proposed solar projects. In Summary the "Final Validated" data collected in 2006 and 2007 at 85ppb standard indicated respectively only two days of violation of the eight hour standard. The 2008 and 2009 (work in progress) are at the new NAAQS of 75 ppb and are presented here. If the older standard of 85 ppb were applied, one day in 2008 and zero days in 2009 would show a violation of the eight hour standard. All data indicate that during the summer months when ozone levels are at their highest, the

eastern portion of the Park is substantially less impacted by high levels of ozone than the entire western portion of the Park. Maintaining this high level of air quality is paramount to NPS, environmentalists, desert residents, and the Clean Air Act. This information is from comments to the Federal Energy Regulatory Commission regarding the proposed hydroelectric project at Eagle Mountain, dated August 17, 2009.

Joshua Tree National Parks' exquisite night skies will be polluted with light and dust from industrial sized solar projects. Astronomers visit this area of the Park from around the World to study the skies without light/particle pollution.

The Managers at Joshua Tree National Park have freely taken an Oath to protect the Park, and they do so in a profound, stellar fashion. The DOI created the National Park Service, and we hope, as well as expect the Managers of the Park to continue that fierce protection of their resources.

The people expect our Parks to remain pristine. To illustrate that point, recently **106,622** people sent letters to Secretary Salazar to encourage him to oppose the corporation who wanted to build the world's largest garbage dump in the arms of Joshua Tree, in the U. S. Supreme Court. The government opposed the corporation's petition. That's a lot of support for our desert jewel !

We have never seen such a wholesale assault on public lands in our life. The Riverside East SEZ will surely destroy livelihoods of residents, abuse a National Park that seems to be the unwanted stepchild of the DOI, and amounts to nothing more than corporate welfare on steroids. At least, you should insist that these highly industrial projects be 25 miles away from the Park's boundary. At best, the DOI ought to insist on distributed generation and preserve all of our Public Lands from the Great Terrain Robbery.

RECLAMATION

Even though there would be decommissioning plans with each project, the subject public lands will not be reclaimed, as the case with the mining industry regulations.

Projects are obtaining aggregate from their R-O-W, by depositing large loads of soil on screens and recovering the aggregate. This is in effect mining on public lands and reclamation regulations for "green energy" projects on public lands must be promulgated to return those lands back to their conditions prior to development. To do less is to incur an irretrievable loss of those lands for eternity.

Further, with every wilderness bill for conservation comes complaints of closing off our public lands. Of course those lands are not "closed off" because people may still hike, camp, relax, photograph, etc on those lands. Not so with the industrialization of our deserts for energy projects. We have walked, picnicked, photographed, enjoyed the public lands that are now fenced with razor wire tops preventing anyone from enjoying those lands ever again.

Here we have previously protected lands that were being conserved for future generations' enjoyment, only to have them ripped from the public for mass industrialization. If a reclamation plan was instituted for these projects, there would be hope that one day everyone can enjoy them once again.

CONCLUSION

In closing, Donna Charpied, the undersigned was presented with the Golden Presidential Volunteer Service Award. The Letter from President Obama states in part, "…Our Nation faces the most challenging economic crisis in a lifetime. We will only renew America if we all work together.

Individuals, the private sector, and government must combine efforts to make real and lasting change so that each person has the opportunity to fulfill his or her potential…".

The government's misguided energy policy is fulfilling the needs of corporate America while rural communities and our vulnerable Parks are being squashed like bugs.

Respectfully Submitted,

Donna Charpied

Donna Charpied, Executive Director DPS
Desert Protection Society (Formerly Citizens for the Chuckwalla Valley)
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(760) 392-4722
(c) 760-987-1363
laronna@earthlink.net
http://www.youtube.com/watch?v=pOwFa1tnpNc
"DON'T WASTE OUR DESERT"

CC: Interested Parties.

Thank you for your comment

The comment tracking number that has been assigned to your comment is SEDDsupp20078.

Comment Date: January 26, 2012 17:01:30PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20078

First Name: [Withheld by requestor]
Middle Initial:
Last Name: [Withheld by requestor]
Organization:
Address:
Address 2:
Address 3:
City:
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold name and address from public record
Attachment:

Comment Submitted:

Just found out about this plan and would like to request an extension of time to submit comments and respond to The Solar PEIS Supplement. Thank You.

Thank you for your comment, Mary Jo Borak.

The comment tracking number that has been assigned to your comment is SEDDsupp20079.

Comment Date: January 26, 2012 17:08:39PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20079

First Name: Mary Jo
Middle Initial:
Last Name: Borak
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Address 3:
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Privacy Preference: Don't withhold name or address from public record
Attachment: SolarPeissupplementCPUCcomments1272012.pdf

Comment Submitted:

STATE OF CALIFORNIA EDMUND G. BROWN JR., *Governor*

PUBLIC UTILITIES COMMISSION
505 VAN NESS AVENUE
SAN FRANCISCO, CA 94102-3298

January 27, 2012

Ms. Heidi M. Hartmann
Solar Energy Draft PEIS
Argonne National Laboratory EVS/900
9700 S. Cass Ave. EVS/900
Argonne, IL. 60439

Re: California Public Utilities Commission (CPUC) Comments on the Supplement to the Draft Programmatic Environmental Impact Statement (DPEIS) for Solar Energy Development in Six Western States prepared by the Bureau of Land Management (BLM) and the Department of Energy (DOE)

Dear Ms. Hartmann:

Thank you for the opportunity to comment on the BLM and DOE Supplement to the Draft PEIS for the solar energy development in the six western states including the consideration of Solar Energy Zones (SEZs). Through the PEIS process, BLM is evaluating a new Solar Energy Program for utility-scale solar development on BLM-administered lands in the six western states. DOE is evaluating new program guidance relevant to DOE supported solar projects on federal, state, tribal, or private land.

We have provided previous comments on the Draft PEIS and scoping comments on both the May 2008 and July 2009 notices and have been a cooperating agency on the Solar PEIS as well as a representative on the California Interagency Working Group for the Solar PEIS. In addition, the CPUC was an active member of the Renewable Energy Transmission Initiative (RETI) process for over 3 years and now recently involved in the ongoing DRECP process. As evidenced by our continued involvement, the CPUC is very supportive of the Solar PEIS process. On April 12, 2011, Governor Jerry Brown signed into law Senate Bill 2 (First Extraordinary Session), extending the current 20 percent renewable energy goal by 2010 to a 33 percent goal by December 31, 2020.

In an attachment to this letter, we would like to provide BLM with some additional new comments on the Supplement document. However, we are pleased to see that BLM has

addressed a number of our Draft PEIS comments in this Supplement as well as outlining clear guidance on identifying new SEZs and providing incentives for projects within the SEZs. Per our draft comments, we support the Riverside East and imperial East SEZs being carried forward in California and the elimination of Iron Mountain due to major resource conflicts. Although we also recommended the Pisgah SEZ be carried forward, it was dropped as a SEZ. However, we appreciate the fact that BLM will still consider the former SEZ as a solar right-of-way (ROW) variance area. In addition, the CPUC expressed concerns regarding the BLM Preferred Alternative that allows solar development outside the SEZs. However, BLM has now provided a list of requirements and considerations for allowing solar in variance areas including priority consideration to areas identified through the DRECP process and that will minimize the need to build new transmission.

BLM should to be commended for their efforts in meeting the challenges of solar development and their high level of responsiveness to addressing agency and public comments. We look forward to continuing to work with BLM on the finalization of the Solar PEIS document in our role as a cooperating agency and as a member of the Interagency Working Group. If you have any questions, please contact Billie Blanchard, our interagency group representative, at 415-703-2068 or email at bcb@cpuc.ca.gov.

Sincerely,

Mary Jo Borak
Supervisor
Energy Division
Infrastructure Permitting & CEQA

Cc: Molly Sterkel, Program Manager Energy Division
Paul Douglas, CPUC Energy Division
Ashley Conrad-Saydah, BLM State Office
Roger Johnson, CA. Energy Commission
Michael Picker, Governor's Office

CPUC COMMENTS ON SUPPLEMENT TO THE DRAFT SOLAR PEIS
JANUARY 27, 2012

Solar PEIS process and its relationship to the California DRECP process with overlapping boundaries and BLM involvement

CPUC would like BLM to clarify a number of Supplement statements in the Final PEIS that relate to and may carry over to the California DRECP process as outlined below:

- **Section 1.3 page 1-4 BLM Purpose and Need**

Comment - Given the DRECP process as discussed on pages 2-31 and 32 is now ongoing in the same California Solar PEIS area, to what extent will BLM's purpose and need statements, if any, be considered applicable to the DRECP purpose and need?

- **Section 1.4 page 1-5 BLM Decisions to be Made as part of Solar PEIS** process includes Item 1 Land use amendments that identify exclusion areas for utility scale solar energy development in the six state study areas.

Comment – With the ongoing and overlapping DRECP process, will the exclusion areas from solar development listed on Table 2.2-1 be considered the same solar and/or renewable development exclusion areas for the purposes of the DRECP land use amendment process?

- **Section 1.4 page 1-5 BLM Decisions to be Made** includes Item 2 which indicates land use amendments that identify areas potentially available for utility scale solar energy development outside of SEZs in the six state study areas in variance areas.

Comment – With the identification of potential solar development variance areas in addition to California carried forward SEZs, will this commit the related DRECP process to the proposed DRECP development scenario alternative known as the Development Focus Areas (DFAs) Emphasis? It has been stated to the DRECP stakeholder members as a "scenario where renewable energy development would occur primarily within the DFAs with incentives to retain development within the DFAs subject to stricter siting and design criteria than would occur within the DFAs." (Dudek/ICF Draft Memo, 12/9/2011)

- **Section 1.6 page 1-7 and 1-8 Reasonably Foreseeable Development Scenario (RFDs)** – In the 1st and 2nd paragraph it states, "RFDs developed for the Draft Solar PEIS to help define the potential magnitude of solar energy development that could occur within the six state study areas over the next 20 years is still considered to be valid to support analysis in this Supplement and the Final Solar PEIS.....To establish an upper bound it was assumed that 50% of the RPS – based requirement for renewable energy

production would be provided from solar energy and that 75% of the solar development would occur on BLM administered lands within the specific state." Table 1.6-1 provides BLM California estimated MWs and acres of land to support the above described level of development.

Comment – Again given the DRECP overlapping process, to what extent will BLM through the Solar PEIS process commit the DRECP area to a certain level of reasonable development area?

- **Section 2.2.2.2.3 Incentives for Projects in SEZs page 2-24 – 25 Improve and Facilitate Mitigation** – In the third paragraph it is stated, "To the extent that public lands are used to mitigate for the impacts of solar development whether in or out of the SEZs, the BLM will develop strategies to ensure that any mitigation lands are protected to provide enduring conservation benefits."

Comment – It is the CPUC's understanding that a stakeholder comment or question has arisen in the DRECP process regarding the ability of BLM to commit lands for conservation purposes in perpetuity. It would be helpful and informative to the DRECP process if BLM could elaborate in the Final PEIS on what strategies will be utilized on public lands used for mitigation lands that provide for enduring conservation benefits.

- **Section 2.2.1.1 Right-of- Way Authorization Policies** – This section includes changes in BLM proposed ROW authorization policies reflecting comments received in the Draft Solar PEIS including Terms of ROW, Renewal of ROW, and Upgrades or Changes to Facility Design or Operation.

Comment – Given that there may be various future technological changes in solar energy developments, it would be helpful for BLM to clarify in this section the process for repowering a development on the same right-of- way grant area. It is not clear in the specific underlined stated items above.

Thank you for your comment, Pamela Nieberg.

The comment tracking number that has been assigned to your comment is SEDDsupp20080.

Comment Date: January 26, 2012 17:21:31PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20080

First Name: Pamela
Middle Initial: S
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Attachment:

Comment Submitted:

I understand the BLM is considering changes to large-scale solar development on public lands which represent improvements to the program that will reduce impacts on fragile desert ecosystems.

I strongly support the preferred solar zone alternative to focus solar development in lower-conflict zones instead of opening up 22 million acres of Western lands to solar development. I support the designation of exclusion areas and transferring focus to low resource value locations. Variances under this program should be limited and effort taken to ensure that our most important habitat and ecosystems are protected from solar development.

Pam Nieberg

Thank you for your comment, David Peach.

The comment tracking number that has been assigned to your comment is SEDDsupp20081.

Comment Date: January 26, 2012 17:27:45PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20081

First Name: David
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Last Name: Peach
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State: CA
Zip: 92252
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

Please allow an extension of the public comment deadline to provide suitable opportunity to study the Solar PEIS Supplement.

Thank you for your comment, Cynthia (Cindy) Buxton.

The comment tracking number that has been assigned to your comment is SEDDsupp20082.

Comment Date: January 26, 2012 17:37:31PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20082

First Name: Cynthia (Cindy)
Middle Initial: M
Last Name: Buxton
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Address 2:
Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold address from public record
Attachment: New Microsoft Word Document (2).doc

Comment Submitted:

I participated in a five month collaborative settlement to the 15 year Land Management Plan (LMP) Settlement agreement concerning the Southern California 15 year plan for the Forest Service. Not intending to single any group or anyone, I genuinely like these people and when I don't I can honestly say at least I want to like them. I really wish we could remove these impediments to better communication and conflict. The participants were in the tenuous positions of having to pick up an issue with history and baggage. It is not to personalize in this forum because it was not an ideal starting point. Nevertheless, the comments below include the concerns and takeaways I observed through this process relevant to future siting.

The degree to which GIS managed layered mappings is the primary data source for sweeping and permanent decisions affecting public lands is shocking. To clarify, GIS is a great tool for a rough review. I'm sure it has revolutionized land management and policy process.

However, in my opinion it is being abused and exploited to the demise of gorgeous public lands and critical habitats.

Accuracy and integrity have fallen from the primary intention while the foot to the ground skills of agency rangers have suffered at the hands of allowing too much reliance on this tool.

I know the areas we were reviewing foot to ground over many years before and after fires and in all seasons, and I have photos of them. Some are the most unspoiled and beautiful natural surprises I've encountered anywhere. If you ask the agency personnel however the answer is not always congruent with my experience. From some it is watered down, disjoint, vague, and detached.

Do I just have an odd sense of values? Human nature doesn't change, especially among the young and ambitious. Most parents would not be fooled. They are ambivalent because they have not been there. They do not want to admit at times that they do not know how to get there. People, all of us, react and adjust to their own ignorance in many ways.

It is incumbent upon the agencies, such as the BLM and the National Forest Service not to let good human resources get to this point. They need to insure that the training opportunities, the mentoring, and apprenticeships complete in such a way as to make the ranger "whole" at the end of it. Your new young neophytes and not so new if it goes on long enough are placed into a precarious position without these, as is the fate our or lands, -and our society.

I am concerned that many designations are placed arbitrarily and capriciously upon public maps as a result. It may not excuse their own lack of maturity, albeit truthfulness, but strong management has to do a better job of directing their maturity within that land to person interface. Poor accuracy without some thoughtful support through mentorship will result in apathy and even distain at the hands of frustration and peer pressure. How do you ensure peer pressure can not override the truth? How do you ensure it supports it?

The true veteran leaders of the land need to be allowed to lead. How do you ensure that truth is known when it is spotted? There is no University on Earth a better teacher in this regard than the great outdoors. We just have to ensure we continue to go there; we do, and we ensure our own credibility and the integrity of sustainability, if not survival.

If management doesn't know- and doesn't go, either, and too often they don't, too often they are too tired to muster the steam to

care. If our law makers, as I suspect carry even more of the bulk of the root cause, fail in keeping the financial resources in land management agencies, then the young upstarts as well as the older ones can not get the momentum up high enough for being way over tasked from wearing too many hats and spread too thin.

The enormous impact that this has had on this country is astounding in only a few years. Our reality is what is real to us. That that could be more the multilayered satellite image on our monitors; than the ach in our feet, the burning chill of sunburn and scratches after a day of cross country exploring, the virtual sound of a gurgling stream still heard into the night long back at home; is unbelievable if I had not experienced it first hand: “Ground truthing isn’t really ground truthing, its checking the map…we don’t have a way to quantify scenic integrity” --Sure you do, but you have to know it when you see it. Scenic Integrity is not a criterion of imagery. It is a criterion of NEPA.

There is an element of the wild land profession, in my opinion, that is sacred. It must be so or we have lost; we are lost on the undestined voyage without purpose or principle.

That connection that some have the privilege to keep for a society is as critical as the habitat within.

It should go beyond the traverse lines of a topo map and satellite image to an inarticutateable awareness of the spirit within. When I fail to see that spirit in the condescending and ego-laden alliances born of job stress, fear, peer pressure, self consciousness, and ignorance, my faith in this process wanes. When I do see it and hear it coming from under the words of a few wonderful rangers that know the ground and the spirit that connects to it, then I can be far more faithful to the new collaborative movement.

I’ve seen collaborative through GIS from wonderful, respected, knowledgeable people. One woman’s opinion: It was a disaster. The best part was just in being there , remnants of spirit to sustain the faith in the intention. --Ok maybe it was just closer to a political rally that a mindful playing to the strengths as I had anxiously anticipated. Didn’t happen, but my assertiveness skills if not improved were at least exercised like never before.

What I saw could be criminal if not unwittingly so. It could be a violation of the
Federal "making false claims to the Federal Government' laws, and when there are projects that are hinging on these land management classes it would potentially be a violation of the Federal Procurement Act and even open up concerns of violations of Federal Anti Trust Laws, Conspiracy, Racketeering, Insider Trading (on steroids). Harsh words. Very Harsh.

So harsh when coming from this gender, the other one so largely in the majority “out there”, recoils and runs. Nothing is done. The alliance system is protected. We need to start throwing our staffed land managers into the thick of it. Literally until the stars consume them and the sounds of the woods re-hypnotized them to the portion of our existence that is actually the un-animated, the un-contrived, -the real one, less we are lost and enslaved by the illusionary matrix of social propriety, self consciousness, fear, and domination by apathy and “reality” TV, for good.

When scenic integrity of whole land plans are high on top but moderate next to a roaring wild stream in a dense riparian environment of huge legacy trees, I get suspicious. There they are in the public record. These are precious and rare in an arid ecology. –and they sequester far more CO2 than the wind mills or solar farms that would seek to replace them . See a multitude of controlled studies coming about in credible journals such as Science. Please don’t disturb these places for any reason, nor the places anywhere in sight of them and then some. Please engrave this order from the land and our heritage in stone. Please go see them, not by satellite, not by helicopter, but by foot-to the –ground resource.

This CAN be avoided and these projects CAN be done affectively and with reverence to our wild places. The most obvious alternatives in my opinion, to the process so far, should include:

1) Reduce the population. We must, by half. Energize the population control movement in full kilt. Don’t ruin what’s left for a volume that HAS to go down. We must attenuate nicely before nature does it for us.
2) Put local roof top solar in first place energy selection. The evolving sophistication of the public can not support massive land grabs and the rationalizing that goes with them, when the most obvious and least impacting methods are not only ignored but avoided.
3) Protect ANY complex system. These remove CO2. All the energy farms in the world do not remove a single molecule.
4) Replant, reforest, and restore old systems that have been cut or burned.

Thank you for reading.
Sincerely ,
Cynthia (Cindy) Buxton
Chair of the Forest SubCommittee of the San Diego Sierra Club

I participated in a five month collaborative settlement to the 15 year Land Management Plan (LMP) Settlement agreement concerning the Southern California 15 year plan for the Forest Service. Not intending to single any group or anyone, I genuinely like these people and when I don't I can honestly say at least I *want* to like them. I really wish we could remove these impediments to better communication and conflict. The participants were in the tenuous positions of having to pick up an issue with history and baggage. It is not to personalize in this forum because it was not an ideal starting point. Nevertheless, the comments below include the concerns and takeaways I observed through this process relevant to future siting.

The degree to which GIS managed layered mappings is the primary data source for sweeping and permanent decisions affecting public lands is shocking. To clarify, GIS is a great tool for a *rough* review. I'm sure it has revolutionized land management and policy process.

However, in my opinion it is being abused and exploited to the demise of gorgeous public lands and critical habitats.

Accuracy and integrity have fallen from the primary intention while the foot to the ground skills of agency rangers have suffered at the hands of allowing too much reliance on this tool.

I know the areas we were reviewing foot to ground over many years before and after fires and in all seasons, and I have photos of them. Some are the most unspoiled and beautiful natural surprises I've encountered anywhere. If you ask the agency personnel however the answer is not always congruent with my experience. From some it is watered down, disjoint, vague, and detached.

Do I just have an odd sense of values? Human nature doesn't change, especially among the young and ambitious. Most parents would not be fooled. They are ambivalent because they have not been there. They do not want to admit at times that they do not know *how* to get there. People, all of us, react and adjust to their own ignorance in many ways.

It is incumbent upon the agencies, such as the BLM and the National Forest Service not to let good human resources get to this point. They need to insure that the training opportunities, the mentoring, and apprenticeships complete in such a way as to make the ranger "whole" at the end of it. Your new young neophytes and not so new if it goes on long enough are placed into a precarious position without these, as is the fate our or lands, -and our society.

I am concerned that many designations are placed arbitrarily and capriciously upon public maps as a result. It may not excuse their own lack of maturity, albeit truthfulness, but strong management has to do a better job of directing their maturity within that land to person interface. Poor accuracy without some thoughtful support through mentorship

will result in apathy and even distain at the hands of frustration and peer pressure. How do you ensure peer pressure can not override the truth? How do you ensure it supports it?

The true veteran leaders of the land need to be allowed to lead. How do you ensure that truth is known when it is spotted? There is no University on Earth a better teacher in this regard than the great outdoors. We just have to ensure we continue to go there; we do, and we ensure our own credibility and the integrity of sustainability, if not survival.

If management doesn't know- and doesn't go, either, and too often they don't, too often they are too tired to muster the steam to care. If our law makers, as I suspect carry even more of the bulk of the root cause, fail in keeping the financial resources in land management agencies, then the young upstarts as well as the older ones can not get the momentum up high enough for being way over tasked from wearing too many hats and spread too thin.

The enormous impact that this has had on this country is astounding in only a few years. Our reality is what is real to us. That that could be more the multilayered satellite image on our monitors; than the ach in our feet, the burning chill of sunburn and scratches after a day of cross country exploring, the virtual sound of a gurgling stream still heard into the night long back at home; is unbelievable if I had not experienced it first hand: "Ground truthing isn't really ground truthing, its checking the map…we don't have a way to quantify scenic integrity" --Sure you do, but you have to know it when you see it. Scenic Integrity is not a criterion of imagery. It *is* a criterion of NEPA.

There is an element of the wild land profession, in my opinion, that is sacred. It must be so or we have lost; we *are* lost on the undestined voyage without purpose or principle.

That connection that some have the privilege to keep for a society is as critical as the habitat within.

It should go beyond the traverse lines of a topo map and satellite image to an inarticutateable awareness of the spirit within. When I fail to see that spirit in the condescending and ego-laden alliances born of job stress, fear, peer pressure, self consciousness, and ignorance, my faith in this process wanes. When I do see it and hear it coming from under the words of a few wonderful rangers that know the ground and the spirit that connects to it, then I can be far more faithful to the new collaborative movement.

I've seen collaborative through GIS from wonderful, respected, knowledgeable people. One woman's opinion: It was a disaster. The best part was just in being there , remnants of spirit to sustain the faith in the intention. --Ok maybe it was just closer to a political rally that a mindful playing to the strengths as I had anxiously anticipated. Didn't happen, but my assertiveness skills if not improved were at least exercised like never before.

What I saw could be criminal if not unwittingly so. It could be a violation of the

Federal "making false claims to the Federal Government' laws, and when there are projects that are hinging on these land management classes it would potentially be a violation of the Federal Procurement Act and even open up concerns of violations of Federal Anti Trust Laws, Conspiracy, Racketeering, Insider Trading (on steroids). Harsh words. Very Harsh.

So harsh when coming from this gender, the other one so largely in the majority "out there", recoils and runs. Nothing is done. The alliance system is protected. We need to start throwing our staffed land managers into the thick of it. Literally until the stars consume them and the sounds of the woods re-hypnotized them to the portion of our existence that is actually the un-animated, the un-contrived, -the real one, less we are lost and enslaved by the illusionary matrix of social propriety, self consciousness, fear, and domination by apathy and "reality" TV, for good.

When scenic integrity of whole land plans are high on top but moderate next to a roaring wild stream in a dense riparian environment of huge legacy trees, I get suspicious. There they are in the public record. These are precious and rare in an arid ecology. –and they sequester far more CO2 than the wind mills or solar farms that would seek to replace them . See a multitude of controlled studies coming about in credible journals such as **Science**. Please don't disturb these places for any reason, nor the places anywhere in sight of them and then some. Please engrave this order from the land and our heritage in stone. Please go see them, not by satellite, not by helicopter, but by foot-to the –ground resource.

This CAN be avoided and these projects CAN be done affectively and with reverence to our wild places. The most obvious alternatives in my opinion, to the process so far, should include:

1) Reduce the population. We must, by half. Energize the population control movement in full kilt. Don't ruin what's left for a volume that HAS to go down. We *must* attenuate nicely before nature does it for us.
2) Put local roof top solar in first place energy selection. The evolving sophistication of the public can not support massive land grabs and the rationalizing that goes with them, when the most obvious and least impacting methods are not only ignored but avoided.
3) Protect ANY complex system. These remove CO2. All the energy farms in the world do not remove a single molecule.
4) Replant, reforest, and restore old systems that have been cut or burned.

Thank you for reading.
Sincerely ,
Cynthia (Cindy) Buxton
Chair of the Forest SubCommittee of the San Diego Sierra Club

Thank you for your comment, PHYLLIS LYTE.

The comment tracking number that has been assigned to your comment is SEDDsupp20083.

Comment Date: January 26, 2012 17:43:24PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20083

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Attachment:

Comment Submitted:

Due to the long-term consequences of proceeding with this project, and the number of local citizens who have not read or heard about it so that they can be well-informed, I am adding my voice to that of others, REQUESTING THAT THE COMMENT PERIOD BE EXTENDED.

Please allow our local communities to become informed before proceeding!!

Thank you for your comment, Sam Sloneker.

The comment tracking number that has been assigned to your comment is SEDDsupp20084.

Comment Date: January 26, 2012 17:56:33PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20084

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Attachment:

Comment Submitted:

The Solar PEIS Supplement, with its extensive scientific data and regulatory information requires time for stakeholders to make informed comments.

An extension of the public comment period (3 months) is necessary to have sufficient time to adequately analyze the effects of 20 million additional acres of public lands and to ensure a meaningful democratic process. I respectfully request that such an extension be granted.

The size of these variance lands east of the City of Twentynine Palms and east of the Air/Ground Combat Center will affect wildlife corridors and other environmental, cultural, and economic resources. Solar development on these lands and their proximity to the Joshua Tree National Park which attracts visitors from all over the world will have a significant effect on the local and regional tourism economy of the gate-way communities in the Morongo Basin.

It is important that these impacts be brought to full attention and that sufficient time for such input and consideration is allowed.

Sncerely,

~Sam Sloneker

Thank you for your comment, Jared Fuller.

The comment tracking number that has been assigned to your comment is SEDDsupp20085.

Comment Date: January 26, 2012 18:14:03PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20085

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Privacy Preference: Withhold address from public record
Attachment:

Comment Submitted:

Desert tortoise habitat and 'connectivity zones' in all populations, but especially in the northeast and western populations in Nevada and California, should be excluded from solar development. In general, habitat for these two populations is more threatened than other areas under BLM administration. These threats include susceptibility to fire near the habitat limit and at higher elevations, potential urban development (proximity to major metropolitan areas), military activities as well as wind energy development and solar development on non-BLM lands. These come in addition to possible changes and shifts in habitat resulting from climate change. Present applications in desert tortoise habitat, especially in connectivity zones, which may otherwise be open to proceed under the 'variance process', should also be added to the exclusion area such as the applications in the Ivanpah Valley. Excluded tortoise habitat would also reduce threats to numerous other animals and plants within the Mojave desert ecosystem.

Thank you for your comment, Nino Mascolo.

The comment tracking number that has been assigned to your comment is SEDDsupp20086.

Comment Date: January 26, 2012 18:36:33PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20086

First Name: Nino
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Attachment: Solar PEIS supplmental comment letter Southern California Edison_Jan26.pdf

Comment Submitted:

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

January 26, 2012

Solar Energy PEIS
Argonne National Laboratory
9700 S. Cass Avenue
EVS/240
Argonne, IL 60439
Submitted via U.S. Mail and Email

Attention: Attention: Shannon Stewart (BLM) and Jane Summerson (DOE)

Subject: Southern California Edison Company comments on the Supplement to the Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (Solar PEIS)

To the Solar PEIS Team:

Southern California Edison (SCE) is pleased to provide comments on the Supplement to the Draft Solar PEIS, released by the Bureau of Land Management (BLM) and the Department of Energy (DOE) in October 2011.

SCE provides these comments as constructive recommendations for improvements on specific issues of importance to our utility operations consistent with our obligation to plan, permit, construct, own and operate transmission infrastructure to meet renewable energy procurement and transmission grid network reliability needs in a safe and cost-effective manner.

SCE believes that the Solar PEIS will, when complete, provide a framework necessary to support development of renewable energy resources on federal lands in the western United States—along with associated electrical transmission facilities and corridors to integrate Solar Energy Zones (SEZs)—while ensuring effective protection and conservation of native wildlife, plant species and the natural communities that support them.

California's renewable energy and climate change goals are among the most ambitious in the nation. In support of these goals, SCE procures more energy from renewable resources than any other utility in the country. Despite aggressive renewable energy procurement, challenges to meeting the state's renewable energy goals remain. These challenges include permitting and siting renewable energy projects as well as the expansion of existing and the installation of new transmission facilities. Therefore, the inclusion of transmission corridors in the Solar PEIS is a key element for the success of the SEZ approach. SCE supports efforts to streamline the approval of renewable energy generation projects as well as the necessary transmission system infrastructure to support such generation. This should facilitate development of environmentally responsible utility-scale renewable development in a timely fashion.

Transmission network upgrades and additions will be needed to safely and reliably interconnect and deliver renewable energy resources from remote areas of the state to

population centers. State and regional transmission planning efforts have identified some of the transmission upgrades and additions needed to meet today's renewable energy goals, based upon best available information. Uncertainty remains, however, as to the location, amount, and type of renewable energy resources that will be developed today and in the future, which in turn impacts the location and need for transmission infrastructure.

Integration of land-use and transmission planning efforts, informed by the Solar PEIS, will provide greater certainty resulting in a more orderly, rational, timely, and cost-effective state and regional transmission planning and permitting process. Coordination of the state and regional planning efforts of the California Independent System Operator (CAISO), California Public Utilities Commission (CPUC), the California Energy Commission (CEC), and the Western Electricity Coordinating Council (WECC), including broad stakeholder participation, is essential to achieving the state's goals and should be reflected in the Solar PEIS.

Facilitate Cost-Effective, Environmentally Sound Transmission Planning, Siting, and Permitting:

The Solar PEIS should facilitate cost-effective, environmentally sound transmission planning, siting, and permitting. We appreciate the Supplement's consideration in planning for sufficient transmission system upgrades and additions to integrate renewable energy resources. However, we encourage the Solar PEIS team to continue to engage with regional planning efforts, like WECC and others, to assist in identifying potential transmission corridors. Also, the Final PEIS should take into consideration the cumulative impact on the electrical grid resulting from multiple downstream transmission infrastructure changes to accommodate new renewable generation projects. Furthermore, the Solar PEIS should recognize the need for electric utilities to (i) acquire sufficient rights over public and private lands to support transmission corridors, upgrades and additions, and (ii) to hold such lands for future use consistent with the Solar PEIS planning horizon. This is important from a planning perspective as areas not reserved as transmission corridors may not be available by the time renewable energy plants are fully developed.

More specific comments about the Solar PEIS are:

Integration of Land Use Planning:

- Prioritize the designation of seamless, contiguous, strategically sized transmission corridors on public and private lands to facilitate transmission network upgrades and additions to safely and reliably support SEZs throughout the west.

  Designated corridors should include both federal and non-federal (private and public) lands. Designated corridors on federal lands should be withheld from other uses by DOI consistent with PEIS planning horizons. Also, the DOI/DOE should coordinate with the state, county and local agencies to hold non-federal lands for future use, consistent with the PEIS planning horizons.

Existing land management plans should be amended to show any new utility corridors to the extent those utility corridors are not incorporated into the DRECP. Corridors on non-federal lands should also be identified so that counties can incorporate corridors in their County General Plans.

- Provide flexibility to facilitate the identification of new and expanded transmission corridors that can accommodate new transmission lines, substations, upgrades and additions in the most cost-effective, environmentally sound manner. Utility corridors must be wide enough such that upgrades and additions can be located within a corridor, while avoiding areas with environmental sensitivities or engineering constraints.

- As described in Section 2.3.1.6 for solar projects, further assess expanded and new transmission corridors to accommodate the expected new transmission upgrades, additions, and related infrastructure to support each SEZ development. A typical industry yardstick for delivery of 1,200 MW is a 500 kV transmission line. Additionally, a maximum of two 500 kV transmission lines per transmission corridor, with proper separation distance (a minimum of 250 feet from center line to center line between the two lines), should be utilized in the land use planning. Compliance with these transmission planning standards will guard against building in new risks to grid reliability. The DOI/DOE should work with SCE, CAISO, and others to understand the location, number, and size of transmission lines needed to accommodate the anticipated capacity of renewable generation in the SEZs.

- Transmission lines located in proximity to SEZs may not necessarily have sufficient capacity to accommodate the anticipated renewable generation in the SEZs, nor may the lines meet reliability concerns if too many transmission facilities are located together.

- Clarify that exclusion areas do not necessarily apply to transmission line and appurtenant facilities (telecommunication, access roads, substations, etc.). For example, Table 2.2-1 indicates that areas with more than a 5% grade should be excluded. While the exclusion may be appropriate for a renewable generation facility, transmission lines are frequently built across terrain with greater than a 5% grade. In addition, Appendix D.2.5, p. D-4, lines 18-19, states that in some cases, transmission lines may be sited in environmentally sensitive areas that are not suitable for locating SEZs.

- Recognize the importance of timely planning and permitting projects to maintain a reliable transmission grid. Current planning and construction timeframes for transmission can take up to ten years. Therefore, it is important to simultaneously include land use planning for transmission lines in conjunction with the creation of SEZs to facilitate timely and successful permitting and siting of transmission lines and associated facilities to interconnect renewable generation projects. This would be similar to the Energy Policy Act of 2005-Section 368 corridor planning process.

- Section 2.2.2.2.5 proposes to identify new SEZs and amend applicable land use plans within a 12-18 month time frame. We encourage that transmission considerations be included as part of that analysis and time frame.

- Encourage the use of existing roads, transmission rights-of-way, and corridors, wherever possible, consistent with all applicable reliability planning criteria required by the North American Electricity Reliability Corporation (NERC), WECC, and the CAISO.

- Establish a policy that supports prioritizing and expediting interagency permit processing for transmission network upgrades and additions which support integration of SEZs with the grid.

  Near term priority should be given to transmission network upgrades and additions that may be needed to serve geographic areas that have been identified as potential high solar resource value, low environmental/cultural conflict locations such as the Western Mojave and Chocolate Mountains.

- The PEIS should be robust enough to allow future requests for transmission infrastructure and corridors to be evaluated in an Environmental Assessment and not a second Environmental Impact Statement.

- Clearly identify that BLM Section 7 consultation—under the federal Endangered Species Act (ESA) with the US Fish and Wildlife Service (USFWS)—will cover transmission line permitting, construction (including upgrades), and later operations and maintenance activities on public and private lands. Utility transmission lines often cross through both public and private lands to deliver energy from SEZs to load centers. If the ESA consultation does not include the private land component, the applicant would need to work with the USFWS to prepare a Habitat Conservation Plan under Section 10 of the ESA, which would result in project delays.

- Coordinate with state and federal permitting agencies to establish a compensatory mitigation program for SEZs, including a methodology to determine the mitigation ratio necessary for restoration or offset land purchases that will be followed by all involved federal and state permitting agencies, and not result in duplicative mitigation. The lead federal agency must ensure that the total mitigation is appropriate to the scope of the impact.

Coordination with Agencies:

- Coordinate with the CAISO's Transmission Planning Process (TPP) to ensure that transmission upgrades and additions needed to support renewable energy development in areas identified by the Solar PEIS are considered for inclusion as "public policy driven projects", including California's 33% Renewable Portfolio Standard (RPS) target by 2020 and other states' future RPS targets.

- Coordinate with long term, comprehensive energy and environmental planning efforts, including the DRECP and California Public Utilities Commission (CPUC) Long Term Procurement Plan (LTPP), to direct development to high renewable resource value, low conflict SEZs.

- Coordinate with the WECC regional transmission planning efforts to ensure consistency and compatibility across the western region of North America. Coordination of state and regional planning efforts could lead to a fully integrated west-wide transmission system, taking advantage of generating characteristics of both variable and flexible generation to lower costs, increase reliability, and to facilitate "system balancing" across broad geographic regions to "smooth out" the variability of renewable energy resources.

Transmission Analysis:

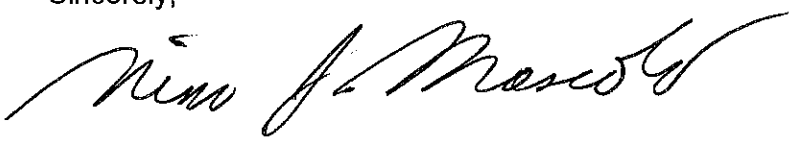
The Test Case Transmission Analysis for the Proposed Brenda SEZ has flaws in its assumptions. The analysis was performed without taking into account other SEZs, and assumes that power can be readily exported from the Brenda SEZ to the Los Angeles load center without downstream upgrades and without accounting for generation projects in the queue.

The final PEIS should instead establish a methodology to identify and designate transmission corridors sufficient to support transmission network upgrades and additions needed to deliver power from SEZs to load centers, taking into account all relevant factors, including the potential energy deliveries from a SEZ, optimizing existing infrastructure, and minimizing the need for new corridors and infrastructure.

Conclusion

Thank you for the opportunity to provide comments and suggestions to the Solar PEIS. SCE looks forward to working with you to ensure that the Solar PEIS facilitates cost-effective, environmentally sound transmission planning, siting, and permitting.

Sincerely,



Nino Mascolo
Manager, Government Lands and Forestry
Telephone 626.302.4459
FAX 626.302.9439

Thank you for your comment, DENISE LOUIE.

The comment tracking number that has been assigned to your comment is SEDDsupp20087.

Comment Date: January 26, 2012 18:49:05PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20087

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State:
Zip:
Country:
Privacy Preference: Withhold address from public record
Attachment:

Comment Submitted:

I understand and agree we need clean energy and lots of it. In pursuit of clean energy, I urge you to adopt the principle of "First Do No Harm." There are living things in our deserts. We've already made a mess of the natural world by imposing our civilization upon it and by trying to remake it. We need to help heal the natural world, not disrupt more of it.

We are at a crossroad. We must acknowledge our responsibility to the earth, which has sustained us but which has started kicking back for all the disruptions we have caused. I know many groups of people that agree. We must take positive steps to heal the earth without causing more disruption.

Now please do the right thing by Mother Earth. Stop, reverse and prevent fast-track approvals for solar installations on all public land; allow time and properly study potential impacts to ecosystems. Meanwhile, encourage city dwellers to solarize their rooftops, instead.

Thank you for your comment, Jeremy Drew.

The comment tracking number that has been assigned to your comment is SEDDsupp20088.

Comment Date: January 26, 2012 18:54:54PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20088

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Attachment: 2012-01-17 Final Lincoln County NV Ltr and Comment to Solar SPEIS.pdf

Comment Submitted:

Board of County Commissioners

Lincoln County, Nevada

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COUNTY CLERK
Lisa C. Lloyd

January 17, 2012

Solar Energy Draft Programmatic EIS
Attn: Ms Heidi M. Hartmann, Document Manager
Argonne National Laboratory
9700 Cass Avenue - EVS/240
Argonne, Illinois 60439

RE: Comments to Draft Supplemental Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

Dear Ms. Hartmann:

Lincoln County, Nevada has completed a comprehensive review of the Draft Supplemental Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (DSPEIS) and provides the following comments thereto. Lincoln County has participated extensively in the National Environmental Policy Act (NEPA) process leading to release of the DSPEIS for public comment. During the summer of 2009, Lincoln County, through the Bureau of Land Management's Nevada State Director, requested that proposed Solar Energy Zones in Delamar Valley, Dry Lake Valley North and in the vicinity of the East Mormon Mountains be included in the scope of the Programmatic Environmental Impact Statement for Solar Energy Development (PEIS). The Board of Lincoln County Commissioners believes that utility-scale solar energy development on BLM-administered land, if done in the right locations, at an appropriate scale and in a manner which avoids, minimizes and/or otherwise mitigates impacts to other multiple uses, particularly to permitted grazing of livestock, can contribute to energy security in the United States and provide important economic and fiscal benefits in Lincoln County.

At BLM's invitation, Lincoln County executed a Memorandum of Understanding with the Bureau of Land Management and Department of Energy on August 3, 2009 wherein Lincoln County became a Cooperating Agency regarding preparation of the DPEIS. In a

letter dated September 8, 2009, Lincoln County provided BLM's PEIS contractor with extensive comments on the scope of issues to be addressed with the DPEIS. In this letter, Lincoln County also requested that BLM significantly reduce the size of and recommended specific locations for the boundaries of the Delamar Valley SEZ, the Dry Lake Valley North SEZ and the East Mormon Mountains SEZ. Over the past year, Lincoln County has, in its role as a Cooperating Agency, reviewed and provided extensive written comments to Chapters 3, 5, 6, 7, 11.2, 11.4 and 11.5 of the Administrative Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (ADPEIS).

In a March 7, 2011 letter, Lincoln County provided BLM's PEIS contractor with comprehensive comments to the DPEIS. Lincoln County's comments have consistently sought to encourage BLM to identify and evaluate SEZs in Lincoln County of appropriate scale and location, which avoid or minimize impacts to other multiple uses, particularly to permitted grazing of livestock and recreation. Lincoln County's many previously submitted comments have also been intended to improve the accuracy and scientific defensibility of the Programmatic Environmental Impact Statement for Solar Energy Development. Lincoln County desires that the PEIS serve to facilitate expeditious utility-scale solar development on select public lands in the County.

The DSPEIS has responded favorably to many comments submitted by Lincoln County on the DPEIS. Lincoln County is particularly pleased that BLM/DOE have elected to eliminate the proposed Delamar Valley and East Mormon Mountain SEZs from further consideration. Lincoln County commends BLM/DOE for reducing the size of the proposed Dry Lake Valley North SEZ, although the area of the SEZ in the DSPEIS remains excessive and should be further reduced to 10,000 acres contained wholly within the Ely Springs Cattle Grazing Allotment. The former Delamar Valley SEZ, the East Mormon Mountains SEZ and the area of Dry Lake Valley North SEZ dropped from further consideration by BLM should be permanently designated as Solar Exclusion Areas. None of this "unsuitable" acreage should be available as Solar Right-of-Way Variance Areas.

Unfortunately, review of the DSPEIS by Lincoln County indicates a document which has not responded to many of the substantive comments offered over the past several months by the County. Most importantly, BLM's Preferred Alternative, the Modified Solar Energy Development Alternative, leaves open the potential for solar energy development to be proposed by developers in areas of Lincoln County at which significant impacts to other multiple-uses of public land would result. To avoid or minimize impacts of the Modified Solar Energy Development Alternative, Lincoln County suggests that BLM adopt an alternative which places a higher level of emphasis on development within SEZs and more requirements for coordination and consultation with local government. With the current expansive "Variance Area" and process, it appears that the current BLM Preferred Alterative is much more favorable to industry than local government and public land users. Alternatively, a "Modified SEZ Alternative" that includes the process for developing new SEZs seems to be the most logical solution.

The DSPEIS proposed Dry Lake Valley North SEZ coupled with the expansive Variance Area would enable solar energy development in Lincoln County at a scale and in

locations which will not effectively avoid or minimize adverse impacts to the environment and permitted public land uses, especially range livestock grazing. Lincoln County encourages BLM and the Department of Energy (DOE) to consider and address the following comments when preparing the Final Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States (FPEIS).

General Comments

1. The County recognizes the value of combining solar development activities into an energy park (SEZ) rather than widely dispersed solar installations and existing right-of-way application processes. As such, the County OPPOSES the **Modified Solar Energy Development Alternative (BLM's Preferred Alternative) and supports Modified Solar Energy Zone Alternative** provided that SEZs are located in areas that limit the impacts to other multiple uses, critical habitats and resource values. **Lincoln County recommends that the FPEIS and any related Record of Decision identify the Modified Solar Energy Zone Program Alternative as the BLM Preferred Alternative.**

SEZs should be located in areas with "Low Potential for Conflict" per the Screening Criteria listed in Instruction Memorandum No. 2011-061 regarding Right-of-Way Management for Solar and Wind Energy issued by the Department of the Interior on February 7, 2011.

The Modified Solar Energy Zone Alternative will limit the exorbitant amount of time, money and energy (on behalf of the County, local stakeholders and State and Federal Agencies) that goes into making sure that solar development rights-of-way are "smart from the start" and sited in appropriate locations.

2**.** Lincoln County continues to fully support the Renewable Energy Goal found on page 73 of the Ely District Record of Decision and Approved Resource Management Plan dated August 2008 (BLM/NV/EL/PL-GI08/25+1793) that states "Goals – Renewable Energy: Provide opportunities for development of renewable energy sources such as wind, solar, biomass and other alternative energy sources while minimizing adverse impacts to other resources."

3. The County supports BLM's decision to eliminate the Delamar Valley and East Mormon Mountain SEZs and a large portion of the Dry Lake Valley North SEZ. To further avoid or minimize significant environmental and land use impacts, the County recommends that the Dry Lake Valley North SEZ be further reduced in size to 10,000 acres located entirely within the Ely Springs Cattle Grazing Allotment. Because of the high conflicts with existing and beneficial resources that serve Lincoln County and its citizens, Lincoln County will not support potential projects outside of the 10,000 acres described above.

4. Lincoln County does not support maintaining the former Delamar Valley and East Mormon Mountain SEZs and the eliminated area of the Dry Lake Valley North SEZ as solar variance areas. Rather, the Final Solar PEIS should identify these areas as solar exclusion areas.

5. To avoid or minimize impacts of solar development on U.S. Air Force combat flight training; such development within the Dry Lake Valley North SEZ should be limited to a height of 200 feet.

Specific Comments

Attachment 1 contains Lincoln County's comments to specific chapters of the Draft Supplemental Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States.

I and my staff look forward to working with BLM, DOE, Argonne National Laboratory and their staffs in preparing a Final PEIS which facilitates utility-scale solar energy development on BLM-administered land in Lincoln County in the right locations, with specific technologies, at an appropriate scale and in a manner which avoids or minimizes impacts to other multiple uses, particularly to permitted grazing of livestock, and which contributes to energy security in the United States while providing economic and fiscal benefits in Lincoln County.

Sincerely,

George T. Rowe
Chairman

CC: Jane Summerson, Department of Energy
Linda Resseguie, Bureau of Land Management
Shannon C Stewart, NEPA Program Lead, BLM, Washington, DC
Rosemary Thomas, District Manager, Bureau of Land Management, Ely District
Victoria Barr, Field Manager, Bureau of Land Management Caliente Field Office
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Attachment 1
Lincoln County, Nevada
Specific Comments to Draft Supplemental Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States

Document Review Form
Supplemental Solar Energy Development PEIS

Reviewer's Names: Connie Simkins, (775) 726-3511, jcciac@co.lincoln.nv.us; Cory Lytle, (775) 962-5165, clytle@lincolnnv.com; Jeremy Drew, (775) 883-1600, Jeremy@rci-nv.com; Mike Baughman, (775) 883-2051, mikebaughman@charter.net

Reviewer's Organization: Lincoln County, Nevada

Primary Disciplinary Area (e.g., ecology, land use planning, regulatory oversight): Local Interest, County Infrastructure, Land Use, Grazing, Wildlife, Water, Socioeconomics

Section or Chapter Number: Chapter 1, Introduction

EIS Section	Page/Line	Comment/Suggested Revision
GENERAL COMMENT		Lincoln County believes the Supplemental PEIS has taken significant steps towards encouraging development within the designated SEZs, which is the County's preference. The County questions the need for a "variance process" for development outside of the SEZs at this time, especially in Nevada, for the following reasons: The "Reasonably Foreseeable Develop Scenario" (RFDS) for Nevada reported in Table 1.6-1 calls for 1,701 MW or 15,309 acres of solar development on BLM-administered lands over the next 20 years. Based on the assumptions used in this calculation, the County believes this is more than adequate to meeting Nevada's solar demand. Table 1.7-2 reports "Approved Solar Projects on BLM-Administered Lands as of August 15, 2011". The table listed 3 projects in Nevada totaling 1,057 MWs on 8,091 acres. Subtracting the approved Nevada Solar Projects from the RFDS leaves a demand for 644 MW on 7,218 acres of BLM-administered land. In addition, Section 1.7.2 reports that there are 25 pending solar applications within Nevada. Yet, the Supplemental DEIS currently identifies 60,395 acres of BLM-administered public lands as solar SEZs under the "Modified SEZ Alternative", plus allowances for modifying or developing new SEZs, plus allowances for a "variance process".

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		Lincoln County believes that the "Modified SEZ Alternative" has provided more than adequate lands for solar development within SEZs per its own RFDS analysis. As such, a moratorium on "variance applications" specific to Nevada should be implemented until: 1. All 25 pending applications are processed, and 2. Competitive offerings for development within the SEZs have been offered Such a moratorium will not curtail solar development in the event that a better development area is identified because a new SEZ could be established or an existing SEZ could be modified. This approach would allow BLM Nevada to catch up on pending solar applications, while providing time and focus for the SEZ-approach to get up and running. There is ample SEZ area to meet the RFDS within Nevada and there is no reason to spend more time, money and resources developing/processing additional "variance applications" until the SEZ approach is in place.
1.4	1-5 /32-34	Lincoln County understands that withdrawal of SEZ areas from mineral entry and applications for new rights-of-way may be necessary to prevent the filing of nuisance mining claims in areas planned for competitive leasing for solar development. Any such withdrawal or segregation of SEZs must not prohibit other ongoing multiple uses such as permitted grazing by livestock, public access and recreation.
1.5	1-6/19-21	Under the current definition of "utility-scale solar development" (20 MW or more), it is possible that projects utilizing current technologies could be as large as 200 acres and not qualify as "utility-scale". This is a significant disturbance area on public lands, especially in fragile desert ecosystems. The County suggests the definition of "utility-scale" be expanded to include any project that will impact more than 40-acres of public lands.
1.6	1-7/23-28	The calculation of the "Reasonably Foreseeable Development Scenario" (RFDS) is likely an over-estimation of solar demand as it doesn't take into consideration what percentage of each State's renewable energy portfolio standard has already been satisfied. The Final EIS should adjust the RFDS to account for this.
1.7.2	General Comment on "Pending Applications"	Lincoln County would prefer that pending solar applications (regardless of whether they are in or out of SEZs) be processed under the provisions of the ROD for the PEIS, particularly if they are early in the NEPA

EIS Section	Page/Line	Comment/Suggested Revision
		process. The June 30, 2009 date seems to be the more appropriate cut-off date, rather than the date of issuance of the Supplemental PEIS. This approach ensures a more consistent process, and better achieves the goals of the PEIS.
1.7.2	1-10/16-18 and 32-36	Lincoln County is in full support of the BLM's discretion to deny pending solar right-of-way applications that are insufficient or in zones of "High Potential for Conflict". This should include rights-of-way that are not supported by local and State governments, or where there has been a lack of local coordination by the project proponent.
1.7.2	1-11/14-15	"Pending applications on lands proposed as exclusion areas for utility-scale solar energy development in the Final Solar PEIS ***are likely candidates for denial***." The language ***in bold italic text*** should be stricken and replaced by "…shall be denied." Another sentence should be added for pending applications on lands proposed as variance areas. One suggestion would be "Pending applications on lands proposed as variance areas for utility-scale solar energy development in the Final Solar PEIS will have to meet the requirements of the variance process unless a Draft EIS has already been published."
1.7.2	1-12/11-12	This sentence indicates that in Nevada there are 25 "pending first-in-line solar applications". There should be a moratorium on any new "variance applications" until decisions have been made on these 25 pending applications.
1.8.2	1-14/22-29	The Final Solar PEIS and rulemaking should propose that BLM be authorized to utilize revenues from leasing of SEZs to undertake any additional NEPA compliance activities required by BLM to authorize construction and operation of solar projects within SEZs. In addition, the Final Solar PEIS and rulemaking should propose that BLM be authorized to utilize revenues from leasing of SEZs to design and implement measures to mitigate unavoidable impacts of solar development and operation upon other public land multiple-uses within or adjacent to solar projects.
1.8.2	1-14/31-35	The protracted schedule for the proposed rulemaking would effectively result in no leasing of SEZs for up to two years. To mitigate this excessive delay, BLM should commit to undertake an expedited rulemaking process which would result in a final rule completed by late Spring

EIS Section	Page/Line	Comment/Suggested Revision
		2012, or soon after the Solar PEIS ROD is anticipated to be issued.
1.8.2	1-15/32-36	If SEZs are to be leased on a competitive basis, then a system of land use authorization similar to that under BLM's geothermal leasing program should be adopted in lieu of Right-of-Way authorizations. Lincoln County agrees with the requirement for the submission on a POD, and recommends that the FSPEIS make clear that said POD would include measures to avoid or minimize impacts and mitigate unavoidable impacts. BLM's geothermal leasing program uses competitive leasing revenues to process land use authorizations for projects, not cost-recovery fees. In like fashion, SEZ lease revenues, not cost-recovery fees, should be used to process land uses authorizations and complete NEPA compliance for projects located within said competitive lease areas.

Section or Chapter Number: Chapter 2 – BLM Alternatives

EIS Section	Page/Line	Comment/Suggested Revision
GENERAL COMMENT		
2.1	General Comment on the "No Action Alternative"	Lincoln County does NOT support the "No Action Alternative"
2.2.1.1	Entire Section	This section fails to address the necessary changes in land use authorizations which would result if BLM implements a competitive leasing process. The Final Solar PEIS should describe a land use authorization process similar to that currently used by BLM for geothermal lease areas. In the case of geothermal lease areas, no right-of-way authorizations are required within individual or unitized lease areas. In addition, cost recovery fees are not required for geothermal project developers as such costs are paid for from the BLM proceeds of competitive geothermal leases. A similar program must be described here and elsewhere in the Final Solar SEIS for development within SEZs.
2.2.1.1	2-3/12-14	If it is anticipated that all ROW applications for solar projects will be Category 6, full cost-recovery applications, then where is the permitting time/cost savings attributable to the Solar PEIS? The extensive analyses completed for the Solar PEIS should enable BLM to complete processing of land use authorizations

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		for projects within SEZs in an expeditious and cost effective manner. Said anticipated savings in permitting time and cost must be discussed in the Final Solar PEIS.
2.2.1.1	2-5/21-28	The process and timeframes described here are apparently not being applied uniformly by BLM. Lincoln County is aware of an application for solar development in northern Delamar Valley which has been pending for 3 years without any apparent action by either the proponent to provide, or the BLM to require a Plan of Development (see Table A-1; NVN 086350). The Final Solar PEIS should provide a table of the status and schedule for BLM action on all pending applications for solar projects in the six-state study area.
2.2.1.1	2-5/35-45	Lincoln County does NOT support the "Notification of Livestock Grazing Operators" provision of the right-of-way authorization process. Every effort should be made to minimize impacts on existing valid uses of public lands. Rather than simply notifying the permittee that part of, or their entire permit may be canceled, the BLM and/or project proponent should work with the permittee collaboratively to develop a project that minimizes its impact on the operation. This is yet another reason that Lincoln County supports development only within SEZs because it will minimize or eliminate this sort of conflict with existing valid uses of public lands.
2.2.1.1	2-6/22-24	Lincoln County supports the BLM's requirement for all renewable energy developers to hold a Performance and Reclamation Bond.
2.2.1.1	2-9/34-40	This section of the final SPEIS should include the following text, "To avoid or minimize impacts of solar development on U.S. Air Force combat flight training; such development within the Dry Lake Valley North SEZ should be limited to a height of 200 feet.
2.2.1.2	2-13/36-37	Lincoln County does NOT support the following statement, "Development of an adaptive management and monitoring plan will be coordinated with potentially affected natural resource management agencies." This does not allow for coordination and consultation with local governments that may be affected (either positively or negatively) with the plan. This sentence should be altered to include "…with potentially affected natural resource management agencies***, state environmental and wildlife agencies, and any affected units of local government***."
2.2.1.2	2-14/1-4	Lincoln County is pleased to see that the BLM is working collaboratively with ARS and USGS to develop monitoring strategies, and encourages this partnership in

EIS Section	Page/Line	Comment/Suggested Revision
		the future.
2.2.2	General Comment on the "Modified Solar Energy Development Alternative"	Lincoln County remains in favor of the "Modified SEZ Alternative" over the "Modified Solar Energy Development Alternative – BLM Preferred Alternative". BLM's preferred alternative would be more palatable with a higher level of emphasis on development within SEZs and more requirements for coordination and consultation with local government. With the current expansive "Variance Area" and process, it appears that the BLM Preferred Alterative is much more favorable to industry than local government and public land users. Alternatively, a "Modified SEZ Alternative" that includes the process for developing new SEZs seems to be the most logical solution. The County believes some of the particular provisions of this alternative need to be revised to encourage and require closer coordination and consultation with local government (see various section-specific comments and suggestions). The County DOES support the SEZ concept, but does NOT support the variance process at this time (see general comments under Section 1.0 for more detailed discussion). The County believes that the variance process, specific to Nevada, should be suspended until the 25 pending solar applications are processed, and development within the SEZs is given an opportunity to succeed. Per this document, the BLM/DOE has identified significantly more acreage within SEZ designations than should be required over the next 20 years per the BLM's RFDS analysis.
2.2.2.1	General Comment on the "Proposed Right-of-Way Exclusion Areas"	Lincoln County supports the concept of Right-of-Way Exclusion Areas.
2.2.2.2	2-15/41-46	Lincoln County fully supports BLM's decision to drop the Delamar Valley and East Mormon Mountain SEZ as well as the reduced and reconfigured Dry Lake Valley North SEZ to include only that portion within the western half of the Ely Springs Cattle Allotment.

EIS Section	Page/Line	Comment/Suggested Revision
Table 2.2-1 "Revised Areas for Exclusion under the BLM's Modified Solar Energy Development Program Alternative"	2-16 and 17 13. and 14. 17. 26.	Lincoln County generally supports the Solar Exclusion areas, and offers the following suggestions: This should include Big Game Migratory Corridors and Winter Ranges identified by State Wildlife Agencies. It is our experience that the BLM Land Use Plans do not always have the most current information in this regard. National Recreational Trails and National Back Country Byways should also include an offset, similar to that for National Historic and Scenic Trails listed under 18. This list should include the Delamar Valley SEZ, East Mormon Mountain SEZ, and portions of the Dry Lake Valley North SEZ that have been dropped for consideration as SEZs. Lincoln County does NOT believe that these areas are suitable for solar development due to the high potential for resource impacts (especially cumulative impacts with other foreseeable projects) and conflicts with existing multiple uses.
2.2.2.2.2	2-19/45-46	Lincoln County supports Secretarial-level land use authorization decisions as described here.
2.2.2.2.3	2-24/14-16	If a ROW lease authorization is issued as a result of competitive leasing, then the normal cost-recovery process and fees applicable to ROW authorizations should not apply. Rather, as with BLM's competitive geothermal leasing process, lease revenues should be used by BLM to cover costs of authorizing solar project related land uses within solar lease areas. This approach to authorizing land uses authorizations within solar lease areas must be described fully in the Final Solar PEIS.
2.2.2.2.3	2-24 / 39-41	Lincoln County supports the development of regional mitigation plans, and supports the concept for such a plan that is specific to the County. The County is formally requesting to be involved in the development of this plan as a Consulting Agency, and supports inclusion of the plan in the Final PEIS.
2.2.2.2.3	2-25 / 6-7	Lincoln County supports the concept of developers funding conservation priorities identified in regional mitigations plans, as long as the regions are properly defined such that mitigation takes place in spatially and ecologically similar areas. For example, the County would not support funds derived from development in the Dry Lake Valley North SEZ to be used for mitigation in Clark County.
2.2.2.2.3	2-25 / 30-33	Counties should be included in this bullet point.

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2.2.2.2.3	2-26/13-15	This bullet-point appears to be in conflict with the text in Section 2.2.1.1, Page 2-3, Lines 12-14 which states that all ROW applications for solar projects will be Category 6, full cost-recovery applications. If all applications will be treated by BLM as Category 6 for purposes of cost-recovery, then where is the permitting time/cost savings attributable to development within SEZs. The extensive analyses completed for the Solar PEIS should enable BLM to complete processing of land use authorizations for projects within SEZs in an expeditious and cost effective manner. Said anticipated savings in permitting time and cost must be confirmed and discussed in the Final Solar PEIS.
2.2.2.2.4	2-26 / 42-45	Lincoln County understands that withdrawal of SEZ areas from mineral entry and applications for new rights-of-way may be necessary to prevent the filing of nuisance mining claims in areas planed for competitive leasing for solar development. Any such withdrawal or segregation of SEZs must not prohibit other ongoing multiple uses such as permitted grazing by livestock, public access and recreation.
2.2.2.2.5	General Comments on "Proposed Identification Protocol for New SEZs"	Lincoln County agrees that provisions should be made to allow for identification of new SEZs or to alter existing SEZs. However, as currently written the protocol does not make enough allowances for early coordination and consultation with local government. The following section-specific comments, and those offered under Appendix D, attempt to provide some ideas on how to improve this process.
2.2.2.2.5	2-28 / 21-24	The petition process should require any petitioner to contact and coordinate and consult with State and Local governments during the petition process. In fact, the petition application should require input from both entities. This will encourage early and continued coordination between the proponent/petitioner and permitting agencies, and will also help to avoid conflicts in developing new or altering existing SEZs.
2.2.2.2.5	2-28 / 36-38	Reviewing the need for new solar SEZs at a minimum of every 5 years seems excessive. Given the provision for outside entities to petition for new or altered SEZs, the BLM should revise this requirement to coincide with larger RMP updates or on an "as needed basis". This would save time and effort for both the BLM and all interested parties.
Figure 2.2-1	2-29	Lincoln County supports the general concept, but would recommend re-ordering the steps by switching Step 3 to

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		Step 2, so that environmental screening criteria have a higher priority. It makes no sense to explore a site's technical and economic feasibility if it is going to be disqualified in the next step by environmental constraints. In terms of Step 3, bullet #3 is essential to the process. Locally relevant screening criteria and considerations MUST be implemented for this process to work as intended. Local input and criteria will also help with the technical and economic feasibility criteria, particularly in regards to infrastructure access and local permitting. The current Step 2 "Establish Technical and Economic Feasibility Criteria" should include an additional bullet for "Ability to obtain State and Local Permits", this bullet should also be added to current Step 3 "Apply Environmental Screening Criteria"
2.2.2.3	General Comments on "Proposed Variance Areas…"	Lincoln County questions the need for a "variance process" for development outside of the SEZs at this time, especially in Nevada, for the following reasons: The "Reasonably Foreseeable Develop Scenario" for Nevada reported in Table 1.6-1 calls for 1,701 MW or 15,309 acres of solar development on BLM-administered lands over the next 20 years. Based on the assumptions used in this calculation, the County believes this is more than adequate in terms of meeting Nevada's solar demand. Table 1.7-2 reports "Approved Solar Projects on BLM-Administered Lands as of August 15, 2011". The table listed 3 projects in Nevada totaling 1,057 MWs on 8,091 acres. Subtracting the approved Nevada Solar Projects from the RFDS leaves a demand for 644 MW on 7,218 acres of BLM-administered land. In addition, Section 1.7.2 reports that there are 25 pending solar applications within Nevada. Yet, the Supplemental DEIS currently identifies 60,395 acres of BLM-administered public lands as solar SEZs under the "Modified SEZ Alternative", plus allowances for modifying or developing new SEZs, plus allowances for a "variance process". Lincoln County believes that the "Modified SEZ Alternative" has provided more than adequate lands for

EIS Section	Page/Line	Comment/Suggested Revision
		solar development within SEZs per its own RFDS analysis, and that doesn't account for permitted solar projects, or those in the planning pipeline. As such, a moratorium on "variance applications" specific to Nevada should be implemented until: 3. All 25 pending applications are processed, and 4. Competitive offerings for development within the SEZs have been processed **Such a moratorium will not curtail solar development in the event that a better development area is identified because a new SEZ could be established or an existing SEZ could be modified. This approach would allow BLM Nevada to catch up on pending solar applications, while providing time and focus for the SEZ-approach to get up and running. There is ample SEZ area to meet the RFDS within Nevada, there is no reason to spend more time, money and resources exploring additional "variance applications" until the SEZ approach is in place.**
2.2.2.2.6	2-30/entire section	This section does not recognize the ability to export solar energy between states in the six-state study area. The Final Solar PEIS should seek to balance supply and demand for renewable energy within the aggregated six-state study area not within individual states.
2.2.2.3	2-33 / 10-12	Under the current definition of "utility-scale solar development" (20 MW or more), it is possible that projects utilizing current technologies could be as large as 200 acres and not qualify as "utility-scale". This is a significant disturbance area on public lands, especially in fragile desert ecosystems. The County suggests the definition of "utility-scale" be expanded to include any project that will impact more than 40-acres of public lands.
2.2.2.3.1	2-33 / 30-31	Lincoln County disagrees with the statement that "Variances may be needed in the near-term because the lands identified as SEZs might be insufficient to accommodate demand for utility-scale solar development." Per the discussion offered under "General Comments" (above 2 entries) the SEZ area within Nevada is more than sufficient to meet solar demand as calculated by the BLMs RFDS analysis. Even if the designated SEZ area is too small to meet demand, this document provides for development of new SEZs. At least in Nevada, this statement seems to be unwarranted.
2.2.2.3.1	2-33 / 45-46	Lincoln County supports the concept of at least two pre-

EIS Section	Page/Line	Comment/Suggested Revision
	2-34 / 5-9	application meetings before solar rights-of-way or "variances" are filed. However, the second meeting should be held in close proximity to the proposed project (i.e. the "variance" meeting to coordinate with local stakeholders for projects in Lincoln County should be held in Lincoln County, not Reno or Las Vegas). It should be a requirement that local government is present for at least one pre-application meeting to ensure early coordination and consultation. However, it would be much better if a project proponent seeking a "variance" be required to consult with the local government and State as part of the variance application process. This ensures early coordination and will limit projects that have major obstacles from costing time and money during the pre-application hearing process.
2.2.2.3.1	General Comment on the "Variance Application Process"	Lincoln County generally agrees with the factors that BLM will consider as part of the application process and/or Plan of Development. In fact, this may be a list that needs to be incorporated into the new or revised SEZ development process. In addition, the County suggests adding the following requirements for the POD and for BLM consideration: • Any power purchase agreement for the power that will be generated • **Documentation that the project proponent has coordinated with State and local (County and/or municipal) government, and that local government is willing to provide required special use permits** ***This should be required of the developer for any new renewable energy right-of-way in order to avoid pitting local government against the project proponent and/or BLM due to a lack of early coordination. This will save time, money and effort for everyone in the long-term and result in less waste at all levels of government, and a much better end product with buy-in at all levels.***
2.2.2.3.1	2-38 / 16-20	Lincoln County agrees that the BLM should be coordinating with appropriate government agencies; however, some of this coordination should also be the responsibility of the project proponent as suggested in the previous comment.
2.2.2.3.1	2-39 / 37	Lincoln County does not agree with the statement

EIS Section	Page/Line	Comment/Suggested Revision
		"Communication with any potentially affected grazing permittee/lessee" as it does not meet the County's no net loss of grazing AUMs position. As described in Section 2.2.2.1 this means alerting the permittee/lessee that some or their entire grazing permit may be suspended. The County suggests changing this statement to "Coordination and consultation with any potentially affected grazing permittee/lessee to avoid, minimize or mitigate loss of grazing capacity." Replacing valid multiple uses with a singular use does not accomplish the BLM's multiple use mandate, and effort should be made to accommodate both forms of valid uses on public lands.
2.2.2.3.2	2-40 / 10-15	Lincoln County supports the BLM's authority to deny applications, the same authority should be afforded to SEZ petitions.
2.2.2.3.2	2-40 / 20	Lincoln County supports conducting these efforts at the State or field office level and would stress the importance of including the field office in order to facilitate direct coordination and consultation with local government.
2.3	2-42/33	This sentence should be revised to read, "Avoiding or minimizing potential negative environmental***, social, cultural, and economic impacts***."
Figure 2.3-4	2-47	This map is somewhat misleading in that it doesn't appear to account for the Solar Exclusion Areas.
Table 2.3-2	2-52 Rangeland Resources and Recreation	Identified impacts on these two multiple uses alone is why Lincoln County is much more favorable of the "Modified SEZ Alternative". There is too much potential for impact from the current "Modified Program Alternative" when the "Modified SEZ Alternative" provides ample development potential.
Table 2.3-1	2-53 Military and Civilian Aviation	Lincoln County is fully sportive of the DOD operations within Lincoln County and suggest that the BLM adopt any height limitations suggested by the DOD.
Table 2.3-2	2-53 Geologic Setting and Soil Resources	It is imperative that the project footprint is minimized to the greatest practical extent.
Table 2.3-2	2-54 Vegetation	It is imperative that the project footprint is minimized to the greatest practical extent.
2.3.1.3	2-68/35-43	If a ROW lease authorization is issued as a result of competitive leasing, then the normal cost-recovery process and fees applicable to ROW authorizations

EIS Section	Page/Line	Comment/Suggested Revision
		should not apply. Rather, as with BLM's competitive geothermal leasing process, lease revenues should be used by BLM to cover costs of authorizing solar project related land uses within solar lease areas. This approach to authorizing land uses authorizations within solar lease areas must be described fully in the Final Solar PEIS.
2.3.1.7	2-70/18-29 Table 2.3-3	This section and related Table 2.3-3 do not recognize the ability to export solar energy between states in the six-state study area. The Final Solar PEIS should seek to balance supply and demand for renewable energy within the aggregated six-state study area not within individual states.
2.3.2.7	2-75/entire section	This section does not recognize the ability to export solar energy between states in the six-state study area. The Final Solar PEIS should seek to balance supply and demand for renewable energy within the aggregated six-state study area not within individual states.
2.3.4	2-79/Table 2.3-4	The description here of the Modified SEZ Alternative to meet projected demand for solar energy development does not reflect the ability to export solar energy between states in the six-state study area. The Final Solar PEIS should seek to balance supply and demand for renewable energy within the aggregated six-state study area not within individual states.

Section or Chapter Number: Chapter 3, DOE Alternatives

EIS Section	Page/Line	Comment/Suggested Revision
GENERAL COMMENT		
3.1	General Comment to "No Action Alternative" for DOE	Lincoln County does NOT support the "No Action Alternative" as it relates to the Department of Energy (DOE).
3.2	General Comment to "Action Alternative – DOE's Proposed Programmatic Environmental Guidance"	Lincoln County DOES support the "Action Alternative" as it relates to the DOE. The only caveat to this support is an increased emphasis on early and continued local involvement in solar projects. The following section specific comments would strengthen the involvement of local and state entities in the solar development process in order to achieve the goals of the "General Mitigation Measures" and ensure incorporation of needed site and project-specific components.
3.2.1	3-1/35-36	Lincoln County DOES support "siting facilities in predetermined solar development zones" such as BLM designated SEZs, as long as the designation process

EIS Section	Page/Line	Comment/Suggested Revision
		includes approval from local and State government.
3.2.1	3-1/42-43	Lincoln County supports "…early correspondence between the applicant and appropriate permitting or interested government agencies" and would go one step further to make such correspondence mandatory for any solar project.
3.2.1	3-2/5-7	Lincoln County supports making "…early contact with local officials…" "…to explore all applicable regulations and address concerns unique to solar power generation projects". In addition, "early contact" should be more clearly defined. For public land projects, local officials (County and State) should be contacted and coordinated and consulted with prior to initiation of the EIS process, and ideally, prior to submission of an application for right-of-way, variance, SEZ designation, etc. "Local officials" should also be clearly defined to include the appropriate County (Planning Department and/or County Commission) and State (Energy Office, Department of Wildlife and/or Conservation) officials.
3.2.2	3-2/19-22	Lincoln County supports this statement, with the caveat that the term "Emphasize" be changed to "Require"and the inclusion of "holders of existing land use authorizations and permits".
3.2.2	3-2/24-29	Lincoln County supports these two statements.
3.2.3	3-2/34-37	Lincoln County fully supports these two statements.
3.2.3	3-2/39	Lincoln County fully supports the provision to "Avoid siting projects on prime or unique farmland" and would further support the inclusion of "…and rangelands."
3.2.3	3-2/41-46	Lincoln County fully supports avoiding impacts to the listed areas and would further support the inclusion of the statement "…lands identified as incompatible for renewable energy development by local government."
3.2.3	3-3/1-18	Lincoln County fully supports all of the statements as listed, and would suggest adding at least one more statement addressing coordination with the Department of Defense and/or FAA to coordinate development of projects in or near areas important for training and airspace.
3.2.4	General Comment on "Water Resources and	Lincoln County supports the statements as listed, and would stress the importance of minimizing project footprints to the greatest practical extent.

EIS Section	Page/Line	Comment/Suggested Revision
	Erosion Control"	
3.2.5	General Comment on "Biological Resources"	Lincoln County supports the statements as listed.
3.2.5	3-4/20-22	Lincoln County generally supports this statement; however, it should include state wildlife agencies in addition to state environmental agencies for early consultation.
3.2.5	3-4/25-26	Lincoln County generally supports this statement; however, wildlife migration corridors should be added to the list of "environmentally sensitive areas", alternatively the sentence could read "…critical wildlife habitats ***and migration corridors***"
3.2.5	3-4/37 and 40	The word "Consider…" should be changed to "Require…" for these two statements.
3.2.6	General Comment on "Air Quality"	Lincoln County generally supports the listed statements, and would emphasize the need for early coordination and consultation with local government, particularly County or municipal planning departments, to avoid conflicts with fugitive dust from solar development and operation with residential or other developed areas.
3.2.8	General Comment on "Visual Resources and Aesthetics"	Lincoln County generally supports the listed statements, and would emphasize the need for early coordination and consultation with local government, particularly County or municipal planning departments, to avoid conflicts with visual resources and aesthetics.
3.2.9	General Comment on "Socioeconomics"	A new bullet should be added as follows, "Ensure that purchased materials, supplies and equipment required to construct and maintain solar projects use the host local jurisdiction as the point of delivery to facilitate said jurisdiction securing full sales and use tax benefits for said purchases."
3.2.9	3-6 / 8	Lincoln County agrees with the statement to "Site facilities to maximize local, regional, and state-wide economic benefits" and believes the best way to do so is through early and continued coordination and consultation of siting projects with local and state entities (such as County Commissions, County Planning Departments, County/Regional/State Development Authorities, State Energy Offices, etc.). This would be a good addition to this statement.
3.3.1	3-7 / 36-41	This paragraph describes environmental mitigation recommendations and at one point in line 39 describes "…potentially applicable mitigation measures…". It

EIS Section	Page/Line	Comment/Suggested Revision
		is unclear if the DOE will require project proponents to develop mitigation measures or not. Development of mitigation measures to "avoid, minimize, and mitigate" environmental impacts should be required beginning with project scoping and continuing throughout the public NEPA process. Mitigation planning and implementation efforts conducted after the project is approved and permitted have a track record of poor success.

Section or Chapter Number: Appendix B, Solar Energy Zones Dropped from Further Consideration

EIS Section	Page/Line	Comment/Suggested Revision
B.3.1.3	B-20/12-15	Lincoln County does not support retaining the lands that composed the Delamar Valley SEZ as solar variance area. This area has now been extensively evaluated through the NEPA process and an individual solar project could not be sited in Delamar Valley which would effectively avoid the many environmental and land use issues which characterize this former proposed SEZ. Rather than being retained as a solar variance area the lands that composed the Delamar Valley SEZ should be identified as a solar exclusion area in the Final Solar PEIS. Furthermore, Lincoln County will not support proposed projects in this area because of issues stated in the Draft PEIS.
B.3.2.3	B-26/13-16	Lincoln County does not support retaining the lands that composed the East Mormon Mountain SEZ as solar variance area. This area has now been extensively evaluated through the NEPA process and an individual solar project could not be sited in the former East Mormon Mountain SEZ which would effectively avoid the many environmental and land use issues which characterize this location. Rather than being retained as a solar variance area the lands that composed the East Mormon Mountain SEZ should be identified as a solar exclusion area in the Final Solar PEIS. Furthermore, Lincoln County will not support proposed projects in this area because of issues stated in the Draft PEIS.

Section or Chapter Number: Appendix C, Action Plans for Solar Energy Zones to be Carried Forward

EIS Section	Page/Line	Comment/Suggested Revision
GENERAL COMMENT		Lincoln County supports eliminating 48,148 acres of the Dry Lake North SEZ from further consideration, and supports maintaining a solar SEZ designation in the western portion of the Ely Springs Cattle Grazing Allotment. However, the County would rather see these two SEZ designated as solar development exclusion areas than "Solar Variance Areas". Finding portions of these previously designated SEZs that are acceptable for solar development (and minimize impacts) will be most difficult, and require more time and money from all involved parties. **In particular, any portion of the previously designated SEZ located between the Robber Roost Hills and Ely Springs Range (east of the new SEZ boundary) MUST be defined as exclusion area as development in this area would disrupt a major mule deer migration corridor.**
GENERAL COMMENT		Within the remaining Dry Lake North SEZ, Lincoln County fully supports any design limitations, including development height restrictions, requested by the Department of Defense in an effort to minimize impacts to their aerial training missions in the area.
C.4.3.3	C-191/8-9	For reasons stated in its comments on the DPEIS, Lincoln County stands by its recommendation that the Dry Lake Valley North SEZ be limited to 10,000 acres all within the Ely Springs Cattle Grazing Allotment. Limiting the SEZ to this size will further avoid/minimize impacts to the environment, wildlife, existing authorized public land uses and DOD military training operations in the area while simultaneously providing sufficient land area for solar development commensurate with meeting Nevada's RFDS. The Draft Solar SPEIS offers no rationale for proposing the Dry Lake Valley North as an area in excess of 10,000 acres and, if the SEZ is not further reduced in size, such a rationale must be included in the Final Solar PEIS. Furthering the argument for limiting the Dry Lake Valley North SEZ is the fact that Lincoln County will require an approved Special Use Permit or in some cases, a full Development Agreement for any potential solar projects. Proposed projects in locations that conflict and negatively impact Lincoln County resources will be denied.
C.4.3.3	C-19/11-14	Lincoln County does not support retaining the lands that have been eliminated from the Dry Lake Valley North SEZ as solar variance area. This area has now been extensively evaluated through the NEPA process and an individual

EIS Section	Page/Line	Comment/Suggested Revision
		solar project could not be sited in the lands eliminated from the Dry Lake Valley North SEZ which would effectively avoid the many environmental and land use issues which characterize this location. Rather than being retained as a solar variance area the lands eliminated from the Dry Lake Valley North SEZ should be identified as a solar exclusion area in the Final Solar PEIS.
C.4.3.5.3	General to "Rangeland Resource" Section	Lincoln County supports re-evaluating the impacts to rangeland resources, and in particular existing grazing operations. The re-evaluation should include coordination with the permittees and the N-4 Grazing Board to best identify potential impacts.
C.4.3.5.4	General to "Recreation" Section	Lincoln County supports re-evaluating the impacts to recreation. The re-evaluation should include coordination and consultation with the recreational interests and the County to best identify potential impacts. Efforts should be made to ensure a no net loss of access to public lands adjacent to the SEZ.
C.4.3.5.8	C-194/26-41	The Final Solar PEIS should clarify that the long-term monitoring of water resources and related stakeholder committee and performance of groundwater modeling analyses would not be required for photovoltaic projects which require very little water during construction and operations. This section discusses preparing a planning-level water resource inventory and groundwater model. This particular hydrographic basin has recently been subject to water right hearings specific to groundwater applications filed by the Southern Nevada Water Authority (SNWA). The Nevada Division of Water Resources (NDWR) has likely already prepared a water resources and water right inventory, and SNWA has already developed a regional groundwater model. These existing resources should be utilized to the practical extent to avoid duplication of efforts. Additionally, existing water rights holders, including the Lincoln County Water District, SNWA and Vidler Water Company should be contacted regarding the feasibility of leasing existing water rights rather than developing new water rights to serve future solar facilities. This may be another incentive to developing within the SEZ rather than filing for a variance. This section includes a great deal of discussion on

EIS Section	Page/Line	Comment/Suggested Revision
		identification of jurisdictional water and ephemeral drainages. Will the SEZ be revised to avoid such areas? The County would recommend doing so if this analysis is going to be completed rather than waiting for a tiered EIS process.
C.4.3.5.9	General to "Ecological Resources" Section	The County is generally supportive of additional data gathering, which should include identifications of vegetation areas dominated by white sage. **Any data gathering for wildlife species should be closely coordinated with the Nevada Department of Wildlife.**
C.4.3.5.9	C-195/33-35	The reduced area of the Dry Lake Valley North SEZ has avoided wetland/riparian habitat so there should be no requirement for preliminary evaluations of surface water in this area.

Section or Chapter Number: Appendix D, Proposed Identification Protocol for New Solar Energy Zones

EIS Section	Page/Line	Comment/Suggested Revision
Appendix D	Entire Section	In addition to a process for identifying new solar energy zones, the Final Solar PEIS should include a protocol for identifying new solar energy exclusion areas. Appendix D could be easily modified to include a process for identification of new solar exclusion areas.
GENERAL COMMENT		Lincoln County generally supports the concept of revising existing SEZs or developing new SEZs, ONLY IF there are provisions that mandate early and close coordination and consultation of SEZ development with both the State and County. The process currently included in Appendix D DOES NOT adequately require local involvement in developing or revising SEZs. Within the 5-step process identified in Appendix D, local involvement MUST occur within the first 3 steps, not relegated to step 4 or 5, which would require developers to invest too much money before any required consultation with local government. The County does not want to be in a position of opposing a project that has already had significant resources invested; every

EIS Section	Page/Line	Comment/Suggested Revision
		effort must be made to avoid this scenario.
D.1	Comments General to "Assessing the Need for New SEZs"	The BLM shouldn't be required to assess the need for developing new SEZs on a 5-year interval if the existing SEZs haven't reached capacity, particularly given the petition provision. The petition process as currently written completely undermines all of the time, effort and energy that has gone into developing the PEIS. Petitions should only be considered if there is a compelling reason why the proponent cannot develop a project within an existing SEZ. Any petition should be required to gather formal comments from both the County and State of Nevada regarding suitability of the proposed SEZ location. Comments should include the support or opposition of the commenting agency to the proposed site, and any foreseeable constraints to development in the SEZ. This input should be required as part of the petition so that BLM can assess local support or opposition to the project. It also ensures that the proponent is coordinating and consulting with local government early in the process, thereby eliminating the scenario described in the above General Comment.
D.2	Comments General to "Establishment of Technical and Economic Feasibility Criteria"	Lincoln County generally agrees that such feasibility information and criteria should be established; however, the County questions the logic of this being the second step in the process. If an SEZ is going to be screened out in the following step because of environmental limitations it seems like a waste of resources to complete this step first. Only environmentally feasible sites should be considered before further technical and economic feasibility work is completed or required.
D.3	Comments General to "Apply Environmental Screening Criteria"	Lincoln County would suggest this become Step #2 in the process.
D.3.1	Program Exclusion Areas	Lincoln County believes that all of the area of the proposed 67,000 acre Dry Lake Valley North SEZ, except the western 10,000 acres within the Ely Springs Cattle Allotment already identified by Lincoln County as suitable for utility scale solar development should be identified as an Exclusion Area.
D.3.3	Comments	Lincoln County believes this is one of the most

EIS Section	Page/Line	Comment/Suggested Revision
	General to "Additional Locally Relevant Screening Criteria"	important steps in the process, and the current language in this section is not strong enough to ensure adequate local input. Please refer to the following comments for suggestions on improving this step of the process.
D.3.3	Page D-5 / Line 32	This section currently reads, "State and field offices undertaking efforts to identify or expand SEZs ***may*** choose to identify and apply additional screening criteria based on local conditions and institutional knowledge in consultation with other local, State and federal authorities and Tribes." The "may" should be changed to "shall". Coordination with the listed stakeholders is absolutely imperative to developing an SEZ that is feasible and supported by the local community. Additional criteria should be added to require the State and/or field office to determine the general level of support or opposition of the SEZ by the local and state government, and part of the screening criteria should be determining if a project in the area could obtain all necessary local and state permits. This needs to be identified early in the process to avoid wasting time, money and resources. A pre-NEPA scoping meeting (similar to the proposed pre-applications meetings in the Variance Process) should also be held in the local community where the new or altered SEZ is to be located, in an effort to gain all possible "institutional knowledge". This also encourages early community engagement and buy-in as part of the process.
D.3.3	Page D-5 / Line 43-46	This sentence should include "potential interference with existing authorized land uses". This is a key item to analyze since solar development alters public land use from multiple use management to sole use.
D.4.1	General Comments Regarding "Identification of Disturbed Sites"	Lincoln County supports the identification of disturbed sites for SEZs and solar development in general. This limits the disturbance of fragile desert ecosystems. That being said, areas that have burned and crossed an ecological threshold due to invasion of noxious or invasive weeds should be considered "disturbed sites".

Thank you for your comment, Doris Lawless.

The comment tracking number that has been assigned to your comment is SEDDsupp20089.

Comment Date: January 26, 2012 19:10:26PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20089

First Name: Doris
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Country: USA
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Attachment:

Comment Submitted:

I am requesting an extension of the public comment for the Solar PEIS Supplement in order to to provide sufficient time to analyze the effects of adding such an expansive area to the project. One major reason is the effect it will have on our National Park.
I am in favor of Solar Power. We need to end Oil and coal, but let's not ruined another part of our environment while extending our solar option.
What is the impact on the environment? What other process can be used?
Or are we just enhancing the wealth of the persons or companies that are proposing this project?

Thank you for your comment, Shaun Gonzales.

The comment tracking number that has been assigned to your comment is SEDDsupp20090.

Comment Date: January 26, 2012 19:18:44PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20090

First Name: Shaun
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Last Name: Gonzales
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Address 3:
City: [Withheld by requestor]
State: [Withheld by requestor]
Zip: [Withheld by requestor]
Country: [Withheld by requestor]
Privacy Preference: Withhold address from public record
Attachment: Comments on the Supplement.docx

Comment Submitted:

26 January 2011

Department of Interior and Department of Energy
Washington, D.C.

Re: Supplement to the Draft Solar Programmatic EIS

Please consider the following comments in response to the Supplement for the Draft Solar Programmatic Environmental Impact Statement (PEIS).

I support the Federal Government's intent in the Supplement to the Draft Solar Programmatic EIS (Supplement) to steer utility-scale solar energy development away from our most treasured and ecologically sensitive public lands. I believe the proposals in the Supplement, including the variance process and exclusion zones should be strengthened in the interest of responsible land stewardship, but also to support a more sustainable solar energy industry. I also believe it is incumbent upon the Departments of Interior and Energy to analyze alternatives that provide incentives for distributed generation and steer clean energy generation to already-disturbed lands.

Alternatives:
However, the scale of proposed renewable energy development on public lands, combined with other uses (fossil fuels, transmission lines, transportation, hunting, motorized recreation, hiking, camping, etc) place an unsustainable burden on our public lands. The Federal government's overarching emphasis on utility-scale renewable energy generation is irresponsible in light of these demands. For this reason, the Department of Energy (Energy) should consider a distributed generation alternative, including policies that could increase distributed clean energy generation such as Property Assessed Clean Energy (PACE) financing, and utilizing public buildings and parking lots for distributed generation deployment. In addition, both Department of Interior and Energy should strengthen their partnership with the Environmental Protection Agency's RE-Powering America's Land initiative to encourage energy development on already-disturbed lands.

Solar Energy Zones:
I support the removal of the Pisgah and Iron Mountain solar energy zones from the Draft Solar PEIS. The Pisgah SEZ fell within an "ecologically core" area, as identified by the Nature Conservancy's Mojave Desert Ecoregional Assessment, and subsequent surveys of plant and wildlife for the proposed Calico Solar power project. Along these lines, I believe that the Riverside East SEZ should be re-examined since industrial development in parts of the SEZ could disproportionately impact microphyll woodland. Such habitat is prevalent in the eastern portion of the SEZ. According to the US Fish and Wildlife Service, although such woodland constitutes only 0.5 percent of the desert land mass, it is believed to support approximately 80% of all bird nests in the Colorado/Sonoran deserts. These impacts should be closely examined.

Exclusion Zones:
Interior should designate all desert tortoise connectivity corridors (identified in Figure 2.2-2 of the Supplement) as exclusion zones. Particularly, the Ivanpah Valley (located in the eastern Mojave Desert, spanning Nevada and California near the city of Primm, Nevada) has exhibited robust desert tortoise populations, as well as other special status plants and wildlife, and is not suitable for further solar energy development. Interior has already permitted two projects (BrightSource Energy's ISEGS project, and First Solar's Silver State North) in the Ivanpah Valley. The ISEGS project alone is expected to impact hundreds of desert tortoises through displacement, translocation, and death. The Ivanpah Valley serves as a critical genetic linkage for the tortoise, but this linkage is narrow due to geography and development. For these reasons, Interior should add the entire Ivanpah Valley to its list of exclusion zones to prevent disrupting this ecological feature.

The Pisgah Valley should also be designated as an exclusion area. This area is identified as "ecologically core" in the Nature Conservancy's Mojave Desert Ecoregional Assessment, and hosts a diverse array of plant and wildlife.

Variance Process:
Although I believe all desert tortoise connectivity corridors should be treated as exclusion areas (not suitable for any solar development), in absence of such a requirement I would strongly support Option #2 for the Desert Tortoise Variance Process Requirements (section 2.2.2.3.1, page 2-35). In order to prevent further decline of this Federally protected species, it is imperative that we maintain tortoise habitat connectivity and genetic linkages, as noted in the revised recovery plan drafted by the US Fish and Wildlife Service. The condition regarding siting projects where native vegetation is "degraded", however, seems subjective and should be clarified because even land with "degraded" vegetation can still serve as a functional genetic linkage for tortoises. The maintenance of a suitable connectivity corridor at least three miles wide is a crucial aspect of this proposed requirement.

The rules established in the Solar PEIS should apply to all solar energy applications, and not just those submitted after October 28, 2011. Utility-scale solar facilities inherently require large amounts of land disturbance, and without requirements holding all developers to a variance process that maintains a healthy ecosystem, the intent of the Programmatic EIS is weakened.

Shaun Gonzales

Thank you for your comment, Kathleen Jennings.

The comment tracking number that has been assigned to your comment is SEDDsupp20091.

Comment Date: January 26, 2012 19:33:05PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20091

First Name: Kathleen
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Attachment:

Comment Submitted:

Please extend the review period for the draft PEIS to allow sufficient time for citizens to review the entire report--the proposed use of Morongo Basin land in particular is of great concern and deserves thorough understanding of the impact if approved.
Thank you

Kathleen Jennings

Thank you for your comment, Patricia Brennan.

The comment tracking number that has been assigned to your comment is SEDDsupp20092.

Comment Date: January 26, 2012 19:57:42PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20092

First Name: Patricia
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State: RI
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Attachment:

Comment Submitted:

Dear BLM folks,
As a citizen who wants both robust protection of America's wildlife and their public land habitats as well as encouragement of solar power generation, I am writing to encourage you to strengthen protections for wildlife and natural resources in the current draft of the Solar Program's environmental impact statement.

The solar energy zones--areas identified with few if any wildlife and natural resource conflicts--are such a superb idea. As a person with deep, territorial roots in Arizona, I commend you for both the Brenda and Gillespie SEZs that currently have maps on http://solareis.anl.gov/maps/index.cfm. They are the right way to go. The PEIS says that projects located in solar energy zones will have priority for development and I want your assurance that that will be so. Developing more designated SEZs -- giving both developers and citizens a clear, uncontested path to progress -- is the way to go. Excluding areas up front that have already been studied and found unsuitable because of wildlife and resource conflicts makes the most sense for everyone.

But the "variance process" is NOT the way to go. Reconsidering sensitive areas when more suitable areas have been agreed upon by both BLM and local citizens will only create expensive, contentious processes and slow action on solar development. Variances, if they are used at all, should be the exception and not easily obtained.

Also, please give priority to melding the great idea put forward by your own Tucson field office manager in this December 2011 interview:
"The[Restoration Design Energy Project] program is aimed at identifying BLM land that has already been used for other purposes, such as mining or sand and gravel operations. Then it is developing a "how-to" guide that shows those leasing BLM land how best to approach siting, location and use of land that already has been used for other purposes. The point is to preserve pristine land while making further use of land that already has been disturbed in one way or another, Bellow says. "
I think that immediate focus should be put on these "badlands" -- brownfields, old mining sites, abandoned gravel pits--as appropriate and probably less contentious SEZs that are begging for new productive uses. This gets us all an automatic "two-fer": badlands get a new lease on life as productive lands plus more sensitive and valuable natural resources and wildlife habitat will remain "out of the loop" of consideration for development.
So, one more time in a nutshell: keep up and speed up the great SEZ identification work like Brenda and Gillespie; lose or downplay the "variance" idea; and give those badlands greater priority for SEZs.
Thanks for considering my comments.
Yours sincerely,
Patricia B.M. Brennan [great granddaughter of territorial pioneers]
31 Sheldon Street
Providence, RI 02906
401-272-1759
carabadang@gmail.com

Thank you for your comment, judith marchyn.

The comment tracking number that has been assigned to your comment is SEDDsupp20093.

Comment Date: January 26, 2012 20:12:13PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20093

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Comment Submitted:

Please extend the public comment period for the

Thank you for your comment, Katja Irvin.

The comment tracking number that has been assigned to your comment is SEDDsupp20095.

Comment Date: January 26, 2012 20:29:16PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20095

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Comment Submitted:

I support the preferred solar zone alternative for solar development applications. Also, “variances” for solar development outside of solar energy zones should be limited and additional exclusion areas should be added to ensure that our most important habitat and ecosystems are protected from solar development.

Thank you for your comment, Paul Smith.

The comment tracking number that has been assigned to your comment is SEDDsupp20096.

Comment Date: January 26, 2012 20:41:14PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20096

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Attachment: 012612PEIScomments.docx.pdf

Comment Submitted:

TOURISM ECONOMICS COMMISSION
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CONTACT: Paul Smith, Chair
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To: US Bureau of Land Management
Supplemental Draft Solar PEIS COMMENTS
Argonne National Laboratory
9700 S. Cass Avenue, EVS/240

Submitted Electronically vis: http://solareis.anl.gov/involve/comments/index.cfm

January 26, 2012

To whom it may concern:

The Tourism Economic Commission is a nonprofit public interest association which has studied the economic impacts of the supplemental solar PEIS on business in the California Desert. Its members include people in the hotel business, real estate brokerage, restaurant, real estate rental, insurance, contracting, and the residential retirement community.

The Solar PEIS and its supplement will cause substantial economic damage to California desert businesses. The PEIS establishes a variance process that will allow development of solar industrial projects outside of solar energy zones in excess of 20 million acres. The variance lands are mapped for the energy companies' convenience in applying for permission to construct their sites.

The sites will contain large and prominent industrial equipment which will interfere with the wide open unobstructed desert views which tourists enjoy in the desert. These developments will prohibit entry by the public, damage soils for perpetuity, eliminate important wildlife habitat, destroy cultural resources, release substantial amounts of carbon dioxide stored in the soil, and seriously handicap one of our most important mitigations against climate change effects, namely wildlife coridors. These variance areas abut national park lands, federal wilderness areas, and military facilities.

The establishment of these variance areas is an implicit invitation by the federal government to the solar industry to construct their industrial solar facilities in the areas. Economic studies support the economic damage. (see Joshua Tree National Park Visitor Study, Fall 2010, University of Idaho, cited as "Jette, C., A. Blotkamp, Y,. Le., S. J. Hollenhurst. 2011. Joshua Tree National Park: Winter 2010, National Park Service, Fort Collins, Colorado", available on line at http://www.psu.udioahpo.edu). Tourism

visitation to Joshua Tree National Park is described in that report in detail. A separate economic analysis was performed by Professor Daniel Stynes of Michigan State (copy submitted).

This University of Idaho study concludes that Joshua Tree National Park was visited by 1.3 million visitors in 2010 with an economic effect on the local communities of over $58 million. Professor Stynes indicates that the local economic effect is $64 million. The University of Idaho report identified the ratings which visitors assigned to their Park visitor experience as follows:

Views without development	90%
Clean air	89%
Natural quiet, sounds of nature	87%
Desert plants/wildflowers	83%
Native wildlife	81%
Access to rock formations	78%
Solitude	73%
Dark, starry night skies	65%
Access to historical/cultural sites	52%

The message of course is that visitors find the above values very important to their reason for visiting this important desert National Park. Note that the above tourism value judgments are based on the natural values of the desert – values which would be seriously injured by the huge scale of solar development contemplated by the PEIS. Desert science tells us what is at stake.

Jim Andre, director of the University of California's Granite Mountains Desert Research Center tells us "This area is treasured by scientists throughout the world for its unparalleled pristine quality among deserts, one of the last functional ecosystems left on planet earth." And wildlife biologist Laura Cunningham indicates "This site is rich in life and needs to be preserved, not industrialized." Tourists understand these values and do not want to be surrounded and obstructed by huge solar fields and towers.

There would also be large impacts on property values which are not discussed in the PEIS. Numerous studies prove that wilderness enhances property values. The resulting decline in property values from solar development would unfairly injure property owners, and of course reduce property tax revenues to our cities and counties.

The PEIS does not deal with the economic impacts to the following business communities

- Tourism
- Attraction and retention of residents
- recreational opportunities
- property values

The PEIS opens over 20 million acres in the West for imprudently planned solar development. There are many national park units in this area and it is important to remember the collective economic impact of national parks:

- The National Park System produces nearly 270,000 private sector jobs
- There were 281 million recreational visits to our National Parks in 2010
- The amount of economic value to the public for each dollar invested in our national parks is $4 (not a bad bargain)

- National parks contributed $13.2 billion to our national economy in 2010, not including indirect spending.

The PEIS is fatally incomplete by its failure to deal with the above economic values. It is also defective in that it fails to deal with the potential for other methodologies to deal with energy and climate change:

- Conservation technology to reduce energy consumption
- Generation of renewable energy on a smaller scale at locations near to the point of use and which do not interfere with other important societal values
- "rooftop" energy generation
- If the above measures are not sufficient to meet our long-term renewable energy goals, then as a last resort large scale industrial solar plants should be located on disturbed and degraded land that offers little carbon sequestration, wildlife habitat and connectivity, and other natural values.

Sincerely,

Paul F. Smith
Tourism Economics Commission

Attached submittal: Economic Analysis by Professor Stynes

CONTRIBUTION

OF

JOSHUA TREE NATIONAL PARK

TO

LOCAL ECONOMY

(December 6, 2011)

A presentation dealing with economic variables and money market generation model at the National Parks Economic Symposium by:

Daniel Stynes, Ph.D.
(Recreation and Tourism Resources)
Professor Emeritus
Department of Community, Agriculture,
Recreation & Resources Studies
Michigan State University

Daniel Stynes
Michigan State University

Contribution of Joshua Tree NP to Local Economy

EXPERIENCE YOUR AMERICA

Outline

- Economic Impacts of National Parks
  - National estimates
  - MGM2 model
  - Joshua Tree
- Implications for Marketing/Promotion
  - Audiences
  - Visitor Market Segments
  - Spending Opportunities

2

NPS Impacts Economy thru

- Commercial Activities in Parks
- Visitor Spending on Trips
- NPS Payrolls
- NPS Operating Expenses
- NPS Construction
- Induced Development

3

National Economic Significance of NPS Visitor Spending, 2010

- 281 Million Visits
- $ 12.13 Billion Visitor spending in local gateway regions
- 258,000 Jobs
- $9.8 Billion Labor Income
- $16.6 Billion Value Added

4

Delimitations – Estimates Don't include

- Visitor spending outside local area
  - Airfares, car rentals, en route spending
- Purchases of durable goods,
- Spending at home
- Spending by non-visitors

5

National Economic Significance of NPS Visitor Spending , 2010

Sector/Spending category	Sales ($Millions)	Jobs	Labor Income ($ MM)	Value Added ($MM)
Direct Effects				
Lodging	3,120	32,202	1,002	1,715
Restaurants & bars	2,929	47,007	1,071	1,508
Grocery stores	253	4,247	129	209
Amusements	1,214	21,323	534	810
Gas stations	405	6,443	208	333
Local Transportation	422	8,118	212	263
Other retail	783	14,432	402	658
Wholesale Trade	472	2,344	180	310
Manufacturing	2,137	3,609	222	506
Total Direct Effects	**11,734**	**139,725**	**3,961**	**6,313**
Secondary Effects	19,346	118,691	5,851	10,310
Total Effects	**31,080**	**258,416**	**9,812**	**16,623**

6

National Payroll Impacts, 2010

- 26,000 NPS employees
- $ 1.62 Billion payroll
- 38,000 Jobs in gateway regions including induced effects of park payrolls

7

Impacts are Estimated Using Regional Economic models

- First must estimate spending = sales
- Translate sales into associated jobs, income
- Trace multiplier effects as spending circulates thru local, state, or national economies
- MGM2 is a spreadsheet model that carries out these calculations. We use it to estimate impacts of park visitor spending at 356 parks every year

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Elaborated/disaggregated Model

Economic Impact = VISITS * SPENDING * MULTIPLIER

Visitor Segments	Spending categories	Sector Specific multipliers
•Local Visits • NL Day Trips •Overnight Trips •Motel -Camp •Seas. Home •Inside or outside park	•Lodging •Restaurant •Groceries •Gas & oil •Amusements • Retail •....	• Capture rate • Direct ratios • Multipliers

MGM2 Inputs and Outputs

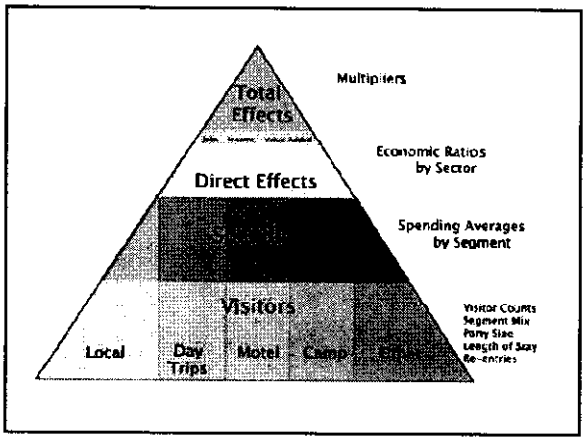
INPUTS

- Visits
- Conversion Factors
- Segment Mix
- Spending Averages
- Multipliers
  - Tax rates
  - Margins and Local Production

OUTPUTS

- Sales
- Income
- Jobs
- Value Added
- Direct & Secondary Effects
- Taxes (optional)

10



Joshua Tree 2010 Economic Impacts

Analysis of VSP by Phil Cook, Visitor Services Project, University of Idaho

12

Visitor Spending Impacts

- 1.44 Million visits in 2010,
  - 287,765 overnight stays
- $58.8 million visitor spending within 30 miles of park ($6.4 million inside park)
- Local impact
  - 732 jobs,
  - $23.4 million labor income
  - $37.9 million value added

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Joshua Tree Payroll Impacts, 2010

- 140 NPS employees
- $ 8.0 Million payroll
- Payroll Impact
  - 162 jobs
  - $8.8 Million Labor Income
  - $9.6 Million Value Added
- Payroll + Visitor Spending
  - 900 Jobs

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Local Region

- VSP spending question asked visitors to report spending in the park and in communities of Joshua Tree, Yucca Valley, and Twentynine Palms
- Economic region is defined as two county area
  - San Bernardino and Riverside counties

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Visitor Segments

	Segment					
Characteristic	Local	Day trip	Motel	Camp	Other OVN	All visitors
Visitor segment share (park entries)	8%	43%	24%	15%	10%	100%
Average visitor group size	2.2	2.5	2.7	2.9	2.4	2.6
Length of stay (days or nights)	1.0	1.0	1.9	2.7	2.5	2.3
Re-entry rate (park entries per trip)	1.1	1.1	1.5	1.7	1.3	1.3
Percent primary purpose trips	100%	62%	77%	88%	57%	71%

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Spending Averages ($ per party per trip)

	Segment				
Trip Spending	Local	Day Trip	Motel	Camp	Other OVN
Motels	0	0	246.08	0	0
Camping fees	0	0	0.49	31.30	0
Restaurants & bars	1.76	8.86	90.95	11.33	6.22
Groceries	0	4.34	27.83	26.88	3.42
Gas & oil	9.17	14.45	37.00	39.56	18.34
Local transp.	0	9.40	27.22	0	0.83
Admissions & fees	0	8.70	16.42	8.83	3.61
Souvenirs	0	7.94	19.38	13.52	3.08
Total	10.93	53.69	465.37	131.42	33.5
Inside park	0	13.12	14.3	46.75	6.41
Outside Park	10.93	40.56	451.07	84.67	27.09

EXPERIENCE YOUR AMERICA

Average Spending ($ per party per day/night)

	Segment				
Expenditures	Local	Day Trip	Motel	Camp	Other OVN
Motels	0	0	130.28	0	0
Camping fees	0	0	0.26	11.40	0
Restaurants & bars	1.76	8.86	48.15	4.13	2.49
Groceries & takeout food	0	4.34	14.74	9.79	1.37
Gas & oil	9.17	14.45	19.59	14.41	6.54
Local transportation	0	9.40	14.41	0	0.33
Admissions & fees	0	8.70	8.69	3.22	1.44
Souvenirs & other	0	7.94	10.26	4.92	1.23
Total	10.93	53.69	246.37	47.87	13.40

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JOTR Party Nights and Spending by Segment, 2010

Segment	Party Days/Nights (000's)	Pct	Spending ($000's)	Pct
Local	49,360	7%	$540	1%
Day Trip	226,792	34%	$12,123	21%
Motel	159,197	24%	$39,221	67%
Camp	114,550	17%	$5,484	9%
Other OVN	117,125	18%	$1,569	3%
Total	666,024	100%	$58,937	100%

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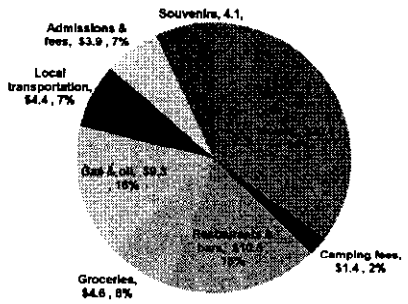
Total Spending $58.8 Million ($ Millions, %)



20

Local Economic Impacts of Visitor Spending

Sector	Sales ($000's)	Jobs	Labor Income ($000's)	Value Added ($000's)
Direct Effects				
Motels	20,619	187	6,496	11,602
Camping fees	1,369	16	548	709
Restaurants & bars	10,480	176	3,930	5,591
Groceries	1,167	18	618	1,003
Gas & oil	2,065	22	1,060	1,719
Local transportation	4,443	79	2,364	2,943
Admissions & fees	3,883	61	1,838	2,811
Souvenirs & other	2,067	39	1,083	1,761
Wholesale trade	1,011	6	383	657
Local manf	1,676	2	103	190
Total Direct Effects	**48,779**	**606**	**18,421**	**28,987**
Secondary Effects	15,987	125	4,976	8,894
Total Effects	**64,767**	**732**	**23,397**	**37,881**

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Limitations

- Accuracy rests on accuracy of the primary inputs
  - Visit counts, segment mix
  - Conversion factors
    - - party size, length of stay, re-entry rate
  - Spending averages (16% sampling error)
  - Multipliers

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Uses of Economic Impact Info

- Political Justification & Leverage
- Fostering Local Partnerships
- Evaluation of Management, Policy and Marketing Decisions (inside & outside park)
- Understanding relationships between the park and the surrounding region

23

Using MGM2 Results

- Public Relations/News Releases
- Evaluation of Alternatives (GMP)
- Fostering Partnerships
- Developing a regional perspective

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Target Audiences

- Political – national, state, local
- Partners – businesses, friends, …
- Visitors
- General Public

25

Regional Perspective

- Importance of partnerships
  - Park-gateway communities
  - Park concessions
  - Local Businesses
  - Local & regional tourism orgs
  - Other public recreation providers
- Packaging visitor experiences

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Keep in mind

- Most visitors stay outside the park
- Many visit multiple attractions on the trip
- Limited spending opportunities inside parks
- Visitor experience is the total trip package
  - Lodging, Food, Amusements, Recreation, Transportation, Information, Souvenirs
  - Inside and outside the park
  - NPS , partners, local communities, businesses

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Visitor Market Segments

- Geographic Segments and Trip Types
  - Local Residents
  - Day Trip Market
  - Overnight Trips
  - National/International markets
- Trip Purpose Segments
  - General Sightseers
  - Activity oriented
  - Park as Primary vs Secondary Purpose
  - Special Events

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More Information

- MGM2 Website
  - http://web4.canr.msu.edu/mgm2
- My broader economic impact website
  - Linked from MGM2
- E-mail : stynes@msu.edu

29

Thank you for your comment, George Hague.

The comment tracking number that has been assigned to your comment is SEDDsupp20097.

Comment Date: January 26, 2012 22:33:51PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20097

First Name: George
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Last Name: Hague
Organization:
Address: 26711 Ironwood Ave
Address 2:
Address 3:
City: Moreno Valley
State: CA
Zip: 92555
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

What Alternative sites have been identified?

Germany puts solar panels along major roadways. Is that one of your alternative sites?

Why are not the roofs of the millions of square feet of warehousing being used? Many of the roofs have the ability to handle the load. Why are not all new warehousing roofs being required to handle the additional load of solar?

What will you do when it is found that your methods of producing energy are outdated and should be discarded?

Your environmental document must list all other energy project in the both Riverside and San Bernardino Counties.

Impacts of transmission lines need to be fully explained.

Impacts from maintenance of those transmission lines and solar project needs to be fully explained.

Thank you for your comment, Stephen Merritt.

The comment tracking number that has been assigned to your comment is SEDDsupp20098.

Comment Date: January 26, 2012 22:49:12PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20098

First Name: Stephen
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Last Name: Merritt
Organization:
Address: 7995 Sunset Road
Address 2:
Address 3:
City: Joshua Tree
State: CA
Zip: 92252
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment:

Comment Submitted:

I request a 3 month extension of the public comment period in order to have an opportunity to respond to the Solar PEIS Supplement

Thank you for your comment, Michael Connor.

The comment tracking number that has been assigned to your comment is SEDDsupp20099.

Comment Date: January 26, 2012 23:52:54PM
Supplement to the Draft Solar PEIS
Comment ID: SEDDsupp20099

First Name: Michael
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Last Name: Connor
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Address 3:
City: Reseda
State: CA
Zip: 91335
Country: USA
Privacy Preference: Don't withhold name or address from public record
Attachment: 01-26-12-WWPCommentsSolarSDEIS.pdf

Comment Submitted:

See attached letter submitted by Western Watersheds Project. We are also submitting two research papers. Thank you.

Michael J. Connor, Ph.D.
California Director
P.O. Box 2364, Reseda, CA 91337-2364
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Working to protect and restore Western Watersheds

January 26, 2012

Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue-EVS/240
Argonne, IL 60439

Filed electronically through: http://solareis.anl.gov

COMMENTS ON THE SUPPLEMENT TO THE DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR SOLAR ENERGY DEVELOPMENT IN SIX SOUTHWESTERN STATES

To whom it may concern:

Western Watersheds Project thanks you for the opportunity to comment on the Department of Interior Bureau of Land Management ("BLM") and Department of Energy ("DOE") joint Supplemental Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States ("SDEIS").

Western Watersheds Project works to protect and conserve the public lands, wildlife and natural resources of the American West through education, scientific study, public policy initiatives, and litigation. Western Watersheds Project has over 1,600 members nationwide with offices in Arizona, California, Idaho, Montana, Utah, and Wyoming. Western Watersheds Project, as an organization and on behalf of its members, is concerned with and active in seeking to protect and improve wildlife habitats, riparian areas, water quality, and other sensitive resources and ecological values.

Western Watersheds Project recognizes that global climate change poses new challenges to our already stressed public lands. Scientists consider the challenges of conserving biodiversity to be even larger than mitigating the negative effects of global climate change.[1] While climate change threatens biodiversity and entire fragile ecosystems, our response to climate change also threatens our public lands and their wildlife. Thus, responsible siting of energy projects requires the use of comprehensive, ecologically sound, science-based analysis in determining power plant

[1] University of Copenhagen (2012, January 20). Biodiversity crisis is worse than climate change, experts say. ScienceDaily. Retrieved January 26, 2012, from http://www.sciencedaily.com-/releases/2012/01/120120010357.htm

locations. This is best achieved by focusing energy developments on private or severely altered lands that are located close to points of use to minimize new disturbance or further fragmentation of fragile, native ecosystems. The ecological impacts from renewable energy project development should be fully mitigated with significant and lasting actions.

Western Watersheds Project has actively participated in the NEPA process for this program proposal. We submitted scoping comments from our Boise, Idaho Office on July 7, 2008, from our California Office on July 15, 2008, and additional scoping comments from our California Office on September 10, 2009. Western Watersheds Project submitted comments on the DPEIS on May 2, 2011.

1. INTRODUCTION

In our comments on the DPEIS we urged the BLM to set out a Purpose and Need that addresses the Secretary's clear mandate to protect and enhance the Nation's water, wildlife, and other natural resources on the nation's public lands, to consider a range of alternatives in the PEIS including alternatives that meet energy needs but require no or minimal use of public lands, and to fully analyze the environmental impacts of current management and any proposed energy zones. We asked the BLM to consider the following five alternatives:

> (A) A climate change alternative that would exclude all public lands from solar energy development to provide maximum flexibility and opportunity for species and their habitats to survive climate change impacts;
> (B) An alternative that would use presence of an endangered, threatened or candidate species as an exclusion in the screening criteria so that SEZ are not designated on habitat for endangered, threatened or candidate species;
> (C) An alternative that constrains the range of technologies that could be used, to promote technologies that minimize water use and environmental footprints;
> (D) An alternative that focuses development on private land; and,
> (E) A distributed energy alternative.

Because these issues and alternatives have not been addressed in the SDEIS we are attaching and re-submitting our comments on the DPEIS comments as part of this comment letter on the SDEIS.

2. RANGE OF ALTERNATIVES

The selection and clear presentation of alternatives is the "the heart" of the NEPA process. NEPA requires the agencies to evaluate and compare a range of reasonable alternatives.

The BLM proposed three alternatives in the DPEIS: (1) A **no action** alternative that continues the issuance of right-of-way ("ROW") authorizations for utility-scale solar energy development on BLM administered lands on a project-by-project basis. (2) The **proposed action** under which approximately 22 million acres of BLM-administered lands would be available for

solar energy ROW applications of which approximately 677,400 acres (2,741 km^2) would be in solar energy zones ("SEZ"), where the BLM would prioritize development; and (3) A **solar energy zone alternative** that restricts applications to the SEZs only.

In the SDPEIS, the BLM now considers variations on the original alternatives. The BLM has dropped the Bullard Wash, Iron Mountain, Pisgah, Delamar Valley, East Mormon Mountain, Mason Draw and Red Sands SEZ; and, has reduced the sizes of the proposed Riverside East, De Tilla Gulch, Fourmile East, Los Mogotes East, Amargosa Valley, Dry Lake, Dry Lake Valley North and Afton SEZ reducing the acreage of the proposed SEZ to about 285,000 acres (1,153 km^2). The BLM now calls its Preferred Alternative the "Modified Solar Energy Development Program Alternative." Under this alternative, the BLM proposes categories of lands to be excluded from utility-scale solar energy development, identifies SEZs "where the BLM would prioritize development", proposes a process to identify additional SEZs, and allows for utility-scale solar development in variance areas outside of SEZs through what it calls a variance process. The second action alternative restricts applications to the modified SEZs only.

As with the alternatives considered in the DPEIS, all three alternatives considered in the SDPEIS would result in similar levels of industrial-scale solar power plant development on the Nation's public lands. The "no action" alternative would allow development to continue as it currently proceeds. The preferred alternative purports to restrict development to SEZ but allows for new SEZ to be developed and establishes a variance for proposed projects outside the SEZ. Alternative (3) the modified SEZ alternative purports to restrict solar power plant development to the designated SEZ, but SEZ can be expanded, added, or reduced in the future. BLM has not considered a single alternative that would avoid the whole-scale destruction of hundreds of square miles of important public lands and that would avoid impacted a multitude of special status species, recreational opportunities, visual resources, and host of other resources of these multiple-use lands.

NEPA requires agencies to rigorously explore and objectively evaluate all reasonable alternatives. BLM's analysis of a limited number of similar action alternatives makes this a grossly inadequate range of alternatives.

3. IMPACTS ANALYSIS AND POTENTIAL MITIGATION MEASURES

Relevant New Publications

Please consider and incorporate into your NEPA analysis the content and findings from the following publications that have appeared since the DPEIS was originally released. We have attached copies or provided a URL where the documents are available:

Hagerty, B. E, Nussear, K. E., Esque, T. C. and Tracy, C. R. 2011. Making molehills out of mountains: landscape genetics of the Mojave desert tortoise. Landscape Ecol. 26: 267–280.

Murphy R. W., Berry K. H., Edwards, T., Leviton, A. E., Lathrop, A., and Riedle, J. D. 2011. The dazed and confused identity of Agassiz's land tortoise, *Gopherus agassizii* (Testudines: Testudinidae) with the description of a new species and its consequences for conservation. ZooKeys, 113: 39-71.
[Available at: <http://www.pensoft.net/journals/zookeys/article/1353/the-dazed-and-confused-identity-of-agassiz>]

Lovich, J. E. and Ennen, J. R. 2011. Wildlife Conservation and Solar Energy Development in the Desert Southwest, United States. BioScience, 61(12): 982-992.

U.S. Fish and Wildlife Service. 2011. Revised recovery plan for the Mojave population of the desert tortoise (*Gopherus agassizii*). U.S. Fish and Wildlife Service, Pacific Southwest Region, Sacramento, California. 222 pp. Dated May 6, 2011. Released August 25, 2011.
[Available at: <http://www.fws.gov/endangered/recovery/index.html#plans>]

Selection of Solar Energy Zones

In response to concerns expressed by Western Watersheds Project and other organizations and concerned members of the public, the BLM has dropped the Bullard Wash, Iron Mountain, Pisgah, Delamar Valley, East Mormon Mountain, Mason Draw and Red Sands SEZ. It has also reduced the sizes of the proposed Riverside East, De Tilla Gulch, Fourmile East, Los Mogotes East, Amargosa Valley, Dry Lake, Dry Lake Valley North and Afton SEZ reducing the acreage of the proposed SEZ. While we certainly support the BLM's proposal to eliminate some of the SEZ and some of the acreage of others, even these eliminated areas do not seem to be safe from being industrialized under the proposed variance nor indeed do they seem to be safe from re-designation as SEZ down the road. The BLM must make it clear that once an area has been deemed unsuitable for energy development or as a SEZ it is taken of the table for the foreseeable future.

The SEZ that the BLM has removed from further consideration "had substantive resource conflicts." SDPEIS at 2-80. The SDEIS does not explain how the BLM managed to select these areas in the first place since the SEZ were supposedly areas of low resource conflict. In order to minimize potential adverse impacts, the BLM should drop the remaining proposed Solar Energy Zones too because they were not selected as areas with low resource conflicts at all, but were selected based on slope, proximity to utility corridors (which invariable pass through valleys and over bajadas) and existing land use designations. This resulted in the BLM effectively targeting desert tortoise habitat in California, Nevada, and Arizona. FLPMA § 201 [43 U.S.C. 1711] (a) requires the Secretary to prepare and maintain on a continuing basis an inventory of all public lands and their resource and other values (including, but not limited to, outdoor recreation and scenic values), giving priority to areas of critical environmental concern. This inventory shall be kept current so as to reflect changes in conditions and to identify new and emerging resource and other values." BLM needs to follow the law, develop an inventory of the public lands that is adequate for the job at hand, and then make a determination as to whether any of those lands lack resource conflicts. Without this comprehensive approach the BLM is simply making an arbitrary decision to sacrifice public resources for private gain.

Variance & Desert Tortoise

The proposed variance that would allow developers to build power plants on public lands outside the SEZ completely undermines any credibility behind the BLM's argument for designating SEZ in the first place.

The criteria suggested for allowing a variance to be considered are arbitrary, subjective, and based on unsubstantiated data. For example, for the connectivity criteria, the BLM provides a small map (FIGURE 2.2-2 Desert Tortoise Conservation Areas and Proposed Connectivity Areas) ostensibly showing "connectivity areas" but provides no explanation of how this map was developed, nor does it provide larger scale maps that would actually help the public understand where these connectivity areas are. We suggest the BLM provide more a more detailed explanation of the underlying science and a more detailed presentation of the results of the analysis. The BLM should also explain to what extent power plants that they have already authorized, such as the ISEGS plant, have compromised this connectivity. Without that, there is no baseline from which to determine the impacts.

The BLM is responsible for preparing and maintaining, on a continuing basis, a current inventory of the public land and its resources (FLPMA, 43 U.S.C. 1701 Sec.201 (a)). This inventory information, along with monitoring data collected under a variety of programs, shall be used to evaluate the current status and trends of plants and animals and their habitats on BLM-administered lands, and to respond to FWS and/or NMFS Federal Register Notices of species status review (e.g., 90-day, 12-month, 5-year, and annual candidate reviews). BLM Manual 6840 at 1B1a. The BLM should therefore repeat the connectivity exercise for all special status species found in the western states such as bighorn sheep that will be affected. Without this information, the BLM cannot provide assurance that its action will "minimize the likelihood of and need for listing of these species under the ESA." *Ibid*. at .02.

The BLM also provides a series of cut-offs decided by results of desert tortoise surveys. These are inadequate for many reasons. For one thing, the USFWS no longer considers population numbers as targets but rather relies on determining trends – is a population stable, declining or increasing? For another, just because current numbers in a particular area may be low does not imply that the population is unimportant. The population may be of considerable genetic significance (Murphy *et al*., 2011[2]; Brittan *et al*., 1997[3]). The area may provide connectivity but have no resident tortoises (see for example, Hagerty et al, 2011 identifying "least cost" pathways for potential gene flow; see Dr. Hagerty's thesis for a more detailed treatment of this issue[4]).

[2] Murphy, R. W., Berry, K. H., Edwards, T. and Mcluckie, A. M. 2007. A Genetic Assessment of the Recovery Units for the Mojave Population of the Desert Tortoise, *Gopherus agassizii*. Chelonian Conservation and Biology 6(2): 229–251.

[3] Britten, H. B., Riddle, B. R., Brussard, P. F., Marlow, R. and Lee, Jr., T. E. 1997. Genetic delineation of management units for the desert tortoise, *Gopherus agassizii*, in the northeastern Mojave Desert. Copeia 1997: 523-530.

[4] Hagerty, B. 2008. Ecological Genetics of the Mojave Desert Tortoise. Ph.D. Dissertation. University of Nevada, Reno. 244 pp.

Utah & Greater Sage-grouse

The SDEIS states, "To meet the objectives of BLM's sage-grouse conservation policy, the Solar PEIS has excluded specifically identified sage-grouse habitat (currently occupied, brooding, and winter habitat) located on BLM public lands in Nevada and Utah." SDEIS at 2-18. However, although we raised repeated concerns over greater sage-grouse, none of the proposed Utah SEZ has been modified to remove sage-grouse habitat.

Mitigation

In our previous comments and scoping comments, we proposed that BLM allow the retirement of grazing allotments as compensatory mitigation for impacts to special status species and their habitat. Senator Feinstein recently successfully authored legislation authorizing a similar process throughout the California Desert Conservation Area. The PEIS should include language for all alternatives that will programmatically modify all subject RMPs to allow for buyout and voluntary relinquishment of grazing allotments for conservation purposes. This will both reduce cumulative effects and provide opportunities for meaningful mitigation of impacts.

Western Watersheds Project thanks you for the opportunity to provide comments on the Supplement. We look forward to seeing these and our earlier recommendations incorporated in the next iteration of this document.

Sincerely,

Michael J. Connor, Ph.D.,
California Director
Western Watersheds Project
P.O. Box 2364
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Working to protect and restore Western Watersheds

May 2, 2011

Solar Energy Draft PEIS
Argonne National Laboratory
9700 S. Cass Avenue-EVS/240
Argonne, IL 60439

Filed electronically through: http://solareis.anl.gov

COMMENTS ON THE DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR SOLAR ENERGY DEVELOPMENT IN SIX SOUTHWESTERN STATES

To whom it may concern:

Western Watersheds Project thanks you for the opportunity to comment on the Department of Interior Bureau of Land Management ("BLM") and Department of Energy ("DOE") joint Draft Programmatic Environmental Impact Statement for Solar Energy Development in Six Southwestern States ("DPEIS").

Western Watersheds Project works to protect and conserve the public lands, wildlife and natural resources of the American West through education, scientific study, public policy initiatives, and litigation. Western Watersheds Project has over 1,600 members nationwide with offices in Arizona, California, Idaho, Montana, Utah, and Wyoming. Western Watersheds Project, as an organization and on behalf of its members, is concerned with and active in seeking to protect and improve wildlife habitats, riparian areas, water quality, and other sensitive resources and ecological values.

Western Watersheds Project recognizes that global climate change poses new challenges to our already stressed public lands. However, while climate change threatens biodiversity and entire fragile ecosystems, our response to climate change also threatens our public lands and their wildlife. Accordingly, WWP supports responsible development of power plant projects. Responsible development requires the use of comprehensive, ecologically sound, science-based analysis in determining power plant locations. This is best achieved by focusing energy developments on private or severely altered lands that are located close to points of use to minimize new disturbance or further fragmentation of fragile, native ecosystems. The ecological impacts from renewable energy project development should be fully mitigated with significant and lasting actions.

Western Watersheds Project has actively participated in the scoping process. We submitted scoping comments from our Boise, Idaho Office on July 7, 2008, from our California Office on July 15, 2008, and additional scoping comments from our California Office on September 10, 2009.

In our comments on the DPEIS we have followed the general approach of the DPEIS documents, and address the overall evaluation first followed by some comments on the individual state analyses. Because the mission of Western Watersheds Project is to protect public lands and their resources most of our comments are directed to the BLM.

1. INTRODUCTION, AND PURPOSE AND NEED

Western Watersheds Project does not believe that the best use of any of our Nation's multiple-use public lands is for single-use, industrial-scale energy development, nor do we believe industrial-scale energy development on public lands to be consistent with the Federal Land Policy Management Act ("FLPMA"). We do believe that the federal government should look to ways it can promote distributed energy, and use of brown fields, and other degraded areas within urban areas for industrial production to ensure that as many diverse wildlife habitats and areas of connectivity persist to facilitate changes species distribution due to climate change. That approach best protects and enhances the Nation's water, wildlife, and other natural resources as required by Secretarial Order 3285A1.

FLPMA mandates the BLM to manage the public lands "in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values" and to "manage the public lands under principles of multiple use and sustained yield." The utility-scale solar energy developments envisioned in the PEIS would require landscape level conversion of desert lands into vast industrial tracts. These tracts will be permanently and irreversibly degraded, and will no longer be available for multiple-use. Although the life of the solar power plants themselves is only expected to be 20-30 years, the character of these public lands will be permanently changed. FLPMA's mandates should be the primary driver for this planning process.

The DPEIS cites a number of Executive Orders, Congressional acts, and federal agency orders and policies that it states establish requirements for the agencies related to renewable energy development and that provide the drivers for specific actions being taken or being proposed by these agencies to facilitate solar energy development. DEIS at 1-2.

Executive Order 13212: Signed by President Bush on May 18, 2001 this Executive Order states "For energy-related projects, agencies shall expedite their review of permits or take other actions as necessary to accelerate the completion of such projects, while maintaining safety, public health, ***and environmental protections***. (Our emphasis added).

Energy Policy Act of 2005: Section 211 of the Act states, "It is the sense of the Congress that the Secretary of the Interior should, before the end of the 10-year period beginning on the

date of enactment of this Act, seek to have approved non-hydropower renewable energy projects located on the public lands with a generation capacity of at least 10,000 megawatts of electricity."

This is a recommendation by Congress, not a mandate. There is no obligatory requirement for the Secretary to do so, nor is there language in the Energy Policy Act that allows the Secretary to short-change environmental protections or identify large slabs of public lands for industrial development. The repeated claim made in the DPEIS that the Energy Policy Act requires the Secretary to approve 10,000 megawatts of new energy plants is simply untrue.

Energy Independence and Security Act of 2007: Section 603 of the Energy Independence and Security Act of 2007 requires the DOE to assess methods to integrate electric power from utility-scale solar facilities into regional electricity transmission systems, to identify transmission system expansions needed to move solar-generated electricity to growing electricity demand centers, and to consider methods to reduce the amount of water consumed by concentrating solar power systems. There is no mandate to use public lands for industrial solar development.

Secretarial Order 3285A1: This amended secretarial order dated February 22, 2010 sets a policy of "Encouraging the production, development, and delivery of renewable energy is one of the Department's highest priorities. Agencies and bureaus within the Department will work collaboratively with each other, and with other Federal agencies, departments, states, local communities, and private landowners to encourage the timely and responsible development of renewable energy and associated transmission ***while protecting and enhancing the Nation's water, wildlife, and other natural resources***. (Our emphasis added). It also calls for development of a strategy for "identifying and prioritizing the specific locations in the United States best suited for large-scale production of solar, wind, geothermal, incremental or small hydroelectric power on existing structures, and biomass energy (e.g., renewable energy zones)."

National Environmental Policy Act ("NEPA") Sec. 1502.13 requires that an EIS specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action. NEPA review cannot be "used to rationalize or justify decisions already made." 40 C.F.R. § 1502.5; Metcalf v. Daley, 214 F.3d 1135, 1141-42 (9th Cir. 2000). The statement of purpose and need is closely tied to the alternatives reviewed in a NEPA process since "the stated goal of a project necessarily dictates the range of 'reasonable' alternatives." City of Carmel, 123 F.3d at 1155. The Ninth Circuit reaffirmed this point in National Parks Conservation Assn v. BLM, 586 F.3d 735, 746-48 (9th Cir. 2009) (holding that "[a]s a result of [an] unreasonably narrow purpose and need statement, the BLM necessarily considered an unreasonably narrow range of alternatives" in violation of NEPA).

According to the DPEIS:

The scope of this PEIS is limited to utility-scale solar development, in part, because the Energy Policy Act of 2005 and DOI Secretarial Order 3285A1 require that the BLM take steps to facilitate development at that scale (see Section 1.1). The development of distributed generation, small-scale solar energy

facilities, such as roof-top mounted PV systems, is not included in the scope of this PEIS. While such solar energy development will be an important component of future electricity supplies (and is the focus of separate DOE initiatives; see Section 2.5.1), current research indicates that development of both distributed generation and utility-scale solar power will be needed, along with other energy resources and energy efficiency technologies (NREL 2010c). One analysis of available roof space concluded that up to 23% of required electricity supplies could be met with roof-top PV systems, although integrating PV into the electric grid at levels that high could be challenging (Denholm and Margolis 2008). On a per watt basis, small-scale PV systems are more expensive than utility-scale systems (NREL 2010c). DPEIS at 1-4;

The DPEIS states that BLM has identified utility-scale solar energy development as a potentially critical component in meeting the applicable orders and mandates discussed in Section 1.1. However, the DPEIS provides no meaningful justification as to why utility scale solar on public land is a critical component in meeting the listed Executive Orders, Congressional acts, and federal agency orders. It provides no justification for eliminating other alternatives off the bat such as distributed generation, promotion of small-scale facilities, and facilitating the use of private lands (even though Secretarial Order 3285A1 expressly requires "agencies and bureaus to work collaboratively with … private landowners to encourage the timely and responsible development of renewable energy and associated transmission."). The citations provided such as NREL 2010c are not primary references, not comprehensive, and not up to date.

The Purpose and Need section ignores the large amount of public land that is already being developed for solar power plants and the expected amounts of energy that would be generated. In the California Desert Conservation Area alone current solar energy project planning and development that is underway would produce over 19,100 MW from public lands, and a number of additional projects on public lands have been approved in Nevada.

Nor does the Purpose and Need section address the Secretary's clear direction to protect and enhance the Nation's water, wildlife, and other natural resources. Our public lands are the last, best places for native wildlife and rare plants. In the context of climate change, maintaining broad swaths of untrammeled landscapes connected by matrix habitat is the only approach to maintaining the flexibility needed to ensure that the greatest number of species will be able to move and adapt to changing conditions. Fragmentation through solar developments, and the accompanying transmission lines and roadways, reduces the chances of these species survival.

In sum, the BLM's Purpose and Need section is overly narrow and constrained in violation of NEPA, and does not even meet the requirements of many of the orders, acts and policies that the BLM claims to be driving this process.

2. RANGE OF ALTERNATIVES

The selection and clear presentation of alternatives is the "the heart" of the NEPA process. NEPA requires the agencies to evaluate and compare a range of reasonable alternatives.

The BLM considers the following three alternatives in the DPEIS:

(1) A **no action** alternative that continues the issuance of right-of-way (ROW) authorizations for utility-scale solar energy development on BLM administered lands by implementing the requirements of the BLM's existing solar energy policies on a project-by-project basis. Lands available for solar energy development would include those areas currently allowable under existing applicable laws and statutes (approximately 99 million acres in the six-state study area) and in conformance with the approved land use plan(s).

(2) The **proposed action**. A solar energy development program alternative that applies new program administration and authorization policies and design features for utility-scale solar energy development on BLM-administered lands to a subset of BLM administered lands that would be available for solar energy ROW applications (approximately 22 million acres. Within the available lands, the BLM would identify approximately 677,400 acres (2,741 km^2) in solar energy zones, which are lands identified by the BLM as best-suited for utility-scale production of solar energy and where the BLM would prioritize development (as well as development of associated transmission infrastructure).

(3) A **solar energy zone (SEZ) alternative** that applies the same new program administration and authorization policies and design features to utility-scale solar energy development but restricts applications to SEZs only (up to approximately 677,400 acres in the six-state study area).

All three alternatives considered in the EIS would result in similar levels of industrial-scale solar power plant development in the desert and/or would not achieve the stated purpose and need:

Alternative (1) the "no action" alternative would allow development to continue as it currently proceeds. Since all approved projects are now being litigated, this is clearly not an efficient and effective approach;

Alternative (2) the preferred alternative is poorly and incompletely described. It consists of identifying solar energy zones (SEZ) where BLM staff would prioritize applications and an additional, enormous area that would be open for development but where applications would receive a lower priority treatment from staff. The DPEIS does not explain why the BLM even wants to propose opening up 100 times more land than it has identified any need for, nor has staff to handle. How is this going to help the BLM respond in a more efficient and effective manner to solar power plant applications? How does this alternative protect and enhance the Nation's water, wildlife, and other natural resources? In fact, this alternative appears to have been thrown in at the last minute given the statement in the DPEIS that "Only those species that are known to occur in the SEZ regions are discussed in Appendix J because the need for an expanded species analysis by alternative was identified too late in preparation of the Draft PEIS to be accommodated in

this version of the document. It is anticipated that a discussion of all species with potential for impacts under each alternative will be developed between the Draft and Final PEIS." DEIS at RG-8. How could the BLM not be aware of the need to consider the impacts of its proposed action on threatened and endangered species?

Alternative (3) the SEZ alternative is the DPEIS' "Goldilocks alternative". Unfortunately, although it purports to restrict solar power plant development to the designated SEZ, this SEZ alternative is effectively the same as the proposed action since BLM can expand, add, remove, or reduce SEZs in the future.

NEPA requires agencies to rigorously explore and objectively evaluate all reasonable alternatives. BLM's analysis of a limited number of similar alternatives makes this a grossly inadequate range of alternatives.

The BLM has not considered the following alternatives:

(A) A climate change alternative that would exclude all public lands from solar energy development to provide maximum flexibility and opportunity for species and their habitats to survive climate change impacts;
(B) An alternative that would use presence of an endangered, threatened or candidate species as an exclusion in the screening criteria so that SEZ are not designated on habitat for endangered, threatened or candidate species;
(C) An alternative that constrains the range of technologies that could be used, to promote technologies that minimize water use and environmental footprints;
(D) An alternative that focuses development on private land; and,
(E) A distributed energy alternative.

These five alternatives would promote responsible energy production, would minimize or avoid impacts to sensitive resources, and would protect and enhance the Nation's water, wildlife, and other natural resources. BLM has ignored or unfairly dismissed these alternatives.

3. IMPACTS OF SOLAR ENERGY DEVELOPMENT AND POTENTIAL MITIGATION MEASURES

FLPMA § 201 [43 U.S.C. 1711] (a) requires the Secretary to prepare and maintain on a continuing basis an inventory of all public lands and their resource and other values (including, but not limited to, outdoor recreation and scenic values), giving priority to areas of critical environmental concern. This inventory shall be kept current so as to reflect changes in conditions and to identify new and emerging resource and other values."

Despite this inventory requirement, the BLM states in the DPEIS that for its preferred alternative it was unable to obtain complete geographic information system (GIS) data across the six-state study area and thus could not map the exact footprint of the alternative nor calculate the exact acreage. DPEIS at 2-3. It has compounded this by failing to provide a quantitative analysis

of the cumulative effects of the preferred alternative on listed and candidate species. These obvious, gross deficiencies need to be rectified.

Based on data in Tables 2.2-1 and ES 2-1, the approximate areas by alternative are:

State	Total State	BLM-Administered lands (Acres)		
	Acreage	No Action	Preferred Alternative	SEZ Alternative
Arizona	72,700,000	9,218,009	4,485,944	13,735
California	100,200,000	11,067,366	1,766,543	339,090
Colorado	66,500,000	7,282,061	148,072	21,050
Nevada	70,300,000	40,794,055	*9,084,050	171,265
New Mexico	77,800,000	12,188,361	4,068,324	113,052
Utah	52,700,000	18,182,368	2,028,222	19,192
Total	440,200,000	98,732,220	21,581,154	677,384

*The estimate for Nevada given in Table ES.2-1 is 9,587,828; we do not know which is the BLM's actual estimate.

The scale of the permanent degradation and loss of the public lands and public resources that could result from this PEIS process is unprecedented.

BLM is obligated under FLPMA to "minimize adverse impacts on the natural, environmental, scientific, cultural, and other resources and values (including fish and wildlife habitat) of the public lands involved." 43 U.S.C. §1732(d)(2)(a). Other laws, including the Endangered Species Act, also entail the need for mitigations to minimize impacts. BLM is required to consider measures to mitigate potential environmental consequences in its NEPA analysis. 40 C.F.R. § 1502.16. The NEPA implementing regulations define "Mitigation" to include:

> (a) Avoiding the impact altogether by not taking a certain action or parts of an action.
> (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
> (c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
> (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
> (e) Compensating for the impact by replacing or providing substitute resources or environments.
> [40 C.F.R. §1508.20]

The scale of the degradation and the potential massive loss of public resources will make development of appropriate mitigation measures extremely costly and difficult. All of the mitigation measures outlined in §1508.20 are applicable to various aspects of solar energy development.

In order to minimize adverse impacts, the BLM should drop many of the proposed study areas from further consideration as Solar Energy Zones. The BLM's siting approach, based on

slope, proximity to utility corridors (which invariable pass through valleys and over bajadas) and existing land use designations has effectively resulted in the targeting of desert tortoise habitat in California, Nevada, and Arizona. The BLM's preferred alternative opens 12 percent of "desert tortoise" habitat to solar development. DPEIS at ES-21. That BLM is even willing to entertain opening up 12 percent of the habitat of any listed species is problematic; that fact that this is the BLM's preferred action is simply outrageous. BLM should reconsider its siting criteria to promote avoidance of listed species.

Section 5.10.5.1 Siting and Design must be modified to include a requirement to avoid species habitat that provides important connectivity between populations, and to avoid habitat that provides important corridors for wildlife movement. Without this, the DPEIS will need to undertake an extensive analysis of impacts to habitat connectivity for all special status species.

High quality Mojave Desert shrublands and high quality sagebrush habitats or those that have good restoration potential should not be developed for solar energy in areas where ESA listed or candidate species and other Special Status Species or rare species occur. This applies in particular to desert tortoise, greater sage-grouse, and Gunnison sage-grouse which require landscape level conservation measures to promote recovery.

In order to compensate for the enormous habitat losses, and the additional direct, indirect, and cumulative impacts to sensitive resources caused by the presence of solar power plants and associated infrastructure, the acquisition of off-site compensation lands will be needed and the BLM will need to reduce the multiple impacts of all other consumptive uses authorized by any given land use plan. The BLM should use the PEIS to modify all subject land use plans to allow voluntary buyout of grazing permits. This would then provide a win-win situation for the developers and permittees. Developers could use buyout to offset site-specific impacts from their projects on wildlife, sensitive species, riparian zones, and other resources; permittees who would have their grazing privileges restricted would benefit from the ability to cash out. The ecological benefits of retiring allotments are high and this action may be easier to accomplish than other proposed management solutions. Livestock grazing is a landscape level impact, and the action area for livestock impacts tends to very large with a footprint indicated by the size of the allotment itself. Removing livestock removes direct and indirect impacts at a landscape level as well as reducing impacts on specific, sensitive resources such as riparian areas, cultural sites, and sensitive species and rare plant habitats. Removal of livestock benefits wildlife by removing negative interspecies interactions, reducing competition for forage, and reducing the risk of spread of invasive plants. Combined with the removal of range improvements, this measure would also help reduce the impacts of other threats such as OHV activities and unauthorized route use by eliminating "attractive nuisances", and would reduce subsidized predators such as ravens and coyotes that use those range improvements. It would also reduce trampling impacts to biological crusts and allow allotment lands to reach full potential as carbon sinks, thus helping to offset the loss of carbon sequestration from utility-scale developments. After the initial buyout, it would potentially reduce BLM costs associated with rangeland management and administration.

A combination of both acquisition of compensation lands and an overall reduction of impacts will be required to achieve a net decrease in cumulative impacts to sensitive and listed species to offset the habitat loss and other impacts,.

In addition, the Mojave Desert acts as a carbon dioxide sink on a par with grasslands and temperate forests.[1] In order to assure a net climate change benefit, the BLM should require that all solar energy projects demonstrate a clear net carbon dioxide reduction benefit. The loss of the project sites carbon dioxide sink capability should be factored into the mitigation calculations. Any requirement for the operation of gas-powered or other fossil fuel power plants to accommodate loads etc should also be factored into the calculation.

The BLM should clearly adopt a policy of "no net loss" of public lands whereby an equivalent acreage of private lands and inholdings are acquired by project developers and these compensation lands are conserved in perpetuity. Habitat quality of compensation habitat must be of an equal or better quality than the habitat lost to solar projects. This would protect and mitigate for impacts for common desert flora and fauna, and would be in addition to any habitat acquisition required to offset impacts to special status species.

4. IMPACTS AND CUMULATIVE EFFECTS

The National Environmental Policy Act ("NEPA") requires agencies to take a "hard look" at the potential environmental impacts of its proposed actions. The PEIS must fully consider the direct, indirect and cumulative effects of the proposed policy and actions. Further, NEPA directs agencies to "rigorously explore and objectively evaluate all reasonable alternatives" [40 C.F.R. 1502.14] A consideration of alternatives that lead to similar results is not sufficient to meet the intent of NEPA. The PEIS must address all substantial questions raised by the public. The PEIS should present the environmental impacts of the proposal and the alternatives in comparative form based on the information and analysis presented in the sections on the Affected Environment (40 C.F.R. § 1502.15) and the Environmental Consequences (40 C.F.R. § 1502.16). This more sharply defines the issues, provides a clear basis for choice among options by the decisionmaker and the public, and ensures that the choice not be arbitrary and capricious.

Emissions and Climate Change Effects

The DPEIS repeatedly states or implies that the use of solar facilities to generate electricity "would displace air emissions that would otherwise be released from fossil fuel-fired power plants." DPEIS at 8.1-163. There is no support in the DPEIS or elsewhere for this statement; the solar power plants proposed in the preferred alternative are apparently *in addition to*, not *in lieu of*, fossil fuel energy generation. Nowhere does the DPEIS discuss the fossil fuel-fired power plants that will be displaced by the construction of the proposed industrialized, decentralized solar power plants proposed here. Even if solar power plants were to displace coal fired plants, additional power generation or extensive storage facilities would be needed to offset

[1] Wohlfahrt, G., Fenstermaker, L. F. and Arnone, J. A. III. 2008. Large annual net ecosystem CO2 uptake of a Mojave Desert ecosystem. Global Change Biology. 14(7): 1475-1487.

the imbalance between solar electric generation which is sunlight dependent and actual demand for power. The DPEIS does not explain how many new fossil-fuel power plants (and their emissions output) will be needed to ensure continuity of energy generation to match consumption.

Effects on Wildlife and Special Status Species

The DPEIS does not take the requisite hard look at impacts to the wildlife, vegetation, and threatened and endangered species in the massive action area for the preferred alternative. This is a major omission that merits recirculation of the DPEIS.

DESERT TORTOISE

The BLM's preferred alternative opens 12 percent of "desert tortoise" habitat to solar development. DPEIS at ES-21. First, this statement does not distinguish between the listed *Mojave* desert tortoise population and the candidate *Sonoran* desert tortoise. Second, this habitat consists largely of the essential matrix habit that connects desert tortoise populations and conservation areas. Third, this habitat includes peripheral desert tortoise populations that may be important in the species' response to climate change. Thus decisions made in this PEIS process could have highly significant consequences for both these taxa. Despite the requirements to do so, the PEIS does not provide quantitative estimates of the size of the impacted population. This is particularly problematic given the BLM's recent need to re-initiate consultation with te USFWS over impacts to desert tortoise at the Ivanpah Solar Electric Generating System project where it seriously underestimated the number of affected tortoises.

Mojave desert tortoises, listed as threatened under the ESA, occur in the affected areas of the following 8 SEZs: Amargosa Valley, Delamar Valley, Dry Lake, Dry Lake Valley North, East Mormon Mountain, Iron Mountain, Pisgah, and Riverside East. Sonoran desert tortoises, candidate species for ESA listing, may occur in the affected areas of the following 3 SEZs: Brenda, Bullard Wash, and Gillespie. These SEZ will directly impact desert tortoises in at least four of the six Recovery Units identified in the 1994 Recovery Plan[2], and may seriously compromise connectivity and gene flow between the Evolutionarily Significant Units of desert tortoise that occupy them.

The BLM needs to analyze the cumulative effects of development on desert tortoise for each alternative. It needs to determine the affected population size, fully analyze the cumulative effects of fragmentation, and fully analyze the impacts to connectivity between desert tortoise genetic units and between desert tortoise conservation areas. Unless additional safeguards are built in, we do not see how the USFWS will be able to avoid issuing a jeopardy finding over impacts to desert tortoise.

GOLDEN EAGLE

[2] Fish and Wildlife Service. 1994. Desert Tortoise (Mojave Population) Recovery Plan. U.S. Fish and Wildlife Service, Portland, Oregon. 73 pages plus appendices.

Golden eagle (*Aquila chrysaetos*) is a fully protected species under The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c). The USFWS currently does not issue "take" permits for this species because the species is declining. Loss of foraging habitat that results in a decrease in productivity or nest abandonment is considered "take". The DPEIS recognizes that golden eagles use many of the solar power development areas including most of the proposed SEZ as foraging areas.

McCrary et al. 1986[3] studied a small, prototype thermosolar facility. They found that bird mortality occurred through collisions with structures such heliostats and from burning when birds flew through points where energy was focused from the heliostats. They cautioned that "Since Solar One is only a 10 megawatt pilot facility, future project designed to produce hundreds of megawatts will require several thousand heliostats and much taller receiver towers. The greater magnitude of these facilities may produce non-linear increases in the rate of avian mortality when compared to Solar One and extrapolations from this study should be made with caution. The removal of large tracts of desert from biological production for solar power generation and the ecological effects caused thereby should also be of concern." Given the large areas that may be developed, the range of technologies, and the existing database we believe that there is ample information regarding the potential risk to golden eagles, and believe that this program will take golden eagles. BLM should propose avoidance of any take by restricting the areas open to development and by restricting the technologies used to those that do not require structures that may place eagles at risk.

GREATER SAGE-GROUSE & GUNNISON'S SAGE-GROUSE

High quality sagebrush habitats or those that have good restoration potential should not be developed for solar energy in areas where greater sage-grouse and Gunnison sage-grouse occur because these species require landscape level conservation measures to promote their recovery. The cumulative effects analysis does not quantify the impacts to the species populations, nor does it provide a quantitative analysis of the cumulative effect of the transmission lines and fences, and access roads that will be engender by each alternative. These deficits must be addressed.

FISH & AQUATIC SPECIES

Many aquatic species will be affected or may be affected by water drawdown and by water use. However, there is no analysis of the cumulative impacts of water use on fish and wildlife and their habitats within each SEZ.

Livestock Grazing

The DPEIS proposes "Wherever there are reductions in grazing use, opportunities for mitigating this loss through changes in livestock management or installation of range improvements should be considered." DPEIS at 5-12. There is no analysis of the cumulative effects of this proposal on sensitive resources including wildlife.

[3] McCrary, M. D., McKernan, R. L., Schreiber, R. W., Wagner ,W. D. and Sciarrotta, T. C. 1986. Avian Mortality at a Solar Energy Power Plant. Journal of Field Ornithology. 57(2): 135- 141.

Water Resources

Water is one of the most precious desert resources, and maintaining surface waters and flows, and ground water supplies is essential for conserving desert ecosystem function. Developing large tracts of land for solar power plants impact surface waters and groundwater. Many of the desert basins are already in a serious water overdraft situation and the entire western United States is facing serious water shortages under all climate change scenarios. It is critical that the BLM ensures that solar development does not allow unacceptable impacts to both the quantity and quality of water resources and the ecosystems, habitat and species that depend on them. The BLM should require that any water needs for authorized power plants be completely offset by reductions in other uses within the basin.

The DPEIS analysis of the risks of hydrological disruption posed by large-scale power plants is inadequate. The DPEIS should include uniform mitigation and monitoring measures for the ephemeral washes on the public lands. The ecological condition of these washes is extremely important for multiple reasons, including the hydrologic health of the watershed (infiltration, erosion, downstream water quality), biodiversity (migratory corridors and habitats), and vegetation (the majority of vegetation occurs alongside of these supplemental water sources). In some states, such as California, state agencies assert jurisdiction and require mitigation for impacts to ephemerals streambeds. However, this is not true in Arizona. The BLM must require full mitigation in the form of purchase of replacement ephemeral streambed habitat.

5. CALIFORNIA PROPOSED SOLAR ENERGY ZONES

California gets the lion's share of the acreage of the proposed solar study areas. The maps depict four study areas within the FLPMA designated California Desert Conservation Area: Imperial East (12,830 acres), Iron Mountain (109,642 acres), Pisgah (26,282 acres), and Riverside East (202,295 acres). The maps also depict vast tracts of land sweeping across the Mojave and Colorado Deserts that are lands being considered open development in the DPEIS preferred alternative.

Development of these four solar study areas would result in a massive loss of habitat, major fragmentation of entire desert ecosystems and loss of connectivity. This is clearly incompatible with the purpose of the California Desert Conservation Area espoused in FLPMA, which is "to provide for the immediate and future protection and administration of the public lands in the California desert within the framework of a program of multiple use and sustained yield, and the maintenance of environmental quality". Contrary to the BLM's goal of facilitating siting of solar power plants, the proposed SEZ themselves are located in relatively resource rich locations. This makes them both controversial and inappropriate.

There is a considerable amount of solar energy power plant development already underway in California with 19,100 MW on public lands within the CDCA alone, and the goal of 10,000 MW mentioned in the Energy Policy Act and Secretarial orders has clearly been exceeded. Given the large amount of public land which is already slated for development for

solar power plants in California, the BLM should readdress its purpose and need, and reconsider the need for locating any Solar Energy Zones in the state.

Comments Specific to the Proposed Imperial East SEZ (California)

The proposed Imperial East SEZ includes 5,722 acres of public land. It is located in Imperial County in southeastern California, near the United States–Mexico border between I-8 and State Route 98, and just north of the All-American Canal.

We do not support the designation of the Imperial SEZ. There are multiple conflicts with cultural resources and wildlife and habitat resources associated with this proposed SEZ. It is located immediately east of a cultural ACEC (Lake Cahuilla – C) and immediately southwest of East Mesa ACEC.

Existing transmission lines in the area are inadequate to deal with the assumed output and "upgrades of existing transmission lines would be required to bring electricity from the proposed Imperial East SEZ to load centers; however, at this time the location and size of such new transmission facilities are unknown." DPEIS at 9.1-3.

Cultural Resources: The Imperial East SEZ lies between Lake Cahuilla cultural ACECs C and D and is an area rich in important cultural resources. According to the DPEIS, "One archaeological survey has been conducted within the Imperial East SEZ in the northwest corner of the SEZ." The size of this surveyed area is not provided but appears cover only a small proportion of the SEZ. The DPEIS recognizes that Lake Cahuilla ACECs C and D could be exposed to additional human traffic, resulting in an increased risk of loss of prehistoric resources. DPES at 9.1-6. The Specific Design Feature to deal with this issue is: "Once construction of solar energy facilities begins, the BLM would monitor to determine whether increases in traffic in the ACECs occurs and whether additional management measures are required to protect the resources in these areas." This is inadequate since it only monitors for impacts. The emphasis should be on avoidance. The BLM should survey the entire SEZ for cultural significance prior to making any decision to designate this SEZ. It should establish clear measures to avoid any impacts to the adjacent and nearby ACECs.

Yuma Clapper Rail: The proposed Imperial East SEZ is immediately north of a "wetland" mitigation north of the All American Canal area that provides a nesting location for the endangered Yuma clapper rail (CNDDB occurrence 17). The proposed SEZ includes 44 acres of potentially suitable habitat for the species. The Yuma clapper rail is a California fully protected species. This means that state agencies cannot issue take permits for the species. The SEZ area boundary should be altered to exclude actual and potential Yuma clapper rail habitat and to provide an appropriate buffer to eliminate potential impacts on the local hydrology.

Flat-tailed Horned Lizard: The proposed Imperial East SEZ includes significant amounts of occupied flat-tailed horned lizard habitat. The proposed SEZ falls within the BLM's designated East Mesa Flat-tailed Horned Lizard Wildlife Habitat Management Area and is adjacent to the East Mesa ACEC. The DPEIS estimates that development of this SEZ will have indirect impacts on 9.0% of available potentially suitable habitat in the region. DPEIS at 9.1-133.

The USFWS's recent decision to withdraw its proposed listing decision for the Flat-tailed horned lizard relied in part on the assumption that "the overall acreage of potential impacts from development of energy facilities is likely to be small compared to the total range of the species". FWS 2011[4] at 14228. Designation and development of this SEZ will clearly jeopardize this USFWS assumption. The proposed Imperial East SEZ boundaries should be reconfigured to avoid impacts to the flat-tailed horned lizard or the proposed SEZ should be abandoned.

Bighorn Sheep: The proposed Imperial East SEZ includes bighorn sheep habitat. According to the DPEIS (at 9.1-105), "Because it is a BLM sensitive species, the desert bighorn sheep is discussed in Section 9.1.12." However, there is no mention of bighorn sheep in section 9.1.12 let alone any discussion. Nor are bighorn sheep discussed anywhere else in the proposed Imperial East SEZ write-up with the exception of a mention in the cumulative effects section (DPEIS at 9.1-287) that projects may block bighorn sheep dispersal corridors. This inadequacy needs to be rectified.

Golden Eagle: The DPEIS recognizes that the fully protected golden eagle (*Aquila chrysaetos*) may forage on the proposed Imperial East SEZ. The USFWS currently does not issue "take" permits for this species because the species is declining. Loss of foraging habitat that results in a decrease in productivity or nest abandonment is considered "take". Required upgrades to existing transmission lines may exacerbate the risks of take.

Because there are multiple conflicts with cultural resources and wildlife and habitat resources associated with this proposed SEZ, BLM should withdraw the proposed Imperial East SEZ from further consideration.

Comments Specific to the Proposed Iron Mountain SEZ (California)

The proposed Iron Mountain SEZ includes 106,522 acres of public land. It is located in San Bernardino County in southeastern California in Ward Valley between an ACEC, the Chemehuevi Desert Wildlife Management Area (DWMA), and state highway 62.

We do not support the designation of the Iron Mountain SEZ. There are multiple conflicts with wildlife and habitat resources associated with this proposed SEZ. It is located immediately south of the Chemehuevi DWMA and provides patches of desert tortoise habitat that provide the connectivity between the Northern and Eastern Colorado Desert Tortoise Recovery Units. It is also habitat for several rare plants including multiple occurrences of Harwood's eriastrum and Harwood's milkvetch. Large-scale clearance and engineering construction within this site will severely disrupt essential hydrological processes.

The proposed SEZ includes the southern swathe of Ward Valley, well known to the public from the long-running controversy over the nuclear waste facility that was once proposed there. Northern Colorado Recovery Unit desert tortoise populations, bighorn sheep, raptors, hepatic tanager, rare plants including Harwood's eriastrum, and important cultural resources would be directly and indirectly impacted by any power plant projects in this area.

[4] FWS. 2011. Endangered and Threatened Wildlife and Plants; Withdrawal of Proposed Rule To List the Flat-Tailed Horned Lizard as Threatened. Federal Register. 76(50): 14210- 14268. Tuesday, March 15, 2011.

The proposed Iron Mountain SEZ overlies the Chocolate Mountains - Turtle Mountains - Ward Valley connectivity area, an essential habitat connectivity linkage which provides habitat for species occupation and movement between ecotypes in the region (Spencer *et al*., 2010). It provides important connectivity and linkage matrix for the desert tortoise, bighorn sheep and other species.

Since designation of the proposed Iron Mountain SEZ is opposed by many state agencies including the California Energy Commission we do not understand why the BLM has continued to waste public resources and not dropped the proposed SEZ from further study. Because there are multiple conflicts with cultural resources and wildlife and habitat resources associated with this proposed SEZ, BLM should immediately withdraw the proposed Iron Mountain SEZ from further consideration.

Comments Specific to the Proposed Pisgah SEZ (California)

The proposed Pisgah SEZ includes 23,950 acres of public land. It is located in San Bernardino County in southeastern California, about 100 mi (160 km) northeast of Los Angeles. The proposed Pisgah SEZ would be sandwiched between two ACECs, the Ord-Rodman DWMA to the west and the Pisgah ACEC to the east, and the Cady Wilderness Study Area to the north.

We oppose the designation of the proposed Pisgah SEZ. This is a resource rich area and there are multiple resource conflicts which make this area highly unsuitable as a SEZ. Desert tortoise, bighorn sheep, Mojave fringe-toed lizard, raptors, rare plants including white-margined beardtongue, small flowered androstephium and Emory's crucifixion-thorn, other sensitive species and cultural resources would be directly and indirectly impacted by utility-scale projects. A recent study has cautioned identification of this area because of multiple impacts to desert tortoise and bighorn sheep movement.[5] The SEZ is adjacent to known pockets of high desert tortoise density, and this area provides the only connectivity between tortoises in the Southern Mojave and Central Mojave populations as identified by Murphy et al, 2007[6], and it will impact connectivity between the West Mojave Recovery Unit and the eastern desert tortoise recovery units. The site is immediately adjacent to two ACECs and a Wilderness Study area, and includes part of the Pisgah Lava Flow Research Natural Area. Large-scale clearance and engineering construction within this site will severely disrupt essential hydrological processes. For all these reason, this sensitive and significant area should be removed from further consideration as a Solar Energy Zone.

Because there are multiple conflicts with cultural resources and wildlife and habitat resources associated with this proposed SEZ, BLM should immediately withdraw the proposed Pisgah SEZ from further consideration.

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[5] Bare, L., Bernhardt, T., Chu, T., Gomez, M., Noddings, C. and Viljoen, M. 2009. Cumulative Impacts of Large-scale Renewable Energy Development in the West Mojave. Effects on habitat quality, physical movement of species, and gene flow. Masters Thesis. University of California, Santa Barbara. 144 pp. *Available at*: http://fiesta.bren.ucsb.edu/~westmojave/images/Wemo_Final.pdf

[6] Murphy, R. W., Berry, K. H., Edwards, T. and Mcluckie, A. M. 2007. A Genetic Assessment of the Recovery Units for the Mojave Population of the Desert Tortoise, *Gopherus agassizii*. Chelonian Conservation and Biology 6(2): 229–251.

Comments Specific to the Proposed Riverside East SEZ (California)

The proposed Riverside East SEZ is the largest of the proposed SEZs in the six-state study area, with a total area of 202,896 acres. It sprawls along Interstate 10 from the Joshua Tree National Park/Desert Center area to Blythe, California.

There are multiple resource conflicts at this site in part because the study site is extremely large and ranges across the heart of California's Colorado Desert region.

We oppose the designation of the proposed Riverside East SEZ. The northeastern portion includes extensive occupied desert tortoise habitat. The entire polygon effectively divides the Northern Colorado Desert Tortoise Recovery Unit from the Eastern Colorado Desert Tortoise Recovery Unit, and development thus threatens to sever connectivity entirely. The proposed study area also includes bighorn sheep, raptor, and sensitive bat habitats, and would impact many rare plant species including Coachella valley milkvetch, jackass clover at Palen Lake, and Harwood's milkvetch. There are important cultural sites particularly those associated with the dry lakes. The polygon also includes Ford Dry Lake and development would impact off-road vehicle use. A number of ACECs are entirely surrounded and isolated by the proposed SEZ. Large-scale clearance and engineering construction within this site will severely disrupt essential hydrological processes.

Because there are multiple resource conflicts with this sprawling proposed SEZ, the BLM should remove this area from further consideration as a Solar Energy Zone.

6. ARIZONA PROPOSED SOLAR ENERGY ZONES

The BLM's preferred alternative opens 7,009 square miles of land in Arizona to solar development, an area 326 times the size of the SEZ-designated lands. DPEIS at ES-6, Table ES.2-1. No other state has such a large percentage of total BLM acres open to solar development as Arizona under the preferred alternative (49 percent), nor such a great disparity between the SEZ alternative and the preferred alternative.

The BLM anticipates that 214,000 acres will be developed within the next 20 years under the reasonably foreseeable development scenario (RFDS). DPEIS at ES-14. This is well within the SEZ acreage of 677,384 acres. DPEIS at ES-6, Table ES.2-1. It is therefore entirely unclear why the BLM's preferred alternative entails opening over ten times the amount of land necessary for solar development under its own projections; the ratio of land under the SEZ alternative meets the criteria the BLM specifies for the preferred alternative, that is "adequate amounts of land available to support the level of development projected in the RFDS and would provide a great deal of flexibility in siting both solar energy facilities and associated transmission infrastructure." DPEIS at ES-29. There is no justification as to why the BLM needs to designate so many acres as open to power plant development.

The SEZ-specific design features for the Arizona SEZs include the development of additional range infrastructure and changes to grazing management to mitigate the loss of AUM that may be associated with the solar developments. Range "improvements"/developments need a separate NEPA process to ensure against adverse effects.

We are concerned with the estimated fresh surface water and groundwater use the solar developments would entail. Arizona is facing serious water shortages under all climate change scenarios, including a tenuous allocation from the Colorado River. Allocating potable water for solar development, either through allowing surface water transfers or groundwater pumping, is giving away precious public trust resources for private development. We do not believe that the DPEIS does an accurate or thorough analysis of the risks of hydrological disruption the proposed action poses to Arizona's public lands. The threats of drawdown are too easily dismissed in the DPEIS. See, for example, DPEIS at 8.1-62. Overdraft in the Brenda SEZ groundwater basin has already caused substantial ecological and geologic impacts from subsidence. If the BLM were proposing to allow solar development on existing in-holdings, urban-adjacent lands, or other areas that might already have infrastructural support for it, the agency could be requiring the use of non-potable water (effluent) in the generation of these "renewable" energy supplies. Given the slow rate of aquifer recharge, we don't believe that the current proposals are truly "renewable."

The DPEIS should be amended to reflect the current status of the Sonoran desert tortoise which is a candidate species for listing. 75 FR 78094-78146, December 14, 2010. The USFWS specifically identified the disturbance anticipated by the Sterling Solar Generating Facility, a solar development not included in the DPEIS and apparently not considered in the reasonable foreseeable development scenario on the Black Mountains desert tortoise population. The USFWS determination that the Sonoran desert tortoise warranted listing discussed the threats from new transmission lines and roads from solar development. The FWS makes plain that solar developments, combined with other threats in the species habitat, makes Sonoran desert tortoise eligible for endangered species status. In the finding, the agency acknowledges that new threats may elevate the species for full ESA protection. We believe that if the BLM goes forward with the locations listed in the DPEIS for Arizona, this alone may compel full listing of this taxon.

The BLM relies up the implementation of programmatic design features to reduce impacts to special status species and, presumably, finds these suitable reductions in the threat to Sonoran desert tortoise as well. However, desert tortoise is a highly mobile species, known to move across large distances and between mountain ranges. *See* Connor and Rosmarino, 2008. Thus, even if the solar installations are not directly on top of tortoise burrows, the impacts within the habitats of this species cannot be dismissed.

While the DPEIS minimizes the scale of the impacts to the Sonoran desert tortoise by isolating the acreage at each SEZ, it is important to acknowledge the range-wide threats this species faces, including the cumulative effects of solar development at other SEZs and on other solar project sites. Where the BLM discusses compensatory mitigation by improving habitats on acquired lands, we propose the agency consider retiring grazing allotments and reducing this known adverse effect in tortoise habitat.

The DPEIS does not include mitigation or monitoring measures for the ephemeral washes on the public lands proposed for development. The ecological condition of these washes is extremely important for multiple reasons, including the hydrologic health of the watershed (infiltration, erosion, downstream water quality), biodiversity (migratory corridors and habitats), and vegetation (the majority of vegetation occurs alongside of these supplemental water sources). Because the Arizona BLM does not measure or monitor rangeland health attributes in washes, the downstream impacts of the SEZ developments will go unquantified and unmitigated. The BLM must simultaneously develop land health standards and practices that will capture any consequences of the solar developments, with baseline data on the ephemeral wash environment collected before any development takes place. See, for example, the wetlands on the Bullard Wash SEZ; the ecological health of these important habitats would not be monitored under any existing monitoring protocols employed by the BLM. DPEIS at 8.2-68.

Comments Specific to the Proposed Brenda SEZ (Arizona)

The SEZ-specific design features for the Brenda SEZ in Arizona include the development of additional range infrastructure and changes to grazing management to mitigate the loss of AUM on the Crowder-Weisser allotment. DPEIS at 8.1-5. As we suggested in our earlier comments, the BLM should have considered simply allowing for relinquishment of those AUM as well. This is especially pertinent because the Crowder-Weisser allotment provides habitat for the Sonoran desert tortoise, a species that would be adversely affected by additional range developments and grazing concentration areas. By range "improvements," the agency usually means additional water supplies, a cumulative impact that the DPEIS fails to analyze at this SEZ location. DPEIS at 8.1-7.

The DPEIS hints at potential compensatory mechanisms to balance acreage of habitat loss but does not commit to a mitigation program for the solar proposal. DPEIS at 8.1-148. It suggests improving the carrying capacity for tortoise on acquired lands or enhancing tortoise habitat on federal land, but it does not commit to any clear course of action to do so. The proposed action should have specific offsets and actions identified if the BLM expects the public to have any faith in these mitigation measures. For example, the BLM could have used the PEIS to modify all land use plans to allow voluntary buyout of grazing permits

The DPEIS posits a reduction in 315 AUM from the Crowder-Weisser allotment due to the footprint of the Brenda SEZ. DPEIS at 8.1-29. The DPEIS discusses absorption of the AUM on other parts of the vast acreage associated with this allotment. The DPEIS should acknowledge, and the BLM should clarify, that earlier assessments of the rangeland health of this allotment have specifically indicated, "The public lands [of the allotment] do not regularly produce sufficient amounts of forages to sustain a consistent livestock grazing program throughout the allotment." Crowder-Weisser Standards and Guidelines Assessment. The active use on the allotment has been substantially lower than the permitted use for this reason. Therefore, the proposed action should be to simply eliminate the acreage associated with the solar development and adjust the AUM on the permit to the actual forage remaining on the allotment.

We're concerned about the "should" statements in the SEZ-specific design features tables (e.g. "Bouse Wash should be avoided… Tyson Wash should be spanned by the transmission line," DPEIS at 8.1-9). Because these are supposed to be mitigation measures for reducing the impact of solar development on wildlife resources, the DPEIS must use imperative language ("will" and "shall") to make these hard and fast commitments. Without this, the mitigation measures promised in the DPEIS are merely suggested remedies and the contingent effects analysis is meaningless.

We note that the DPEIS only assesses the impact of the acoustic environment on the human communities surrounding the Brenda SEZ. DPEIS at 8.1-14. It does not consider the acoustic impacts of the proposed developments on the native and migratory wildlife species of the region, an oversight that must be remedied before the final EIS. The sonic considerations are not even addressed in the species-specific analysis later in the chapter. See, for example, DPEIS 8.1-152.

In our scoping comments, we specifically raised the issue of invasive species infestation in the Brenda SEZ. The DPEIS does not respond specifically, but generally describes, "Noxious weeds could become established." DPEIS at 8.1-8. This ignores the site-specific information that problematic invasive weeds are already there. The DPEIS reports that no noxious weeds are present on the Brenda SEZ (DPEIS at 8.1-72) but does not consider whether weeds are nonetheless present, including *Brassica tournefortii*, a highly flammable and invasive pest plant. Moreover, while BLM does not report these species being on the proposed SEZ in August 2009, it does not describe whether they are present on the proposed transmission line footprint or within the cumulative impact area.

The DPEIS claims that there are no ground-disturbing activities associated with the project developments within the area of indirect effects. DPEIS at 8.1-146. This disregards the effects of hazardous waste spills travelling through the soil, affecting biological soil components, reductions to soil integrity and stability.

Section 8.1.11 of the DPEIS describes the impacts to wildlife and aquatic biota that could occur with the potentially affected area of the proposed Brenda SEZ. DPEIS at 8.1-79. We find it remarkable that the same justification is provided for nearly every species that the BLM considers: "Small overall impact." The reality is, cumulatively, the impact will be profound within the area that the SEZ is located, likely the complete obliteration of suitable habitat for many dozens of species and hundreds of individuals. The DPEIS should not minimize but rather disclose the extent and intensity of the proposal.

It is not clear from the DPEIS whether the BLM has considered the cumulative impacts of the Brenda SEZ in context of the "Quartzsite Solar Energy Project" in La Paz County, Arizona. The Quartzsite project was scoped in January 2010, and it is also located on a section of the Crowder-Weisser allotment very near to the proposed SEZ. The potential for this additional (and undescribed in the DPEIS) development in the same area is a present and reasonably foreseeable future action that should have been analyzed and disclosed. The Quartzsite project is likely to have serious visual impacts (given the extent of proposed infrastructure) and cumulative effects on wildlife species in the area.

Comments Specific to the Proposed Bullard Wash SEZ (Arizona)

The Bullard Wash SEZ is in a remote desert area, with the nearest major road approximately 5 miles away to the south and the nearest transmission line 5 miles to the north of the SEZ. DPEIS at 8.2-1. The extent to which this area has already been impacted by human activities is unspecified, but its remoteness and inaccessibility make it an inappropriate site for new, industrial development. The BLM should have considered lands that are already along roadway corridors or transmission lines in order to minimize the footprint of the solar development.

The Bullard Wash SEZ is situated in an area recognized for its remoteness and inaccessibility, as signified by the high number of Wilderness Areas and Areas of Critical Environmental Concern in the surrounding public lands. DPEIS at 8.219. The experience of visitors to these places and the integrity of the habitats for non-human species reflect the lack of industrialized landscapes, exactly the opposite of what the BLM is now proposing. The BLM must commit to limiting types of solar development at this SEZ to those which would not impact the viewshed. DPEIS at 8.2-21. Moreover, the experience of Wilderness is not only visual, but a feeling of solitude that cannot be calculated in spatial analysis. BLM has not conducted a social assessment to determine these impacts to human experience of the natural environment.

We note that the DPEIS only assesses the impact of the acoustic environment on the human communities surrounding the Bullard Wash SEZ. DPEIS at 8.2-14. This does not consider the acoustic impacts of the proposed developments on the native and migratory wildlife species of the region, an oversight that must be remedied before the final EIS. The sonic considerations are not even addressed in the species-specific analysis later in the chapter.

The Bullard Wash SEZ occurs on three perennial/ephemeral grazing allotments. DPEIS at 8.2-27. Similar to the Brenda SEZ, the BLM cannot posit a ratio-based reduction in AUM on these allotments scaled to acreage lost; desert vegetation is extremely patchy and a new "carrying capacity" estimate would need to be done before grazing is reauthorized on the newly-demarcated boundaries of each allotment. Where the DPEIS says, "Quantification of the impact on the grazing permittees would require a specific analysis..." (DPEIS at 8.2-28) it should more appropriately read, "A new EIS will be completed to determine a range of alternatives for the downsized allotments."

The calculations of the impacts to groundwater inflows from the Bullard Creek SEZ's groundwater basin from solar development are an issue not just for the geological stability of the area (subsidence), but because the contribution of groundwater to the nearby surface waters of the Havasu Lake and Bill Williams river also relates to the extent of riparian habitat available for imperiled species. The DPEIS does not address these "downstream" impacts of the proposed solar development. DPEIS at 8.2-64. Stating that withdrawals "should" be limited to prevent impacts to riparian areas is insufficient protection for these special habitats. DPEIS at 8.2-80.

Comments Specific to the Proposed Gillespie SEZ (Arizona)

The Gillespie SEZ is described in the PEIS as "undeveloped and rural" and "undeveloped scrubland characteristic of a semiarid desert valley." DPEIS at 8.3-1. The proposed action would completely change the description of this landscape, converting the undeveloped character to an industrialized power generation station, permanently stripping these lands of their rural and desert valley character.

We note that the map included in the DPEIS does not address the designation of the nearby BLM lands. DPEIS at 8.3-2. The lands to the east to the east of the SEZ are within the Sonoran Desert National Monument, a place so special and remarkable that it was so designated in 2001. The proclamation describes this area as having "an extraordinary array of biological, scientific, and historic resources. The most biologically diverse of the North American deserts…. excellent habitat for a wide range of wildlife species." Surely, the BLM does not expect the public to believe those values stop at the arbitrary boundaries of the monument? The Gillespie SEZ and the surrounding public lands are equally important to the ecological integrity of the region.

The DPEIS discusses mitigating the loss of 14.6 percent reduction in future ephemeral grazing authorizations in the Layton allotment as a result of development in the Gillespie SEZ. Table 8.3.1.3-1. It is unclear how the BLM determined this reduction; carrying capacity is not arbitrarily determined by acreage, but should be based on actual available resources. DPEIS at 8.3-30. This description also fails to correspond with descriptions later in the document that admit the Gillespie SEZ would affect four grazing allotments. DPEIS at 8.3-29.

It is similarly unclear why the BLM believes that it would be appropriate to mitigate impacts to grazing allotments with additional range developments. Range developments have profound impacts of vegetation, soils, and invasive species. We suggested, and BLM has ignored, that the agency facilitate the retiring of grazing allotments as a mitigation measure instead of increasing livestock impacts on the remaining, undeveloped lands.

The amount of water being discussed in the DPEIS is enormous. Table 8.3.1.3-1. The availability of this water has not been demonstrated. DPEIS at 8.3-56. Water availability in Arizona is extremely uncertain, and the idea that Arizona will give up a share of its precious water to produce electricity for export to California and the west-wide grid is highly speculative. The DPEIS fails to account for these transfers or substantiate its claims about available water resources in the Phoenix AMA.

Impacts to the riparian areas dependent on the same aquifer should be considered more thoroughly than the DPEIS currently considered them. The admissions in the cultural resources section of Table 8.3.1.3-1 are striking: "Development in the proposed SEZ would eliminate some traditionally important plants and some habitat of traditionally important animal species." This conflicts with statements elsewhere in the DPEIS that downplay the significance of the effects on habitat.

It is clear from the map in Figure 8.3.3.1-1 that the areas being considered by the BLM for solar development would completely fragment and isolate the specially-reserved areas on BLM lands. The continuity and connectivity benefits of adjacent Wilderness, monuments, and

special resource management areas would be utterly undone by opening all the other BLM lands in the region. With industrialized solar development in the interstices, the value of the habits at each otherwise protected area is diminished. The preferred alternative would have isolating consequences for wildlife populations.

The statements in the DPEIS regarding the decommissioning and reclamation of the solar site are entirely unrealistic. The DPEIS states that the site would be reclaimed it its preconstruction state. 8.3-61. One only need to watch this video (http://www.youtube.com/watch?feature=player_embedded&v=5BGRD21H07Y) to understand how impossible it will be to ever restore the Sonoran desert to pre-industrialized state. (The video is taken in California at the BrightSource Energy development on BLM land.) The unlikelihood that this site can ever be "reclaimed" (and we note that BLM is using the language of the 1872 Mining Act rather than the contemporary "restoration") is demonstrated by the inclusion of precipitation data later in the DPEIS. DPEIS at 8.3-65. The area averages 7.6 inches of rain annually. Id. Perennial vegetation in this desert is slow-growing and would take centuries to re-colonize the development site. This realistic time-frame should be made more explicit in the DPEIS. Statements such as "Re-establishment of desert scrub communities in temporarily disturbed areas would likely be very difficult and might require extended periods of time," (DPEIS at 8.3-73) are misleading because the use of the descriptor "temporary" is inaccurate and the "extended periods of time" is vague. This is a permanent and wholesale destruction of native vegetation that will take centuries, if ever, to restore.

7. NEVADA PROPOSED SOLAR ENERGY ZONES

Seven SEZ have been proposed in Nevada: Amargosa Valley (32,699 acres), Dry Lake (16,516 acres), Delamar Valley (17,932 acres), Dry Lake Valley North (49,775 acres), East Mormon Mountain (7,418 acres), Gold Point (5,830 acres), and Miller's (19,205 acres).

Four of these SEZ (Amargosa Valley, Dry Lake, Delamar Valley and, East Mormon Mountain) are in desert tortoise habitat.

Six of the seven SEZ are located within BLM grazing allotments: Millers (Monte Cristo Allotment), Gold Point (Magruder Mountain Allotment), Dry Lake (Dry Lake Allotment) Mormon Mountain (Gourd Springs and Summit Springs allotments), Dry Lake Valley (Wilson Springs, Simpson and Ely allotments), and Delamar (Buckhorn and Oak Springs allotments.

Three of the SEZ (Amargosa Valley, Dry Lake Valley North, and Delamar Valley) are situated in regions of the state with very limited ground and surface waters. These water-related issues make these areas unsuitable for further consideration.

Comments Specific to the Proposed Amargosa Valley SEZ (Nevada)

The proposed 31,625 acre Amargosa Valley SEZ is located in Nye County in southern Nevada near the California border. The proposed Amargosa Valley site lies between Death

Valley National Park and Ash Meadows National Wildlife Refuge and is part of the Death Valley regional groundwater flow system.

The 23,000 acre Ash Meadows National Wildlife Refuge provides habitat for 12 species listed under the Endangered Species Act. The refuge was established specifically to protect these threatened and endangered species. Most of the listed species are dependent on aquatic or wetland environments within the refuge. The refuge also includes the National Park Service administered Devil's Hole, the only known habitat for the Devil's Hole pupfish. On November 4, 2008, the Nevada State Engineer issued Order 1197 announcing that new applications to appropriate additional water from the Amargosa Desert basin within 25 miles of Devil's Hole would be denied due to concern over the effect of groundwater pumping on the water level in Devil's Hole. Based on the above, the Amargosa Valley study area should be eliminated from further consideration as a Solar Energy Zone.

The desert tortoise section does not discuss important information relevant to the analysis of impacts. The desert tortoise population in the local area (Amargosa Desert/Pahrump Valley) can be genetically delineated from other desert tortoise populations in Nevada, yet none of the established Nevada desert tortoise ACECs adequately conserves this population (Britten *et al*., 1997[7]). The genetic lineation of the "Amargosa" desert tortoise sub-type has been confirmed and refined by Haggerty, 2008[8].

The Amargosa desert tortoise subtype is also of scientific interest since it occupies the northern end of the species range. The limited occurrence, importance to genetic diversity and under representation of the sub-type in conservation areas underlies the need to conserve this desert tortoise population. This is especially important given the threats posed by global climate change. As the USFWS 2008 Draft Revised Recovery Plan noted, "Climatic regimes are believed to influence the distribution of plants and animals through species-specific physiological thresholds of temperature and precipitation tolerance. Warming temperatures and altered precipitation patterns may result in distributions shifting northward and/or to higher elevations, depending on resource availability (Walther et al. 2002). We may expect this response in the desert tortoise to reduce the viability of lands currently identified as "refuges" or critical habitat for the species." (USFWS 2008 at 133) The proposed Amargosa SEZ will block any northward shift of this population because it crosses the Amargosa Valley.

The cumulative effects analysis points out that there are 14,070 acres in the proposed SEZ that already have approved projects or projects under NEPA analysis. The SEZ estimates that another 25,300 acres would be developed over a 20 year analysis horizon. However, the DPEIS does not include any analysis of the potential impacts and effects of over 39,000 acres of desert tortoise habitat being destroyed.

[7] Britten, H. B., Riddle, B. R., Brussard, P. F., Marlow, R. and Lee, Jr., T. E. 1997. Genetic delineation of management units for the desert tortoise, *Gopherus agassizii*, in the northeastern Mojave Desert. Copeia 1997: 523-530.

[8] Hagerty, B. 2008. Ecological Genetics of the Mojave Desert Tortoise. PhD. Dissertation. University of Nevada, Reno. 244 pp.

Because of resource conflicts related to water resources, desert tortoise, other threatened and endangered species, and other special status species, BLM should remove the Amargosa SEZ from further consideration.

Comments Specific to the Proposed Dry Lake Valley North SEZ & Delamar Valley SEZ (Nevada)

The Dry Lake and Delamar Valleys are part of the White River Flow System. Groundwater in these two basins has been fully appropriated over-appropriated in down gradient basins. These proposed Dry Lake Valley North SEZ and Delamar Valley SEZ are inappropriate locations for solar energy project development due to the lack of groundwater. BLM should remove the proposed Dry Lake Valley North SEZ and the Delamar Valley SEZ from further consideration.

Comments Specific to the Proposed East Mormon Mountain SEZ & Dry Lake SEZ (Nevada)

The proposed Dry Lake SEZ is located on the Dry Lake playa. Playas are significant ecotypes that are underrepresented in conservation areas. Barren, usually alkaline desert playas (dry lakebeds), are found in closed basins in the Intermountain West. These basins are intermittently (once every few years) or seasonally (every year) flooded. Water is prevented from percolating through the soil by an impermeable subsurface layer and is left to evaporate. Salt crusts and high salt in the soils greatly affect species composition. While the appearance is barren, some species such as iodinebush, black greasewood, spiny hopsage, Lemmon's alkali grass, Great Basin wildrye, saltgrass, or saltbush occur around the margins of the playa. This system grades into salt-desert scrub and sagebrush habitats. Downwind of playas, active and stabilized sand dunes often form. Thus if the subsurface of a playa is disturbed, the playa's integral role in the ecosystem may irreversibly untangle.

Both the proposed East Mormon Mountain SEZ and the proposed Dry Lake SEZ include desert tortoise habitat. East Mormon Mountain is immediately adjacent to the Mormon Mesa DWMA and Beaver Dam Slope DWMA in the Northeastern Mojave Recovery Unit. Recent monitoring reports from USFWS indicate that the northern populations within the Northeastern Mojave desert tortoise Recovery Unit are low and appear to be declining. Because environmental stressors are indicated as a reason for this species decline, these SEZ should be withdrawn from further consideration as Solar Energy Zones.

Comments Specific to the Proposed Gold Point SEZ (Nevada)

The proposed Gold Point SEZ, totaling an area of 4,810 acres, is located in upper Lida Valley, a closed basin lying between MacGruder Mountain and Slate Ridge. The locale is currently pristine and remote from load centers, and a new transmission line would be needed to provide access from the SEZ to the transmission grid. There resident pronghorn herd that stays in the Valley year-round. No other active energy development projects have been proposed near this site. Because of its remoteness, pristine condition, lack of water, and other conflicts, BLM should withdraw the proposed Gold Point SEZ from further consideration.

8. UTAH PROPOSED SOLAR ENERGY ZONES

Three proposed SEZ have been identified in Utah: Escalante Valley (6,614 acres), Milford Flats South (6,480 acres), and Wah Wah Valley (6,097 acres).

The ground water situation in the region is critical with most of the basins currently over-appropriated and closed to new surface water and groundwater appropriations (Utah DWR 2010).

The three study areas lie within BLM grazing allotments. Escalante Valley is within Butte Allotment, Milford Flats South is within the Minersville allotment group, Wah Wah Valley is in Wah-Wah Watson Allotment.

Bald eagle, *Haliaeetus leucocephal*, may occur on all the Utah SEZ. Bald eagles are protected under the under The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c). Although the DPEIS mentions the loss of foraging habitat it fails to analyze risks from structures associated with solar power plants. This deficit must be addressed. The DPEIS recognizes that the fully protected golden eagle (*Aquila chrysaetos*) may forage on the proposed Utah SEZ. The USFWS currently does not issue "take" permits for this species because the species is declining. Loss of foraging habitat that results in a decrease in productivity or nest abandonment is considered "take". Although the DPEIS mentions the loss of foraging habitat it fails to analyze risks from structures associated with solar power plants. Required upgrades to existing transmission lines may exacerbate the risks of take.

Comments Specific to Escalante Valley SEZ (Utah)

The proposed 6,614 acres Escalante Valley SEZ is located in Iron County in southwestern Utah.

This relatively remote site would need construction of extensive new access roads. New transmission lines or upgrades of existing transmission lines would be required to bring electricity from the proposed Escalante Valley SEZ to load centers. The size and location of these are not described further in the DPEIR. However, since these will have similar impacts to the SEZ itself, they must be described in the cumulative effects analysis.

The proposed Escalante Valley SEZ is within Butte grazing allotment and would remove about 20% of the allotment. The SEZ-Specific Design Features states "Consideration should be given to the feasibility of replacing all or part of the lost AUMs through changes in grazing management or in development of additional range improvements on public lands remaining in the allotment." DPEIS at 13.1-5. We suggested in our scoping comments that the BLM should also allow for relinquishment of those AUMs. It is unclear why the BLM believes that it would be appropriate to mitigate impacts to grazing allotments with additional range developments. Range developments have profound impacts of vegetation, soils, and invasive species. We suggested, and BLM has ignored, that the agency facilitate the retiring of grazing allotments as a mitigation measure instead of increasing livestock impacts on the remaining, undeveloped lands.

If development of additional range improvements involves developing waters or constructing fences, the BLM must include the impacts of these foreseeable projects in the cumulative effects analysis.

The proposed Escalante Valley SEZ provides habitat for a number of candidate species and other special status species including the greater sage-grouse, western burrowing owl, the ferruginous hawk, the pygmy rabbit, the bald eagle, and the Utah prairie dog. The Escalante Valley SEZ and its affected area are completely within crucial pronghorn habitat. The cumulative effects must include an analysis of the expected new road construction, and new transmission lines and upgrades on each of these species.

Although it has not been surveyed, the BLM believes that the proposed Escalante Valley SEZ has a high potential for containing prehistoric sites in the dune area on the west side of the SEZ; it also has some potential for containing historic sites. The BLM states that "A cultural resource survey of the entire area of potential effects, including consultation with affected Native American Tribes, would first need to be conducted to identify archaeological sites, historic structures and features, and traditional cultural properties, and an evaluation would need to follow to determine whether any are eligible for listing in the NRHP as historic properties." But this is yet another example of putting the cart before the horse. BLM needs to do these surveys and consultations prior to defining the SEZ, so that the agency can ensure that the SEZ is an area with low resource conflicts.

Comments Specific to Milford Flats South SEZ (Utah)

The proposed 6,480 acres Milford Flats South SEZ is located in Beaver County in southwestern Utah about 21 mi (34 km) northeast of the proposed Escalante Valley SEZ.

This SEZ would need construction of extensive new access roads (about 5 miles). About 19 miles of new transmission lines or upgrades of existing transmission lines would be required to bring electricity from the proposed Milford Flats South SEZ to load centers. The size and location of these are not described further in the DPEIR. However, since these will have similar impacts to the SEZ itself, these reasonably foreseeable projects must be considered in the cumulative effects analysis.

The proposed Milford Flats South SEZ is within the Minersville allotment group and would remove about 10-15% of the allotments. DPEIS 13.2-5. The SEZ-Specific Design Features states "Consideration should be given to the feasibility of replacing all or part of the lost AUMs through changes in grazing management or in development of additional range improvements on public lands remaining in the allotment." DPEIS at 13.2-5. We suggested in our scoping comments that the BLM should also allow for relinquishment of those AUMs. It is unclear why the BLM believes that it would be appropriate to mitigate impacts to grazing allotments with additional range developments. Range developments have profound impacts of vegetation, soils, and invasive species. We suggested, and BLM has ignored, that the agency facilitate the retiring of grazing allotments as a mitigation measure instead of increasing livestock impacts on the remaining, undeveloped lands. If development of additional range

improvements involves developing waters or constructing fences, the BLM must include the impacts of these foreseeable projects in the cumulative effects analysis.

The proposed Milford Flats SEZ provides habitat for a number of list, candidate, and other special status species including the greater sage-grouse, western burrowing owl, the ferruginous hawk, the pygmy rabbit, the bald eagle, and the Utah prairie dog. The Milford Flats SEZ and its affected area are completely within crucial pronghorn habitat. The cumulative effects must include an analysis of the expected new road construction, and new transmission lines and upgrades on each of these species.

The BLM states that "A cultural resource survey of the entire area of potential effects, including consultation with affected Native American Tribes, would first need to be conducted to identify archaeological sites, historic structures and features, and traditional cultural properties, and an evaluation would need to follow to determine whether any are eligible for listing in the NRHP as historic properties." But this is yet another example of putting the cart before the horse. BLM needs to do these surveys and consultations prior to defining the SEZ, so that the agency can ensure that the SEZ is an area with low cultural resource conflicts.

Comments Specific to Wah Wah Valley SEZ (Utah)

The proposed 6,097 acres Wah Wah Valley SEZ is located in Beaver County in southwestern Utah about 21 miles northwest of the proposed Milford Flats South SEZ.

The proposed Wah Wah Valley SEZ will have serious impacts on special status species particularly the greater sage-grouse. Transmission access to the proposed Wah Wah Valley SEZ currently does not exist. The nearest existing transmission line is a north–south running 130-kV about 42 miles east of the SEZ. As of February 2010, there were no ROW applications for solar projects within the SEZ. Because of the resource conflicts, the lack of transmission and the lack of demand, BLM should drop this SEZ from further consideration.

The proposed Wah Wah Valley SEZ will occupy about 2.6% of the Wah-Wah Lawson allotment. DPEIS 13.3-23. The SEZ-Specific Design Features states "Consideration should be given to the feasibility of replacing all or part of the lost AUMs through changes in grazing management or in development of additional range improvements on public lands remaining in the allotment." DPEIS at 13.1-5. We suggested in our scoping comments that the BLM should also allow for relinquishment of those AUMs. It is unclear why the BLM believes that it would be appropriate to mitigate impacts to grazing allotments with additional range developments. Range developments have profound impacts of vegetation, soils, and invasive species. We suggested, and BLM has ignored, that the agency facilitate the retiring of grazing allotments as a mitigation measure instead of increasing livestock impacts on the remaining, undeveloped lands. If development of additional range improvements involves developing waters or constructing fences, the BLM must include the impacts of these foreseeable projects in the cumulative effects analysis. In this case, the effect on the permittee would be so small that BLM should simply decrease the authorized AUM pro rata.

The proposed Wah Wah Valley SEZ provides habitat for a number of candidate species and other special status species including the greater sage-grouse, western burrowing owl, the ferruginous hawk, the pygmy rabbit, the bald eagle, the golden eagle, and the Utah prairie dog. The Wah Wah Valley SEZ and its affected area are completely within crucial pronghorn habitat. The cumulative effects must include an analysis of the expected new road construction, and new transmission lines and upgrades on each of these species. The proposed transmission line that would be required to develop this SEZ passes through crucial greater sage-grouse brooding habitat. That conflict alone is sufficient to enough to invalidate any further selection of this proposed SEZ

Only one small, 2-acre survey for a gravel pit has been conducted within the proposed Wah Wah Valley SEZ; consequently, no archaeological sites have been recorded by the BLM. DPEIS at 13.3-231. Although it has not been surveyed, the BLM believes that the proposed Wah Wah Valley SEZ has the potential to contain significant cultural resources, although the potential is relatively low. The BLM states that "A cultural resource survey of the entire area of potential effects, including consultation with affected Native American Tribes, would first need to be conducted to identify archaeological sites, historic structures and features, and traditional cultural properties, and an evaluation would need to follow to determine whether any are eligible for listing in the NRHP as historic properties." But this is yet another example of putting the cart before the horse. BLM needs to do these surveys and consultations prior to defining the SEZ, so that the agency can ensure that the SEZ is an area with low resource conflicts.

9. THE DPEIS IS FATALLY FLAWED AND WILL REQUIRE RECIRCULATION OF A REVISED DPEIS

The DPEIS is fatally flawed in a number of respects that will require the BLM to prepare a supplemental NEPA document for recirculation for public comment. The DPEIS provides no quantitative estimates of the numbers of affected individuals for the many threatened and endangered, and special status species that will be affected by the three alternatives. It fails to even list the threatened and endangered species that occur in the areas opened to development under the preferred alternative.

The BLM states in the DPEIS that for its preferred alternative it was unable to obtain complete geographic information system (GIS) data across the six-state study area and thus could not map the exact footprint of the alternative nor calculate the exact acreage. DPEIS at 2-3.

These deficiencies amount to failure to comply with provisions of the Endangered Species Act, FLPMA as well as NEPA. The BLM should prepare a revised Draft PEIS that reviews an adequate range of alternatives, that adequately describes the direct, indirect, and cumulative impacts, and that takes a hard look at those environmental impacts.

We thank you for the opportunity to provide these comments on the Draft PEIS, and we look forward to seeing our recommendations incorporated in the next iteration of this document.

Please continue to include Western Watersheds Project on your list of interested public for all future mailings.

Sincerely,

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