

## Federal Utility Partnership Working Group Meeting

January 14-15, 2014

Co-hosted by Xcel Energy and NREL

Golden, CO

### Meeting Record

The Federal Utility Partnership Working Group (FUPWG) is a joint effort between the Federal Energy Management Program (FEMP) and the utility industry to stimulate the exchange of information among participants and foster energy efficiency projects in Federal facilities nationwide.

The FUPWG meeting was held in Golden, CO on January 14-15 and was attended by 223 professionals:

- 81 Federal agency/lab representatives
- 48 utility officials
- 94 representatives from energy-related organizations

An additional 94 professionals participated in the Tuesday morning session via webinar. This was the second time a webinar option was offered. Feedback from the participants was very positive, especially from Federal contacts unable to receive approval to attend the meeting due to sequestration-related travel restrictions. The FUPWG Steering Committee plans to continue offering a portion of the FUPWG Seminar via webinar.

The complete meeting participant list can be found in Appendix A, and the agenda is provided in Appendix B. The meeting presentations can be found at <http://energy.gov/eere/femp/downloads/fupwg-winter-2014-agenda-and-presentations>.

#### **Welcome Remarks from the Host Utility**

*Jerome Davis, Regional Vice President - Public Service Company of CO, Xcel Energy*

Mr. Davis welcomed attendees to the 2014 Winter FUPWG Meeting. The Public Service Company of Colorado is an operating company under Xcel Energy. There are eight states included in this operating company which include 3.4 million electric company customers, and 1.9 million gas customers. For more than a century the company has provided safe, reliable, clean energy at a competitive price. Mr. Davis highlighted the key values of the company which include:

- Reliability – customers trust that the services and product will be there when needed.
- Competitive price
- Responsiveness – especially to whatever Mother Nature brings.
- Partnerships – can't do this alone. Xcel Energy is heavily invested in the community and believes that developing partnerships is the way to do business. Federal government customers, as well as the Federal research labs in this region, are extremely important. The Denver metro area alone is home to 125 Federal facilities. Partnerships with the research labs allow Xcel Energy to advance and bolster renewable energy offerings. These partnerships allow Xcel Energy to learn about, test, and promote technology that offers the greatest promise for solving many of the environmental challenges that we face today.

Xcel Energy offers a diverse portfolio of energy resources which helps them balance reliability and price. This portfolio includes energy conservation programs that assure that they produce only the energy that is needed. Xcel Energy is the number one wind energy provider in the nation, is a top ten solar capacity utility, and has one of largest demand side management programs in the nation. Fuel diversity is also an

important part of the strategy. Xcel continues to move forward toward a lower carbon future, and the combination of low-cost wind and large-scale solar plants gives them an opportunity. Mr. Davis stressed the importance of investments. Xcel Energy invests more than \$1 billion a year in their energy delivery system and plans to spend \$6 million over the next 5 years to keep ahead of the pace. The company is confident that these investments will allow Xcel Energy to provide high-quality service while maintaining their commitment to providing a clean energy portfolio at a competitive price.

### **DOE/FEMP Welcome and Announcements**

*David McAndrew, Chair of the Federal Utility Partnership Working Group, FEMP,  
U.S. Department of Energy*

David McAndrew, FEMP's Project Lead for UESCs and state energy efficiency incentive programs, welcomed the attendees to the meeting, delivered logistics-related announcements, and thanked Art Kwerneland and Xcel Energy for hosting the meeting. Mr. McAndrew announced that there were approximately 100 attendees joining the meeting via webinar and welcomed these participants to the meeting. Members of the Steering Committee were recognized for their efforts in planning the FUPWG event. Mr. McAndrew announced that continuing education units were being offered to FUPWG attendees and outlined the process for receiving CEUs.

Mr. McAndrew provided an update on some of FEMP's key FY 2014 projects including the UESC Guidebook. The UESC Guide is now complete and is posted on the FEMP website. The UESC Guidebook has been very well received and is a great new tool to help streamline the UESC process. Future training dates were reviewed. There is an Advanced UESC Workshop immediately following FUPWG, and the next workshop is scheduled for March 5-6 in Chicago. UESC webinars are scheduled for January 28 and February 18. Participants were encouraged to contact FEMP if they are interested in hosting a FUPWG Seminar and reminded them that agency-specific UESC training is available. Mr. McAndrew also mentioned that FEMP is developing a new webinar for utilities who are interested in learning more about UESCs and how to start a UESC program.

Mr. McAndrew discussed the new Targeted Utility Rebate and Incentive Outreach Program. Federal participation in utility rebate and incentive programs has been low mainly due to the fact that agencies are not aware of these programs or they don't realize that they can accept these rebates and incentives. This program will assist utilities in reaching out to their Federal customers to help them become more aware of these incentives and understand how they can take advantage of them. FEMP compiles a one-page summary for the federal customer outlining a utilities rebate and incentive program, and includes information on Federal requirements and authorities. FEMP works with the utility to identify Federal customers in their territory and sends an email blast to all Federal customers.

Mr. McAndrew reminded the attendees that FEMP provides project support at every step of the project and agencies are encouraged to contact FEMP if they need project assistance.

The 2014 Spring FUPWG Seminar will be hosted by Virginia Natural Gas in Virginia Beach, VA. Dates are May 7-8.

To view Mr. McAndrew's presentation, visit  
[http://energy.gov/sites/prod/files/2014/01/f7/fupwg\\_winter2014\\_mcandrew\\_0.pdf](http://energy.gov/sites/prod/files/2014/01/f7/fupwg_winter2014_mcandrew_0.pdf).

### **Washington Update**

*Skye Schell, Program Manager, FEMP, U.S. Department of Energy*

Mr. Schell began his presentation by thanking Xcel Energy and NREL and sharing his thoughts on how important these meetings are in helping FEMP meet their very aggressive goals. Mr. Schell provided an overview of where we have been in terms of financing projects both with appropriations and performance contracting and provided information on the Compliance Tracking System (CTS). The CTS database

indicates an investment opportunity of nearly \$11B. Mr. Schell shared FEMP's organization chart and encourage attendees to contact FEMP staff members and visit the website to learn more about the services offered.

Mr. Schell stressed the importance of data collection and encouraged all agencies and utilities to report data to FEMP. This data provides FEMP with clear insights into what is happening in the world of UESC and the impact the program is having. Data on UESC projects has been collected since 1991, and information on almost 2,000 UESC projects has been tracked. More than \$2.7 billion has been invested in federal facility upgrades and retrofits through the UESC funding mechanism. Mr. Schell recognized agencies and utilities that submit data and encouraged everyone to follow their lead.

**Assisting Federal Facilities with Energy Conservation Technologies (AFFECT)** is a new grant program that is providing \$5M in direct funding for capital CHP and renewable energy projects. The target date to announce selections is April 29, 2014.

FEMP ENABLE focuses on helping Feds with smaller projects. There are thirteen qualified ESCOs who can provide services under GSA Schedule 84, and included ECMs have just been expanded to include solar (PV) and related HVAC equipment. David McAndrew mentioned that Julia Kelley and ORNL are working on converting the ENABLE tools so they can be used for UESC projects.

FEMP's training program became accredited in October 2013 by the International Association for Continuing Education and Training (IACET). IACET accreditation allows FEMP to offer certified Continuing Education Units (CEUs) for qualified training programs.

Mr. Schell provided information on the new Presidential Memorandum – Federal Leadership on Energy Management, signed by President Obama on Dec. 5. The memo directs the Federal Government to consume 20 percent of its electricity from renewable resources by 2020 – more than double its current level. DOE will issue updates to current interagency RE guidance within 180 days. Mr. Schell then provided an update on the Performance-Based Contracting Challenge, Issued by President Obama in Dec. 2011 to challenge Federal agencies to enter into \$2 billion worth of performance-based energy contracts. UESC accounts for approximately 17% of all PPCC projects. The administration has decided to extend this challenge to 2016 and up the goal. The goal will be determined in the next few months.

Mr. Schell shared details on the new Green Button Initiative. Green Button is an industry-led effort in response to a White House call to action to empower consumers with their own energy usage information. Green Button empowers electricity consumers to securely download their own energy usage information from their utility. Armed with this information, consumers can use a growing array of web and smartphone tools to make more informed energy decisions. GSA will serve as a test bed or pilot for Green Button.

Mr. Schell concluded his presentation with an update on pending legislation. House and Senate finished work on the Defense Authorization Act before the end of the year, and UESC language was not included. Currently two stand-alone bills from Reps. Gardner, Welch, and Buschon (H.R. 3587) and Sens. Schatz, Alexander, and Coats (S.1652) to clarify that UESCs may have a term of up to 25 years are pending. These bills could possibly get a ride on Shaheen-Portman, but it is still an uphill fight because of the scoring issue.

To view Mr. Schell's presentation, visit [http://energy.gov/sites/prod/files/2014/01/f7/fupwg\\_winter2014\\_schell.pdf](http://energy.gov/sites/prod/files/2014/01/f7/fupwg_winter2014_schell.pdf).

### **National Renewable Energy Laboratory Overview**

*Bobbi Garrett, Deputy Laboratory Director, Strategic Programs and Partnerships, NREL*

NREL is one of three DOE National Energy Laboratories. Idaho National Lab focuses on nuclear energy, National Energy Technology Laboratory focuses on fossil energy, and NREL's mission is to advance

renewable energy and energy efficiency. Other national labs also work on energy, are increasingly working collaborative, which is a positive trend.

NREL has two major campuses in Colorado. The physical assets are owned by the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy. NREL is operated by the Alliance for Sustainable Energy under a performance-based contract with DOE. NREL has 2432 staff members, and the campus is a living model of sustainable energy. NREL has more than 400 active partnerships that help to amplify the impact of the laboratory. The majority of NREL's funding comes from U.S. DOE/EERE, but NREL also works with other Federal agencies, non-Federal customers, and other DOE programs. NREL's focus areas go from concept to consumer and include science, technology research, systems research, commercialization, deployment, and analysis.

The scope of NREL's research portfolio includes the following.

- Building Energy Efficiency – advanced components, performance monitoring/verification, and whole-building energy modeling
- Renewable Generation – solar, wind, marine hydrokinetics and geothermal
- Sustainable Transportation – advanced biofuels, hydrogen/fuel cells and advanced vehicles
- Energy Systems Integration – emerging area which Brian Hannegan covered during the next presentation

NREL's energy analysis and decision support is one of the lab's core competencies. NREL developed Open Energy Information (OpenEI.org), which hosts NREL's tools and data on a community platform.

NREL's campus is a leadership example for sustainability, having three LEED platinum certifications and the net-zero-energy Research Support Facility.

NREL works with their partners through a variety of partnering mechanisms which include work-for-others agreements, cooperative research and development agreements, agreements for commercializing technology, and user agreements.

To view Ms. Garrett's presentation, visit:

[http://energy.gov/sites/prod/files/2014/01/f7/fupwg\\_winter2014\\_garrett\\_0.pdf](http://energy.gov/sites/prod/files/2014/01/f7/fupwg_winter2014_garrett_0.pdf)

## **Energy Systems Integration**

*Dr. Bryan Hannegan, Associate Laboratory Director, NREL*

Energy systems integration is one of the four pillars of the NREL mission going forward. Dr. Hannegan shared statistics on the drop in cost of wind, solar PV, LED lights, and electric vehicles over the last few years. If these trajectories continue, we are on a path to where energy efficiency and renewable energy are not just niche applications in a system but the actual system itself. Integrating these new technologies into the grid brings in a tremendous new challenge in the form of variability. High use of wind and solar means lesser but more variable use of other assets. High efficiency, demand response, and new loads are changing demand and making it more variable. The existing T&D grid is increasingly strained by two-way power flow, and there is a need for flexibility in system operations to absorb growing variability.

Energy systems integration is the process of optimizing energy systems across multiple pathways and scales. It is not just about the electricity pathway but also includes thermal, fuel, and data pathways.

NREL's energy systems integration activities to date include solar and wind, grid planning and operations, energy storage, buildings, hydrogen and fuel cells, and advanced vehicles. The goals of the new energy system integration program are to:

1. integrate technologies into system – characterize and predict how components and devices will interact with others in the system,
2. integrate across functional layers – characterize and predict how these devices will interact with controls, communications and markets, and

3. integrate across physical scales – apply this framework to the optimization of existing and future energy systems at a variety of scales.

Dr. Hannegan shared some information on NREL's new Energy Systems Integration Facility (ESIF), which many of the attendees are touring while attending this meeting. ESIF is NREL's largest R&D facility with space for 200 NREL staff and research partners. There are 15 state-of-the-art hardware laboratories. ESIF is a national asset where users can run experiments without running the risk of blacking out neighbors. ESIF linkage to other facilities enables joint experiments involving both transmission and distribution system elements. ESIF is a key node in the emerging network for ESI research, development, demonstration, and analysis.

To view Dr. Hannegan's presentation, visit:

[http://energy.gov/sites/prod/files/2014/01/f7/fupwg\\_winter2014\\_hannegan\\_0.pdf](http://energy.gov/sites/prod/files/2014/01/f7/fupwg_winter2014_hannegan_0.pdf).

### **Energy Reliability in a Changing Landscape**

*Julieta Giraldez, Research Engineer, NREL*

*Steve Kiesner, Director, National Customer Markets, Edison Electric Institute*

*Bill Eisele, South Carolina Electric and Gas*

*Dave Corbus, Laboratory Program Manager, NREL*

Julieta Giraldez with NREL began the presentation with a discussion focusing on valuing energy security. NREL did some work with the Department of Defense to get a better understanding of the value of energy security using methodologies including the microscopic approach, which is based on outage and cost information from customer surveys. NREL designed a survey that assesses the costs associated with power failures at military installations. They compared the customer damage function under different scenarios at two military installations – MCAS Miramar and Fort Belvoir. Details on the study, "Valuing Energy Security: Customer Damage Function Methodology and Case Studies at DoD Installations," can be found at <http://www.nrel.gov/docs/fy13osti/55913.pdf>.

Steve Kiesner then discussed how the electric power industry is leading the transformation to make the grid more flexible and more resilient and able to meet the growing demands of our digital society. Industry infrastructure investments are increasingly addressing reliability issues and environmental and other policy requirements. The electric distribution system is in transition, and customers have new distributed energy resource (DER) options, including distributed generation (DG). The structure and operation of distribution systems will change, as "smart" infrastructures are built out and new DER technologies are deployed. New regulatory policies and rate design are needed in order to ensure reliability, safety, and fairness, so that all users of the grid contribute to grid infrastructure. Mr. Kiesner feels that the best rate approach for DG is straight/variable pricing (SFV). An SFV rate design recovers fixed costs through fixed charges and variable costs (fuel, purchased power) through per-kWh charges. There is a great need to have substantial, ongoing conversations to educate one another and address common goals regarding energy security.

Bill Eisele focused on some of the basics of energy security. He explained that there are many definitions of energy security that are offered by many experts all with differing viewpoints. The key components of energy security include generation, delivery, quality, quantity, timeliness, type, and price. The grid is the delivery system which gets power from the generator to the end user. Customers own part of the grid, and everything attached to the grid is affected by actions of all parties on the grid. The utility is usually the system operator for a region and has the ability to manage the fluctuations that occur on the grid. Utility behavior is heavily regulated – customer behavior generally is not. Mr. Eisele then shared some information on reliability indicators and how they are measured. In order to understand outages and reliability the government needs to be collecting the same data on their systems. Metrics include:

- SAIFI – system average interruption frequency index
- SAIDI – system average interruption duration index
- MAIFI – momentary average interruption frequency index



Energy security includes the reliability of the generation and delivery systems and is dependent upon the total grid, not just the utility grid.

Dave Corbus focused on the partnerships that are needed to bring about innovation for the utility of the future. The system has been changing and we have come a long way. The future customer experience will include energy efficiency, smart appliances, electric vehicles, distributed energy resources, and grid flexibility. The future utility experience will focus on becoming predictive rather than reactive. Successful partnerships with grid stakeholders are key to meeting challenges and enhancing energy reliability. Mr. Corbus talked about grid integration analysis projects that bring together utilities, national labs, grid experts, and key state stakeholders to partner to find ways to deal with unique grid challenges.

To view the presentations from this session visit:

[http://energy.gov/sites/prod/files/2014/01/f7/fupwg\\_winter2014\\_kiesner\\_0.pdf](http://energy.gov/sites/prod/files/2014/01/f7/fupwg_winter2014_kiesner_0.pdf)

[http://energy.gov/sites/prod/files/2014/01/f7/fupwg\\_winter2014\\_eisele\\_0.pdf](http://energy.gov/sites/prod/files/2014/01/f7/fupwg_winter2014_eisele_0.pdf)

[http://energy.gov/sites/prod/files/2014/01/f7/fupwg\\_winter2014\\_corbus\\_0.pdf](http://energy.gov/sites/prod/files/2014/01/f7/fupwg_winter2014_corbus_0.pdf)

### **Xcel Energy Program, Services and Successes**

*Derek Shockley, Trade Relations Manager and Team Lead, Xcel Energy*

Mr. Shockley highlighted some of Xcel Energy's key accomplishments and shared information on the company's robust portfolio of demand-site management (DSM)/energy efficiency programs.

- No. 1 wind power provider – 8<sup>th</sup> consecutive year, AWEA.org
  - Windsource – One of the largest voluntary green-pricing programs in USA
- No.5 in solar capacity
  - One of largest photovoltaic systems and growing – 8.2 megawatts
  - Solar\*Rewards – 7,146 solar systems, 75.9 DC megawatts
- Energy Star 2012 Award for Sustained Excellence
- 2012-2013 Dow Jones Sustainability Index for the sixth year

Xcel Energy helps Colorado meet energy savings goals by:

- providing incentives to customers to adopt energy-efficient technologies,
- offering rebates which provide an incentive to promote energy efficiency in the marketplace,
- treating long-term energy savings over the life of the equipment as paramount, and
- Xcel Energy brand name and neutral third-party endorsement.

Mr. Shockley then provided a summary of Xcel Energy's business programs:

- Studies & Audit-Based Incentives – Xcel Energy funds a portion of a study providing the customer with an understanding of how their facility or unique systems use energy and identifies rebate opportunities.
- Prescriptive Rebate Programs – Predetermined rebate amounts and related savings for various energy-saving technologies. Can apply for these after the fact.
- Custom Rebate Programs – For equipment and conservation efforts outside prescriptive requirements or not covered by the prescriptive programs.

Mr. Shockley provided an overview of Xcel Energy's energy efficiency and renewable energy activity with Federal agencies. Xcel has been involved in more than 100 Federal projects over the last three years with a total of approximately 22.4 Gwh in savings. NREL is an important partner and has been instrumental in the development of Xcel Energy's Web-based energy efficiency modeling program for new construction using NREL's OpenStudio tools to maintain quality and reduce costs.

To view Mr. Shockley's presentation, visit:

[http://energy.gov/sites/prod/files/2014/01/f7/fupwg\\_winter2014\\_Shockley%20.pdf](http://energy.gov/sites/prod/files/2014/01/f7/fupwg_winter2014_Shockley%20.pdf).

## **Case Study: Colorado Springs Utilities/Fort Carson**

*Frank Kinder, Colorado Springs Utilities*

*Mark Mahoney, Army Regional Environmental and Energy Office*

Mr. Mahoney began his presentation by sharing details on the vast size and complexities of the Army's 2013 universe, which is about the size of 152 cities. In 2004 there was a sustainable environmental program within the Army. Drivers for change resulted in the creation of Net Zero programs for energy, water, and waste. Net Zero enhances operational readiness which reduces costs.

Mr. Mahoney then discussed the Army's Net Zero planning concept, which starts with assessment or identifying opportunities, moves on to the roadmap stage, and ends with the transition stage. The steps of the Net Zero pyramid start at the top with reduction, re-purpose, recycling and composting, and energy recovery, with disposal at the bottom.

- A Net Zero Energy Installation is an installation that produces as much energy on site as it uses over the course of a year.
- A Net Zero Water Installation limits the consumption of freshwater resources and returns water back to the same watershed so as not to deplete the groundwater and surface water resources of that region in quantity or quality. Key goals of Net Zero water are to contribute to water security and reduce freshwater demand through water efficiency and conservation
- A Net Zero Waste Installation is an installation that reduces, reuses, and recovers waste streams, converting them to resource values with zero solid waste to landfill. The Army's goal is to have no solid waste disposal in landfills by FY2020.

A Net Zero Installation applies an integrated approach to management of energy, water, and waste to capture and commercialize the resource value and/or enhance the ecological productivity of land, water, and air. This approach must include the following.

- Dramatic demand-side energy use reduction.
- We must build and retrofit our building stock today with life-cycle costs in mind.
- Right mix of energy-generation technologies and strategies that contribute to energy security.
- Clear and flexible implementation strategies based on potential technology innovations and mission changes.

Mr. Mahoney discussed Fort Carson's efforts towards achieving Net Zero. This installation took advantage of their need for new facilities and they are now the largest LEED campus in the country, with 30 silver and 34 gold buildings and one platinum building. Fort Carson is well on the way to achieving their Net Zero goals. They have reduced energy intensity by 17% and water intensity by 47% and have reduced waste production by 45%.

Mr. Mahoney introduced Frank Kinder who focused his presentation on how Fort. Carson accomplished these reductions. Mr. Kinder provided some background on Colorado Springs Utilities (CSU). CSU has more than 500,000 customers and provides four services: natural gas, energy, water, and wastewater. They service five installations including Fort Carson and the Air Force Academy. Fort Carson opened in 1942 during WWII. The installation is located on 137,403 acres and has more than 30,000 residents.

Mr. Kinder talked about the drivers involved in the development of the Fort Carson/Colorado Springs Utilities partnership. These include:

- 2000s energy & water crises – commodity flux
- BRAC – Base Realignment and Closure – threat
- Encroachment – CO growth and sprawl – threat
- EPACT – improvements in performance & use
- Cost control + risk management; \$\$\$ & permits
- Demographic/social trends, usage, competition
- Legal, responsibility, sustainability ethic

- SWOT analysis (strengths, weaknesses, opportunities, and threats) and community engagement

Fort Carson's 2002 Sustainability Plan includes 25-year stretch goals and a 2027 completion date. Community partnership was a primary strategy, and CSU reached out to NREL, PNNL, USAMRA, USACE, CERL and SPiRiT to assist with plan development.

CSU's Energy Vision: "By 2020, Colorado Springs Utilities will provide 20% of its total electric energy through renewable sources, reduce average customer use by 10%, and maintain a 20% regional cost advantage."

Mr. Kinder then discussed some of CSU's water conservation and energy DSM rebate programs and provided an overview of some of their key projects. Through a power purchase agreement CSU built and maintains a 2 MW solar array which provides Fort Carson with lower-cost electricity in return for leasing the site. The facility generates enough electricity annually to power 540 homes, or 2.3% of the fort's energy consumption. This project is expected to save Fort Carson \$500,000 in energy costs over the life of its 20-year contract with the utility.

To review Mr. Mahoney and Mr. Kinder's presentation, visit [http://energy.gov/sites/prod/files/2014/01/f7/fupwg\\_winter2014\\_%20mahoney\\_kinder%20\\_0.pdf](http://energy.gov/sites/prod/files/2014/01/f7/fupwg_winter2014_%20mahoney_kinder%20_0.pdf).

### **Update on Smart Power Infrastructure Demonstration for Energy Reliability and Security (SPIDERS) Joint Capabilities Technology Demonstration (JCTD)**

*Bill Waugaman, N-NC Energy Security Lead, U.S. Northern Command*

Mr. Waugaman began his presentation with an overview of SPIDERS which is a partnership between DOE, DOD, DHS, USACE, NAVFAC, the public utilities, and national laboratories. U.S. Northern Command was set up after 9/11 to defend the homeland. The primary objective of SPIDERS is mission assurance, or to integrate renewable energy, energy storage, and traditional diesel back-up generation in a cyber-secure microgrid. Military installations are used as test beds to develop cyber security best practices. Other objectives include:

1. Protect task-critical assets from loss of power due to cyber attack.
2. Integrate renewables and other distributed energy generation concepts to power task-critical assets in times of emergency.
3. Sustain critical operations during prolonged power outages.
4. Manage installation electrical power and consumption efficiency to reduce petroleum demand, carbon "footprint," and cost.

Mr. Waugaman then discussed the four SPIDERS phases. Phase 2 was just completed and they are moving into Phase 3.

Phase 1 – Pearl-Hickam Circuit Level Demo. 600% increase in reliability. 39% fuel savings.

- Renewables
- Energy Management
- SCADA Cyber Test at DOE National Laboratories

Results: Successful technical demonstration in Dec. 2012 and successful operational demonstration in Jan. 2013. No interruptions to critical load; renewables sources were integrated and reduced diesel fuel use (reduced CO<sub>2</sub> emissions by 42%); increased power endurance by 30.4%; improved power reliability by 39.2 fold; and cyber security was verified with a high level of compliance. Shared results and lessons learned at June 2013 SPIDERS Industry Day.

Phase 2 – Fort Carson Microgrid

- Large Scale Renewables
- Vehicle-to-Grid



- Smart Microgrid
- Critical Assets
- CONUS Homeland Defense Demo
- COOP Exercise

Results: Construction completed in August 2013. Successfully tested the bi-directional electric vehicle charging stations at NREL. Technical demonstration executed in Sept. 2013 and 74-hour operational demonstration performed in Oct. 2013. Operational Utility Assessment Report will be released in March 2014. Cyber security testing is still going on.

Phase 3 – Camp Smith Energy Island. 65% of the engineering design has been completed and construction RFP is planned for April 2014.

- Entire Installation Smart Microgrid
- Islanded Installation
- High Penetration of Renewables
- Demand-Side Management
- Redundant Backup Power
- Ancillary Services

#### Transition

- Template for DOD-wide use
- CONOPS
- TTPs
- Training Plans
- Transition to Commercial Sector
- Transition Cyber-Security to Federal Sector and Utilities

Mr. Waugaman discussed the interaction between SPIDERS Cyber and JBASICS Interactions. SPIDERS is a foundation that JBASICS uses to develop cyber defense TTPs/CONOPS for DOD. JBASICS provides additional cyber testing to validate SPIDERS reference architecture at a higher level. JBASICS results will be provided as recommendations in the SPIDERS Camp Smith Transition Agreement resulting in a robust system for PACOM.

To review Mr. Waugaman's presentation, visit

[http://energy.gov/sites/prod/files/2014/01/f7/fupwg\\_winter2014\\_Waugaman.pdf](http://energy.gov/sites/prod/files/2014/01/f7/fupwg_winter2014_Waugaman.pdf).

#### **Partnerships and Caring for America's Resources**

*Lizette Richardson, Division Chief, National Park Service*

*Richard Turk, Value Analysis Program Coordinator, National Park Service*

Lizette Richardson and Richard Turk of the National Park Service (NPS) shared with the group the involvement the National Park Service had with the Disaster Relief Appropriations Act. The act made supplemental appropriations available for fiscal year 2013 to improve and streamline disaster assistance for Hurricane Sandy damage and for other purposes.

Hurricane Sandy was a category 1 storm, spanning 1,000 miles and affecting 24 states and the entire eastern seaboard. The damage to the United States totaled around \$65 billion and affected several national parks. The Department of Interior (DOI) received \$829 million from the Disaster Relief Appropriations Act. Though NPS facilitates mainly smaller projects, they took on Hurricane Sandy recovery projects at the Statue of Liberty, Ellis Island, Haines Point and Fire Island using DOI appropriations of \$329.8 million to administer the projects. Project types ranged from boardwalks, debris removal, roads, exhibits, restoration, and buildings, to HVAC and utility projects.

The NPS Hurricane Sandy Recovery Projects are a part of the government-wide Hurricane Sandy Task Force. The NPS team needed to define and assess the issues to determine ways to best strategize. The NPS Director wanted to follow key strategic measures, such as strong assessment conditions, area-wide planning, good planning to ensure resiliency, rapid review teams, value analysis, and to design and build smart.

The rapid review teams (RRT) consisted of NPS senior leadership, subject matter experts, and facility, natural resource, coastal geographers, cultural resource, business services, sustainability and regional representatives. RRT had a pre-review process for projects. Service-wide review was completed on projects greater than \$500K and region-wide reviews done for those smaller than \$500K. Regional representatives were used to define the scope of the project. A SharePoint tracking system was used with the regional office using GIS data. Sea and storm surge levels were analyzed with the data.

Construction program management involves division programs including value analysis, capital asset planning, budget, cost and scope oversight, and facility planning models. Policy guidance was centralized around design and construction, climate change, sustainability, and freeze-the-footprint.

The Statue of Liberty project had many challenges to overcome on a tight schedule, but the monument still opened on July 4<sup>th</sup>. The design process challenge required the RRT to deal with overcoming mechanical issues, dock location, and dealing with a screening facility for a secure site. Two docks needed to be restored, and an intermittent screening facility needed to be used.

Ellis Island faced tight scheduling challenges as well but opened at the end of October (cooling features will open summer 2014). Ellis Island faced the largest utility issue, with around \$30 million worth of mechanical, electrical and power failures to address. NPS review teams followed the key strategic measures set forth by the Director to increase resiliency and sustainability as air handlers were at risk. The task force designated an Adjusted Base Flood Elevation (ABFE).

Restoration of such prominent landmarks raised several issues about the destruction that Hurricane Sandy caused. Along with design challenges, the question had to be raised: whether an investment should be made to relocate landmarks to ensure that similar damage will not occur in the future.

The review teams faced many challenges. It was necessary to evaluate how to remediate structural loads to survive events that may occur in the future. The turnaround time of projects at major national landmarks can also be an issue. Communication was vital to ensure that the right teams were in the right place at the right time, which sometimes led to challenges. Another significant challenge was obtaining accurate assessments.

NPS is currently exploring ESPC options, but has only successfully claimed rebates in project efforts in non-disaster situations. There is the potential to go after rebates, which will be added to the Rapid Review Team discussions. NPS has been able to estimate the response time for these projects to come back online and quantify isolated investments.

To review Ms. Richardson's and Mr. Turk's presentations visit:

[http://energy.gov/sites/prod/files/2014/01/f7/fupwg\\_winter2014\\_richardson\\_turk.pdf](http://energy.gov/sites/prod/files/2014/01/f7/fupwg_winter2014_richardson_turk.pdf).

### **Renewable Energy Panel – National Wind Technology Center and SolarTac Technology Acceleration Center**

*Robi Robichaud, Senior Engineer, National Renewable Energy Laboratory (NREL)*

*Beth Chacon, Environmental Policy Manager, Xcel Energy*

Robi Robichaud provided an overview of NREL's National Wind Technology Center (NWTC), which is located at the base of the foothills just south of Boulder, Colorado. The center is the nation's premier wind energy technology research facility. NWTC provides valuable opportunities for wind technologies,

research, and development. Test sites at NWTTC experience diverse wind flow patterns that are ideal for advancing wind technologies.

Testing has been ongoing since 1977, making NWTTC a leader in design, analysis, and codes. NREL produces a lot of code development that is used by manufacturers. Testing facilities work to reduce barriers to large-scale deployment. Unique test facilities include blade testing, a dynamometer, and CART Turbines (controls advanced research turbines). Some key goals are to improve windplant power production, reduce wind plant capital cost, improve wind plant O&M cost, and eliminate barriers to large-scale deployment. The site has approximately 150 staff on site and a \$35 million budget.

Currently NREL supports blade testing for DOE and the industry using their patented blade-testing technologies. Developments of blade test facilities worldwide is supported by NREL, including a new large blade test facility at the Massachusetts Clean Energy Center (MassCEC) Wind Technology Testing Center (WTTTC) with the Massachusetts Technology Collaborative. WTTTC offers many certification tests for turbine blades up to 90 meters in length. The center will help the industry to deploy the next generation of wind turbine technologies. Larger blades are geared toward offshore wind.

These facilities are also engaging in drivetrain testing, upgrading the current dynamometer technologies. Dynamometers are a means of validating new drivetrain designs. They allow industry and testing agencies alike to verify the reliability of wind turbine drivetrain prototypes. A 2.5 MW dynamometer was commissioned in 1999 and used by the industry and in many R&D activities. The dynamometer was upgraded with Recovery Act funding of about \$10 million. Commissioned in 2013, it has a new 5 MW driveline.

At other test sites, including Horns Rev, an offshore wind farm, many new discoveries were made that will need to be further investigated and mitigated. At Horns Rev, there was a higher wake impact than originally anticipated; therefore, improved spacing between turbines needs to be discovered to optimize wind flow. NREL is working with facilities to improve modeling capabilities. In such a dynamic industry, it is necessary to adapt to a changing technology climate.

Wind market trends indicate that as of 2012, the United States was leading with the most annual wind capacity in MW internationally (13,131 MW), with China close behind (12,960). However, in terms of wind as a percentage of energy consumption, the United States is at about 4% compared to Denmark's 28%. Denver receives 30% of its electricity from wind and sometimes up to 100%. A reasonable target for the United States is 30% wind as a percentage of energy consumption.

Driven by the production tax credit (PTC), growth in the wind industry made the United States a leader in wind capacity in 2006. By 2012, when the PTC expired, wind capacity had hit another new record, while the investment tax credit (ITC) had kept capacity afloat in 2010 and 2011. To determine incentives and renewable portfolio standards and policies, check the DSIRE (Database of State Incentives for Renewable Energy & Efficiency) website.

U.S. domestic manufacturing of wind generation technology is relatively recent, but grew after 3 years of the PTC. Before that the needed infrastructure and manufacturing capacity were not in place here. Currently there are more than 160 manufacturing plants, together capable of 12 GW/yr. In Colorado more than 1,000 MW of new wind power has been added. The project development, turbine and supply chain impacts, and construction activity have all created new jobs and brought millions of dollars a year into local economies.

New wind technologies will continue to improve the efficiency and economic feasibility of wind turbines. The industry is on the path to creating larger rotors and hubs and larger tower heights to increase wind power for high wind speeds. New wind resource mapping is also beginning to show that wind may be cost effective in areas previously disregarded, such as the Southeast United States.

Beth Chacon reported that Xcel Energy provides gas and electric services to eight states and is the nation's number one wind provider, and 5<sup>th</sup> for solar energy. Twenty percent of energy provided to Xcel

customers is wind power, which is about 5 times the national average. Xcel Energy has acquired wind energy at a very cost-effective price, making it an economically sound choice. By next year, the company expects to be using more than 25% renewable energy. This has currently put them on track to a 35% reduction in greenhouse gas emissions.

The concept of SolarTAC (the Solar Technology Acceleration Center) came out of a need for more solar energy. Xcel Energy is the original founding member supporting the concept, and SundEdison and Abengoa are also original founding members who helped to develop the framework of SolarTAC and will be among the first companies to take advantage of the site. The concept became a reality in 2008, with the center currently being the largest facility in the United States for solar demonstrations. The facility provides a real-world testing environment, leading in developing an understanding how technologies adapt to high/low temperatures. SolarTAC also focuses on fine-tuning nearly commercial technologies, demonstrating reliability and optimizing performance. Companies find this information critical in securing financial backing.

Currently, SolarTAC includes 74 acres in operation with flat, graded topography and an expansion to 200+ acres expected. The site, located near the Denver International Airport, offers excellent insolation conditions and receives more than 300 days of sunshine a year. Around \$30 million has been invested in the site, which will include facilities that are testing both photovoltaic and concentrating solar power technologies. The facility will provide access to grid interconnections. Members of SolarTAC have the option to sponsor proprietary research (results of which are not shared), or common research (results of which are shared with other SolarTAC members), and broad categories of research which are shared with the public.

Xcel Energy integration research includes many proponents that will address challenges and the advancement of new technologies. Solar-to-battery research, community energy storage, and a smart inverter project all fall under the umbrella of Xcel integration research. Use of battery storage, such as for managing integration issues and voltage fluctuation, is a key focus of SolarTAC.

To review Mr. Robichaud's and Ms. Chacon's presentations visit:

[http://energy.gov/sites/prod/files/2014/01/f7/fupwg\\_winter2014\\_robichaud.pdf](http://energy.gov/sites/prod/files/2014/01/f7/fupwg_winter2014_robichaud.pdf)

[http://energy.gov/sites/prod/files/2014/06/f16/fupwg\\_winter2014\\_chacon.pdf](http://energy.gov/sites/prod/files/2014/06/f16/fupwg_winter2014_chacon.pdf)

### **Strategies for Obtaining Net Zero Energy Building**

*Shanti Pless, Senior Energy Efficiency Research Engineer, National Renewable Energy Laboratory*

*Sam Booth, National Renewable Energy Laboratory*

As of 2013 there were around 140 net-zero-energy buildings (NZEBS) in 36 states. Residential- and commercial-scale projects are currently in progress, though net-zero-energy projects can be done at any scale. Current key players driving net-zero energy are the Living Building Challenge, a task force in Massachusetts, a pilot program for Pacific Gas & Electric (PG&E), a campus-wide initiative at the University of California, and a working group for GSA.

Executive Order 13514 directs agencies to "...implement high performance sustainable Federal building design, construction, operation and management, maintenance, and deconstruction including by: (i) beginning in 2020 and thereafter, ensuring that all new Federal buildings that enter the planning process are designed to achieve zero-net-- energy by 2030 ..." (Sec. 2. Goals for Agencies. (g)(i)). Many federal facilities have achieved net-zero energy, including NREL's Research Support Facility and the Wayne Aspinall Federal Building. Historic buildings (such as Wayne Aspinall) will face greater challenges to achieve net zero and will require retrofitting.

Net-zero energy is appropriate for all scales. Campuses are beginning to become involved in the process, with net zero by 2020 being the goal of the NREL campus. All new facilities will be net zero, including high- and low-load facilities. Old facilities will be retrofitted, with continuous control improvements to labs and lighting upgrades from T-12 to LED. In conjunction with achieving this goal, large-scale campus-wide

renewables such as wind and solar will be used. At a campus scale, costs can be reduced through economies of scale. For example, the dollar/watt price for PV will be significantly less when procured in greater volume.

Part of the net-zero-campus effort at NREL is the development of a net-zero-campus energy model. This will be an integrated model for buildings, electrical transportation, a thermal district system, and electrical distribution systems. Organization wide involvement and continuous communication about NZEB distinction has been a big factor in the change that needed to happen at NREL in order to begin working towards their goal. Another important step in the process will be the education of occupants and community outreach. Change in personnel involved was needed as well to get online with the net-zero effort. Senior managers, contracting officers, project managers, building occupants, food services and others all need to be on-board with the effort.

Case studies have shown that NZEBs can be procured with a 0–10% premium on typical construction costs. Net zero is an operational goal, and can be tracked from beginning to end of building life. The payback period expected for higher modeled premiums is generally around 12 – 15 years. Based on results from case studies and NREL’s experience with NZEBs, it is possible for a project team to make decisions that will lower the bounds of the initial capital cost. Some techniques are selecting energy efficiency as a project priority, integrating simple and passive efficiency strategies, downsizing or eliminating heating, ventilation, and air conditioning (HVAC) equipment based on passive envelope design, specifying readily available and tested technology, implementing experimental strategies only when necessary, and maximizing the use of modular and repeatable design strategies.

To review the presentations from this session visit:

[http://energy.gov/sites/prod/files/2014/01/f7/fupwg\\_winter2014\\_pless.pdf](http://energy.gov/sites/prod/files/2014/01/f7/fupwg_winter2014_pless.pdf)

[http://energy.gov/sites/prod/files/2014/01/f7/fupwg\\_winter2014\\_booth\\_0.pdf](http://energy.gov/sites/prod/files/2014/01/f7/fupwg_winter2014_booth_0.pdf)

### **UESC Best Practices Discussion**

*Deb Vasquez, Senior Project Leader, National Renewable Energy Laboratory*

Deb Vasquez introduced John Hickey (Coast Guard), Karen Thomas (NREL) and Pam Komer (VA) as the panelists for this session. The following UESC best practice topics were discussed.

- Engaging Utilities – Agencies must provide fair opportunity to be considered to all eligible natural gas, electric, and water utilities that provide service to the site.
- Rebates and Incentives – Each serving utility can help agencies identify potential incentives and rebates. EISA Section 516 states that agencies can retain the full amount of savings obtained from utility incentive programs. Attendees shared information on how their agencies capture and keep rebates and incentives.
- Contingency Funds for Installation Phase (Escrow Account) – The group discussed how several agencies are now including escrow accounts for final design and construction phase contingencies in their UESC project negotiations. The dollar amount depends on specific project factors/issues such as size, complexity, design completion and site considerations. Contracting Officers appreciate the assurances that contingency escrow accounts offer if suitable parameters are agreed to in advance, such as the following:
  1. Specific purpose of the account and uses for funds
  2. Process for requesting, approving, and tracking the use of funds
  3. Establishing the use and distribution of post-acceptance balance of funds.

It is clear from project successes with contingency accounts that (1) building in requirements, (2) considering strategies that support the project and the stakeholders (win-win), and (3) patient negotiations can pay off.

To review the presentations from this session visit:

[http://energy.gov/sites/prod/files/2014/01/f7/fupwg\\_winter2014\\_vasquez.pdf](http://energy.gov/sites/prod/files/2014/01/f7/fupwg_winter2014_vasquez.pdf)

## **ENERGY LAWYERS AND CONTRACTING OFFICERS WORKING GROUP**

*Facilitators: Linda Collins, GSA, and Julia Kelley, Oak Ridge National Laboratory*

### **Armed Services Board of Contract Appeals (ASBCA) Ruling on the Sale of Renewable Energy Credits (RECS) from Government-Owned Projects**

*Karen White, Staff Attorney, US Air Force*

*Richard Butterworth, Senior Assistant General Counsel, General Services Administration*

*Chris Calamita, Program Counsel to the Office of Energy Efficiency and Renewable Energy, Department of Energy*

*Margaret Simmons, Counsel to Huntsville Center, US Army Corps of Engineers*

Karen White began the discussion by providing some background information on the Honeywell case.

- In July 2008, Fort Dix awarded a Delivery Order (DO) under the DOE “Super ESPC.”
- The DO included installation of a solar array (“Phase I”).
- Modification 01 (18 Sep 08) characterized the Solar RECs (SRECs) as “savings” and fixed the price at \$0.3825/kwh for “at least 5 years.”
- In March 2009 the Army contracting officer requested that Honeywell “facilitate” sales of the SRECs generated by the first array and authorized a 10% “management fee” for such actions.
- Modification 04 (2009) added additional solar arrays, and anticipated “savings” from the SRECs of \$0.405/kwh for first five years, followed by “savings” of \$0.20205/kwh for years six through ten. (“Phase II”).
- On Oct 1, 2009, administrative authority for Fort Dix transferred to Department of Air Force, as part of Joint Base McGuire Dix Lakehurst (JBMDL).
- Prior to transfer, payment was made by Army for Phase I array.
- The Phase II array was completed in 2010 and questions were raised about interconnection with the Utility Law Field Support Center (ULFSC), a branch of the Air Force Legal Operations Agency.
- At this point, the SRECs sales issue was discovered in addition to interconnection questions.
- ULFSC issued a legal opinion that the SREC sale was impermissible, jeopardizing the financial basis of solar array ECMs.
- The contracting officer began negotiation with Honeywell to remedy the illegal provision; Honeywell subsequently filed claim and appeal.

Ms. White then discussed how the ULFSC concern focused on SREC sale requirement.

- SRECs are personal property which belong to the government if arrays transfer to the government.
- Property disposal regulations govern disposition of personal property.
- Ms. White reported that the Air Force position was that DO provisions involving sale of SRECs were invalid.

Chris Calamita defined “energy savings” as a reduction in the cost of energy, water, or wastewater treatment, from a base cost established through a methodology set forth in the contract. The statutory definition does not foreclose “net” considerations e.g., benefits that are a direct result from an energy conservation measure that are used to reduce the cost of energy, water, or wastewater. When this opinion came out DOE was not too concerned. These issues could be avoided in the future if the ESCO maintained ownership of the renewable energy generating equipment so the RECs would be issued to the ESCO and the price of electricity paid by the agency would reflect the value of the REC.

New complications come into play with the 2012 OMB Memorandum on scoring ESPCs that include renewable power generation. The memo states: “For an ESPC or UESC that includes *onsite energy generation* to be scored on an annual basis under this memorandum and M-98-13, the Federal government must retain title to the installed capital goods at the conclusion of the contract.”

Richard Butterworth provided a snapshot of what GSA has been doing in the ESPC area and reported that they have not run into a situation like the Honeywell case because GSA deals are not structured that



way. The ASBCA opinion generally does not have a direct impact on GSA because GSA does not provide for the sale of RECs in the contract. Mr. Butterworth then discussed 40 USC 592(d) and 40 USC 592 (f), which relate to the receipt of rebates and incentives.

Margaret Simmonds continued the discussion regarding Honeywell ASBCA 57779 and reported that the board determined that RECs and/or SRECs are government-owned personal property. The Board also determined that only GSA has the authority to sell Government-owned personal property. The ruling was not specific to DOD. Ms. Simmonds expressed concern that rules and guidance regarding UESCs are difficult to find. She presented some key questions to consider for future projects.

- Is equipment personal property?
- Are solar arrays personal property?
- When do these become “Government owned?”
- What ability is there to define when ownership occurs within the contract?
- If these are not Government-owned until the end of the contract term, could they be sold?

The panel agrees that barriers exist which make it difficult for agencies to meet their renewable goals. David McAndrew mentioned that it is FEMP’s role to help compile and communicate these barriers to OMB.

### **Federal Contracting and Interconnection Agreements – Panel Discussion**

*Bill Eisele, Business Manager, South Carolina Electric and Gas Company*

*Linda Collins, Director of Natural Gas Acquisition Program and a Contracting Officer for the Energy Division, General Services Administration*

Bill Eisele reported that interconnection agreements from the utility perspective are really about safety. Any time a customer has a source of generation that has the potential to flow back to the utility, the utility is going to want to have a discussion with that customer and possibly enter into some type of interconnection agreement.

Linda Collins discussed the problems that agencies have had in the past related to signing utility interconnection agreements because of all the liability and language that they include. She said that FAR Part 41 states that the Federal Government will take utility service which does include interconnection agreements in the courts of state law. Modifications were done to the areawide contracts which incorporated Exhibit D, which allows the Federal government to incorporate the interconnection agreement into areawide contracts. As we go forward, this would be a standard exhibit in areawide contracts which should help agencies deal with issues relating to interconnection agreements. The panel recommends that agencies review the interconnection agreement prior to signing off on a project so that everyone is on the same page regarding these issues.

## Appendix A 2014 Winter FUPWG Seminar – Final Attendee List

Christopher	Abbuehl	Constellation
Steven	Allenby	Allenby Associates, LLC
Ed	Anderson	FPL
Dan E.	Arvizu	National Renewable Energy Laboratory
John	Avina	Abraxas Energy Consulting, LLC
Farhad	Banisadr	Los Alamos National Laboratory
Anneliesa	Barta	Versar, Inc.
David	Base	Chevron
Gene	Beck	FPL
Barbara	Bird	NORESO
Andrew	Bond	Siemens Industries, Inc.
Sam	Booth	NREL
Steve	Bossart	National Energy Technology Laboratory
Sterling	Bowen	PowerSecure
Melanie	Braddock	U.S. Army Corps of Engineers, Huntsville Center
Michele	Brady	Chevron Energy Solutions
Charlie	Brewer	McLean Engineering Company, Inc.
Sean	Brownson	Department of Defense
David	Brueck	Hannah Solar Government Services
Scott	Burke	NIST
Dennis	Burke	Dominion Federal Corporation
Kari	Burman	NREL
Nathan	Butler	SunEdison
Stephen	Butterworth	Pacific Northwest National Laboratory
Chris	Calamita	US DOE
Lincoln	Capstick	Department of Veterans Affairs (VA)
Beth	Chacon	Xcel Energy
Toby	Chandler	AGL Energy Services
Donald	Chung	NREL
Bud	Clark	American Electric Power
Alex	Colby	US Air Force
Nancy	Coleal	USAF Civil Engineer Center
Linda	Collins	U.S. General Services Administration
Phillip	Consiglio	Southern California Edison
Christopher	Cook	CCI Alliance.com
Dave	Corbus	NREL
Susan	Courtney	Energetics, Inc.
Ken	Cowan	NRG Energy Inc.
Matt	Croshal	URS Corp
Doug	Dahle	NREL
Jerome	Davis	Public Service Company of Colorado
Martin	Davis	Philips
Jerry	De Boer	AEP Energy
John	Dierkes	Schneider Electric
Doug	Dixon	Pacific Northwest National Laboratory
E. W.	Dovel	Harris Lighting
John	Dukes	Constellation NewEnergy Inc.
Toni	Egan	TD Equipment Finance
Bill	Eisele	SCE&G

Michael	Ellis	AGL Resources
Tim	Ellis	Western Area Power Administration
Lisa	Estlow	Chevron Energy Solutions
Aaron	Fielder	Booz Allen Hamilton
Marilyn	Fine	Noresco
Richard (Mike)	Fleming	San Diego Gas & Electric
Peter	Flynn	Bostonia
Susan	Force	DOI/NPS
Scott	Foster	FS
Scott	Foster	Hannon Armstrong Sustainable Infrastructure
Steve	Ganzer	SEE Solutions, LLC
Patricia	Gardner Young	NRG Energy
John	Garnett	PG&E
Bobbi	Garrett	National Renewable Energy Laboratory
Lara	Gast	Department of Veterans Affairs
Jessica	Georgescu	Siemens
Karen	Gierhart	Banc of America Public Capital Corp
Chris	Gillis	Pacific Gas & Electric Co.
Bathsheba	Gilmore-Turnage	Southland Energy/Southland Industries
Julieta	Giraldez	NREL
Eric	Goelzer	AGEISS, Inc.
Timothy	Greenwood	Department of Defense
Vicenta	Guerin	con edison
Timothy	Haas	Department of Defense
Glenn	Hahn	SPIRAX SARCO
Bryan	Hannegan	National Renewable Energy Lab
Tom	Harris	National Renewable Energy Laboratory
John	Hickey	Jacobs
Michella	Hill	Dept of Energy
Mark	Hillman	FPL
JP	Hoffman	Siemens
Jim	Holton	Georgia Power / Southern Company
Joe	Holton	Canoochee EMC
Chris	Hood	Gulf Power
Dave	Hopkins	540 Energy Group
Dave	Howe	Retired US Air Force
Michael	Huber	Bonneville Power Administration
Carl	Hurst	Philips
George	Imel	PowerSecure
Darcy	Immerman	AECOM
Marc	Jeanson	AECOM
Adeitra	Jimmison	Dept. of Veteran Affairs
Kevin	Johnson	Vectren - Energy Systems Group
Catherine	Johnson	Department of Veterans Affairs
Robert	Johnson	Hannon Armstrong
Jay	Johnson	Chevron Energy Solutions
Jack	Kavanagh	Utility Systems Solutions, Inc.
Grant	Keath	Ameresco, Inc.
Julia	Kelley	Oak Ridge National Laboratory
Steve	Kiesner	Edison Electric Institute
Frank	Kinder	Colorado Springs Utilities

Linda	Koman	General Services Administration
Pamela	Komer	Veterans Health Administration
Art	Kwerneland	Xcel Energy
Wayne	Latham	Dept of Energy
Jon	Lewis	Honeywell
Eric	Llewellyn	San Diego Gas & Electric
Tracy	Logan	DOE FEMP
Robert	Loop	Marine Corps Support Facility Blount Island
Jesse	Maestas	Schneider Electric
Mark	Mahoney	Army
Kazi	Mamun	Eaton Corporation
Randy	Manion	Western Area Power Administration
Paul	Matthews	Dominion Virginia Power
John	McAllister	Eaton Energy Solutions
David	McAndrew	FEMP
Matthew	McCann	Office of Secretary of Defense
James	Mccarty	Philips
Maryanne	McGowan	Duke Energy
Spencer	Mead	SCITOR
Jack	Menninger	Siemens
Josh	Mersfelder	Hannon Armstrong Sustainable Infrastructure
Scott	Michaelson	Dayton Power & Light
Bradley	Miller	Bonneville Power Administration
Chris	Mills	Energy Systems Group
Annika	Moman	AECOM
Jonathan	Mool	H2O Applied Technologies
King	Moon	NORESO
Daryl	Moore	540 Energy Group
Maggie	Morris	TD Equipment Finance
Andrew	Morton	Johnson Controls
Kevin	Moyers	Scitor
Christina	Mudd	Exeter Associates
Kim	Mueller	Dominion
Steve	Mullen	Western Area Power Administration
Patricia	Nardone	Georgia Power
Gary	Nemmers	Department of Defense
Jeff	Niesz	Pepco Energy Services
Karma	Nilsson	CPS Energy
Michael	Norton	US Army Corps of Engineers, Huntsville Engineering Center
Eric	Nyenhuis	AECOM
Alice	Oberhausen	Alice Oberhausen Consulting
Kelly	O'Neill	Versar, Inc.
Ken	Ormsbee	Chevron
Justin	O'Rourke	Veterans Health Administration
Matthew	Patterson	Naval Facilities Engineering Command, Hawaii
Plate	Peggy	Western Area Power Administration
Charlie	Pickett	US2
Joe	Pierzina	SDG&E
Gerry	Place	Johnson Controls, Inc.
Shanti	Pless	National Renewable Energy Laboratory (NREL)
Keith	Polmanteer	Southern California Gas Company
David	Powell	NAVFAC
David	Powers	FAA

Joseph	Price	Ameresco
Mike	Pries	Federal Reserve Bank
Ray	Prosise	Spirax Sarco
Scott	Provinse	SunEdison
Kamisha	Quates	Southern Company
Baron	Rabe	SMITH/Associates
Craig	Raddatz	United Financial of Illinois
Anthony	Raimondo	Southwest Gas Corporation
Teri	Rainville-Scott	Baltimore Gas & Electric
Smidt	Randall	US Army
Kaila	Raybuck	Energetics Incorporated
Richard	Butterworth	General Services Administration
Lizette	Richardson	National Park Service - WASO Denver
David	Roberts	Cypress Envirosystems
Robi	Robichaud	National Renewable Energy Laboratory
Gerald	Robinson	Lawrence Berkeley National Laboratory
Dave	Robinson	Honeywell
Adrian	Rodriguez	El Paso Electric Company
Valentino	Rosas	Veterans Health Administration
Doug	Rothgeb	General Service Administration
Matthew	Rush	Chevron
Tommy	Sailors	Marine Corps Support Facility
Chris	Saiz	PG&E
Elton	Saxton	OG&E
Schuyler	Schell	DOE/EERE/FEMP
Jonathan	Schmidt	Department of Defense
Scott	Seigel	Siemens
Chandra	Shah	NREL
John	Shea	The Arcanum Group
Derek	Shockley	Xcel Energy
Matthew	Short	Southland Energy
David	Shutler	Utility Systems Solutions, Inc.
Christopher	Silkie	Cardno TEC, Inc.
Margaret	Simmons	US Army Corps of Engineers
Marty	Skolnick	Siemens Industry, Inc
Brant	Small	Lutron Electronics
James	Smith	PowerSecure, Inc.
Robert	Somers II	2rw Consultants, Inc.
Anthony	Spera	Con Edison Solutions
Emily	Stoddart	Department of Energy
Chuck	Strand	Enervault Corporation
Martha	Symko-Davies	National Renewable Energy Lab
Ralph	Tatum	Dominion
Michael	Taylor	American Electric Power
Ralph	Terrell	TECO Peoples Gas
Wayne	Thalasinios	NASA
Edward	Thibodo	Silver Wolf Consulting
Karen	Thomas	NREL
Carrie	Thomas	Energy Systems Group
Nello	Tortora	Soutland Energy
Oanh	Tran	Energy Systems Group
Johan	Ulloa	Constellation
Brendon	Van Campen	Lutron Electronics
Deb	Vasquez	NREL

Kevin	Vaughn	Schneider Electric
Dan	Vesey	Schneider Electric
Michelle	Ward	Pacific Gas and Electric Company
Mike	Warwick	Pacific Northwest Lab
William	Waugaman	NORAD & USNORTHCOM
Robert	Welch	Energy Crafters
Robert	Westby	NREL
Francis	Wheeler	Water Savers, LLC.
Chris	Wheeler	Powersmiths Corporation
Karen	White	USAF
Kelsey	Williams	Westar Energy
Reginald	Williams	Veterans Health Administration
L. Daryl	Williams	Tennessee Valley Authority
Brigitte	Wilson	Chevron Energy Solutions
Scott	Wolf	DOE FEMP/NW tech
Richard	Woo	Powersmiths International Corp



**Appendix B  
2013 Fall FUPWG Agenda**

**Federal Utility Partnership Working Group Seminar  
January 14-15, 2014  
Golden, CO**



**Monday, January 13**

1:30-3:30pm - #1	Tours of NREL Energy Systems Integration Facility (ESIF)
2:30-4:30pm - #2	
5:00pm – 6:30pm	FUPWG Steering Committee Meeting
7:30pm	Informal FUPWG Networking – Copper Creek (Marriott)

**Tuesday, January 14**

7:45am	Registration and Continental Breakfast
8:30am	Welcome – Jerome Davis, Xcel Energy
8:45am	DOE/FEMP Welcome and Announcements – David McAndrew, DOE FEMP
9:00am	Washington Update – Skye Schell, DOE FEMP
9:30am	National Renewable Energy Laboratory Overview – Bobi Garrett, NREL
10:00am	Networking Break
10:30am	Energy Systems Integration – Bryan Hannegan, NREL
11:00am	<b>Energy Reliability in a Changing Landscape</b> <ul style="list-style-type: none"> <li>▪ Julieta Giraldez, NREL</li> <li>▪ Steve Kiesner, Edison Electric Institute</li> <li>▪ Bill Eisele, South Carolina Electric and Gas</li> <li>▪ Dave Corbus, NREL</li> </ul>
12:00pm	Lunch - Dr. Dan Arvizu, Director of NREL
1:30pm	Xcel Energy Programs, Services and Successes – Derek Shockley, Xcel Energy
2:15pm	<b>Case Study: Colorado Springs Utilities/ Fort Carson</b> <ul style="list-style-type: none"> <li>▪ Frank Kinder, Colorado Springs Utilities (invited)</li> <li>▪ Mark Mahoney, Army Regional Environmental and Energy Office</li> </ul>
3:00pm	Networking Break
3:30pm	Update on Smart Power Infrastructure Demonstration for Energy Reliability and Security (SPIDERS) – Bill Waugaman, U.S. Northern Command
4:20pm	Wrap-up – David McAndrew, DOE FEMP
6:00 – 7:30pm	Networking Event - Denver Marriott West

**Wednesday, January 15**

7:45am	Continental Breakfast
8:30am	Announcements – David McAndrew, DOE FEMP

8:35am	<b>Disaster Relief Appropriations Act</b> – Lizette Richardson and Richard Turk, National Park Service
9:00am	<b>Renewable Energy Panel – National Wind Technology Center and SolarTac Technology Acceleration Center</b> <ul style="list-style-type: none"> <li>▪ Robi Robichaud, NREL National Wind Technology Center</li> <li>▪ Beth Chacon, Xcel Energy</li> </ul>
10:00am	<b>Networking Break</b>
10:30am	<b>Strategies for Obtaining Net Zero Energy Building</b> <ul style="list-style-type: none"> <li>▪ Shanti Pless, NREL</li> <li>▪ Sam Booth, NREL</li> </ul>
11:15am	<b>UESC Best Practices Discussion</b> – Deb Vasquez, NREL
11:45am	<b>Evaluations and Wrap-up</b> – David McAndrew, DOE FEMP
Noon	<b>Lunch On Your Own</b>
1:30-3:30pm - #3	<b>Tours of NREL Energy Systems Integration Facility (ESIF)</b>

## Special Session: Wednesday, January 15 Energy Lawyers and Contracting Officers Working Group

Facilitators: Linda Collins, GSA and Julia Kelley, ORNL

1:00pm	<b>Announcements and Introductions</b> - Linda Collins (GSA) and Julia Kelley (ORNL), FEMP Utility Team
1:05 - 2:05pm	<b>ASBCA Ruling on the Sale of RECS from Government Owned Projects</b> <ul style="list-style-type: none"> <li>▪ Karen White, Air Force</li> <li>▪ Richard Butterworth, GSA</li> <li>▪ Chris Calamita, DOE</li> <li>▪ Margaret Simmons, Army</li> </ul>
2:05 – 2:30pm	<b>Federal Contracting and Interconnection Agreements Panel Discussion</b> <ul style="list-style-type: none"> <li>▪ Bill Eisele, SCE&amp;G</li> <li>▪ Linda Collins, GSA</li> </ul>
2:30pm	<b>Adjourn</b>

## Thursday, January 16 – Friday, January 17

9:00am – 4:30 pm	<b>Advanced UESC Workshop</b>
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### 2014 Spring FUPWG Seminar

May 7-8, 2014  
Virginia Beach, VA

Hosted by:



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