



PUBLIC STAKEHOLDER MEETING #1

U.S. Capitol Visitor Center, 1st & East Capitol Streets, N.E.
Congressional Auditorium
February 4, 2016

Executive Summary

On February 4, 2016, the U.S. Department of Energy's (DOE's) Office of Energy Policy and Systems Analysis (EPSA) hosted the first of seven public stakeholder meetings for the second installment of the *Quadrennial Energy Review* (QER). Approximately 100 people attended in person at the U.S. Capitol Visitor Center, in Washington, D.C.

The focus of the second QER installment is on the electricity sector, from generation through transmission and distribution to end-use. The public stakeholder meetings help to inform the QER analysis and reflect the ideas and advice of states and local governments, tribes, businesses, universities, national laboratories, nongovernmental and labor organizations, consumers, and other external stakeholders.

The meeting began with an overview on the history and significance of the QER by Congressman Earl Blumenauer; White House officials, Dan Utech and John Holdren; and DOE Secretary Ernest Moniz and his energy counselor, Melanie Kenderdine. Two panels of industry experts then focused on the challenges to planning and operating bulk power generation and transmission and managing electricity distribution and end-use in the transforming electricity sector. Panelists discussed issues surrounding market competition, opportunities and challenges resulting from new technologies, the role of the Federal Government in electricity markets, the importance of flexibility, and concerns about prescribing particular generation technologies. Panelists also discussed the increasing array of customer services available as a result of grid modernization, the value these can provide, and the importance of ensuring an affordable electricity supply. The discussion also covered the regional nature of generation and transmission issues along with a wide range of other topics. Following the panel sessions, DOE opened the meeting for public comments.

This summary highlights the insights and discussion from the meeting. Full transcripts and a video of the meeting are available on the [Stakeholder Meetings](#) page on www.energy.gov/QER. Throughout the QER stakeholder input process, comments are also accepted online at www.energy.gov/QER.



Opening Remarks

Panelists:

- Ms. Melanie Kenderdine – Director of the Office of Energy Policy and Systems Analysis
- Congressman Earl Blumenauer – U.S. Representative for Oregon’s 3rd Congressional District (Democrat)
- Dr. John Holdren – Director of the White House Office of Science and Technology Policy and Co-Chair of the President's Council of Advisors on Science and Technology
- Mr. Dan Utech – Deputy Assistant to the President for Energy and Climate Change
- Secretary Ernest Moniz – U.S. Secretary of Energy



Overview:

EPSA Director Melanie Kenderdine opened the first panel by providing a brief overview of the second installment of the QER, which will focus on the entire U.S. electricity system, including modernizing the U.S electricity system to meet our security, economic, and environmental goals. Ms. Kenderdine introduced the opening speakers. Congressman Blumenauer provided brief expository remarks on the QER and a perspective from Capitol Hill. Dr. Holdren, Mr. Utech, and Secretary Moniz provided the history that led to the development of the QER and highlighted key elements of the Obama Administration's energy policy and Climate Action Plan.

Congressman Earl Blumenauer

Congressman Blumenauer’s remarks focused on the QER going from a broader issue in the first installment to a deeper examination of the energy sector in the second installment. Mr. Blumenauer noted that those on Capitol Hill recognize the under-investment in the “nuts and bolts” of the electrical supply system and the challenges the U.S faces in addressing resiliency, capacity, modernization, and research and development.

Dr. John Holdren

Dr. Holdren recounted the history of the QER’s development beginning in the late 1990s. The President’s Council on Advisors on Science and Technology (PCAST) Subcommittee, under the Clinton Administration, produced three studies on energy technology and energy strategy in



1995, 1997, and 1999. In 2010, under the Obama Administration, the PCAST Subcommittee first recommended the QER and the *Quadrennial Technology Review* (QTR). The QTR was published in 2011, and the QER was announced as part of President Obama’s Climate Action Plan in June 2013.

In the intervening 20 years since the first energy studies under the Clinton Administration, Dr. Holdren noted that there have been several major changes in the U.S. energy landscape. In electricity generation, coal consumption has declined by about a fifth, while the use of natural gas and renewables has grown considerably. Since 2008, the amount of electricity generated by wind power has more than tripled and the amount generated by solar energy has increased more than thirtyfold. In electricity end use, lighting based on light emitting diodes (LEDs) was still in its infancy when Congress passed the last major energy bill in 2007. Today, LEDs are ubiquitous and have resulted in huge improvements in energy efficiency in lighting worldwide. In regard to electricity in vehicle transportation, today there are 26 models of plug-in electric cars on the market offered by more than a dozen manufacturers, and we will see vehicles with upwards of 200 miles of range on a single charge. There has also been a global recognition that, as quoting the third national climate assessment, “climate change, once considered an issue for the distant future, has firmly moved into the present.”

In light of these dramatic changes, President Obama has taken a series of significant actions. He worked with Congress to pass the *American Recovery and Reinvestment Act of 2009*, which provided \$80 billion for measures to promote cleaner, more-efficient energy use. These included the first-ever combined fuel economy greenhouse gas (GHG) standards for light-duty vehicles, efficiency standards for residential and commercial appliances, and a 2009 commitment to reduce GHG emissions. These efforts were augmented by President Obama’s June 2013 announcement of his three-pillar National Climate Action Plan. Dr. Holdren detailed specific actions to advance the three main pillars of the plan: reducing domestic GHG emissions through the Clean Power Plan, promoting U.S. resilience and preparedness against climate change through the Administration’s launch of the Climate Data Initiative and the Climate Resilience Tool Kit, and providing international leadership to reduce GHG emissions through commitments made at the Paris Conference of the Parties (COP21) last December.

Mr. Dan Utech

Mr. Utech noted that the U.S has one of the most reliable, affordable, and increasingly clean electricity systems in the world. At the same time, the system is undergoing a transformation that includes the shale gas revolution, the steep reduction in renewable energy costs and increased deployment, and the flattening load growth due to efficiency gains. Mr. Utech remarked on some of the significant events that have occurred within the last six months. These included the Clean Power Plan, which set up a national framework to reduce GHG emissions from the electricity sector; the Paris Agreement, which sent a strong market signal that the world is moving to cleaner sources of energy, both in the U.S. and around the globe; and the renewable electricity production tax credit and investment tax credit passed in Congress. These actions illustrate the clear direction toward lower carbon energy, including, and in particular, in the power sector.

Mr. Utech highlighted several trends, factors, and issues that should be recognized in the second installment of the QER. One point he made was to recognize the importance of increasing



customer interaction with the grid, which requires the U.S. to have a more dynamic electric power system. This consists of a system that can accommodate an increasingly diverse set of resources including central stations, distributed generation, energy storage, and responsive load. New technologies will create opportunities for a more flexible, dynamic, and clean system. Mr. Utech also noted that the grid of the future will include a secure communications network, more precise dispatch of generation, and increased resilience by enabling grid disturbances to “self-heal.” Many of the desired attributes of the future grid are clear, but we still need to chart the path of how to get there. Modernization may require new business models and regulatory approaches while at the same time allowing for innovation technologies and new market structures.

Secretary Ernest Moniz

Secretary of Energy Ernest Moniz reiterated the importance of PCAST, which calls for a whole-government, analytically based approach to energy policy that is foundational for critical dialogues between the Administration, states, international partners, and other stakeholders. Congress has utilized the first installment of the QER as the basis for developing legislation, as evidenced by the Transportation Bill passed last year, which included \$2 billion for modernizing the Strategic Petroleum Reserve, and an energy bill that the Senate is considering. Congress has been very supportive in pursuing the QER first installment recommendations. Secretary Moniz emphasized the importance of stakeholder input to the development of the first QER and noted that it will be critical for the second installment as well. He recognized that stakeholder engagement would have the same impact as the first installment and encouraged people to take the opportunity to engage in the process.

Secretary Moniz framed some of the challenging, complex issues that will comprise the second installment of the QER. These challenges include assuring affordable energy, improving systems performance, protecting against both cyber and physical threats, addressing new technologies, and facilitating consumer connectedness to the grid. Moreover, the QER will assess market, jurisdictional, and regulatory issues and develop recommendations on market and operational structures, which enable the grid of the future.

Secretary Moniz reinforced Dr. Holdren and Mr. Utech’s remarks on the tremendous progress that has been made to advance President Obama’s Climate Agenda. He referenced the Clean Power Plan and the Paris Agreement where 195 nations agreed to reduce emissions. Secretary Moniz also mentioned another essential component of the Climate Agenda—Mission Innovation, which entails a pledge by a coalition of 20 countries to double energy technology research and development over the next five years. Moreover, the Obama Administration has worked in coordination with Bill Gates to put together another coalition called the Breakthrough Energy Coalition, which will lead to the investment of end-to-end marketplace resources to take advantage of the Mission Innovation pipeline. While Secretary Moniz did acknowledge the continued challenges when examining policy, business models, and other services over many decades, he also celebrated the progress made over the past year. He emphasized how much he was looking forward to continuing stakeholder interactions this year.

Question and Answer



Jonathan Canis from Arent Fox Law Firm in Washington, D.C. asked about the impact of the Paris Agreement and the Obama Administration policy on the purchase and pricing of power in the United States.

Dr. Holdren and Mr. Utech responded that the United States not only anticipated the commitment from COP21 but had already been working to reduce emissions since the announcement of the Climate Action Plan in June 2013. Secretary Moniz added that the Clean Power Plan is central to the U.S. commitment in Paris to reduce emissions. He noted that he has not seen a credible scenario for GHG reduction that does not include a major demand-side contribution. Secretary Moniz further stated that reductions will come not only from policies but from technological solutions as well. Innovation and deployment can drive cost reduction. For instance, lighting is a major load, and the 90% reduction in LED costs over the last five to six years has led to significant progress in the past six months in meeting the challenge of deploying 10 billion LEDs globally. In addition, nuclear energy will remain an important component of a reduced-carbon future as will carbon-capture and sequestration technologies. There are relatively low-cost opportunities for capturing carbon from industrial plants that can be implemented in the near term as well. Ms. Kenderdine further elaborated that Mission Innovation meets multiple objectives including clean energy and competitiveness. It is a five-year plan that is committed to clean energy technology and innovation.

Panel 1

Bulk Power Generation and Transmission: How Can We Plan, Build, and Operate the Appropriate Amount for Future Needs?

Panelists:

- Mr. Gerry Cauley – President & CEO, North American Electric Reliability Corporation
- Mr. Tom Kuhn – President, Edison Electric Institute
- Mr. John Shelk – President & CEO, Electric Power Supply Association
- Ms. Sue Kelly – President & CEO, American Public Power Association
- Mr. Jay Morrison – Vice President, Regulatory Issues, National Rural Electric Cooperative Association

Moderator:

- Mr. Chris Kelley – Vice President, Energy Solutions Division, Energetics, Inc.





Mr. Gerry Cauley

Mr. Cauley started his remarks by explaining that the North American Electric Reliability Corporation (NERC) is focused on maintaining reliability while the nation's resource mix transitions and the grid is modernized. He then provided a brief history of the organization from the 1990s and leading up to developing standards for a functional model for operating within an open-access transmission system.

Mr. Cauley highlighted six critical areas for discussion. The first area was essential reliability services, a term NERC is suggesting in place of ancillary services because they are the critical building blocks for reliability and can accommodate large swings in renewable resources, provide voltage control, and manage frequency response. As our system transitions to a distributed energy base, there are changing operating characteristics for the grid that must be acknowledged. In Texas, for example, high levels of wind at certain times cause a loss of inertia since there are few large-mass generating units spinning. Technology does exist today to provide these services, and as an example, PJM has introduced requirements for digital inverters on new renewable resources.

The second area he noted to ensure future grid reliability was adequate transmission lines. There is a growing mismatch between the shorter build timeline of today's gas and renewables additions and the often 8–10 years to build new transmission. The third area was maintaining a focus on continued growth of gas infrastructure and coordination to deliver adequate gas supply during peak cold days and severe times.

Mr. Cauley's fourth imperative was to encourage continued and increased work on cyber and physical security. He highlighted the CEO-level Electricity Subsector Coordinating Council (ESCC) and NERC's Electricity-Information Sharing and Analysis Centers (E-ISAC) as examples of promising work. He also asked the Federal Government to continue declassifying and sharing information that could be actionable by industry operators and owners and to consider working with industry to create a transformer reserve.

Fifth, Mr. Cauley noted the need to address the challenge of integrating controls to accommodate continuing growth of distributed resources and demand response, especially to coordinate controls and support continued bulk power system reliability. The final priority area for Mr. Cauley was to continue a heavy push on storage research. Citing his work as an operator for 35 years, he noted that storage is the most valuable control resource for keeping the grid stable and reliable.

Mr. Tom Kuhn

The Edison Electric Institute's (EEI's) strategic planning efforts focus on maintaining clean, reliable, and affordable electricity in a time of major transformation. EEI is committed to the development of a modern, resilient, and reliable grid. Mr. Kuhn noted that a relatively low number of outages and short restoration times are examples of the benefits of recent industry investments in grid resilience. Utilities' roles will be to continue to serve as the distribution system integrator and to help launch new technologies on the grid to maintain its reliability.



Mr. Kuhn emphasized three key areas of focus. The first was grid modernization, under which he highlighted multiple specific components. He noted that it is important to maintain visibility and operational control to ensure that new distributed generation sources are integrated at a faster pace, that transmission planning has to become more efficient to deal with the new distributed generation sources becoming available, and that siting processes must be improved for the clean energy future envisioned in the Clean Power Plan. The recently enacted electricity provisions of the Transportation Bill, which EEI supported, creates a steering council of Federal Agency environmental review and permitting officers to improve the Federal permitting and siting process.

Mr. Kuhn also noted that it is important to have effective Federal and State partnerships for more coordinated transmission and distribution planning. Compensatory returns on transmission investments continue to be important since long development time lines and public opposition can place transmission development at risk.

Another area of focus on grid modernization is resolving jurisdictional issues in an effort to promote effective Federal and State partnerships. Also, echoing Mr. Cauley's comments, Mr. Kuhn noted that utilities need to partner with the Federal Government to strengthen cyber security. The ESCC, the recent grid security exercise GridEx III that NERC organized, and cyber mutual assistance efforts are key efforts in addressing cyber threats. His second area of improvement is in identifying innovative customer solutions to allow customers the flexibility to control their energy supply, usage, and services.

Mr. Kuhn's third and final point was on the clean energy future. The electric utility industry has focused greatly on promoting the use of clean energy, investing in about 50% of all U.S. solar energy capacity, building vast amounts of wind power, and working with the Administration to develop the Clean Power Plan. Now, EEI plans to work with states and utilities to develop their individual plans. Mr. Kuhn also noted that another part of this clean energy future is maintaining fuel diversity and flexibility to preserve the clean, reliable, and affordable electricity that customers expect.

Mr. Kuhn finished by noting that the electric power industry will need to rely on new technologies, and continuing transformations that will ensure that the electric power can remain clean, safe, and reliable.

Mr. John Shelk

Mr. Shelk focused the majority of his comments on the competitive energy arena rather than the cost-regulated space. He represents the national trade association for competitively owned wholesale electricity generators and suppliers, who currently supply about 40% of the nation's electric generation. More than 90% of these member assets are in (centrally) organized markets with independent operation of the grid (Regional Transmission Organizations [RTOs]/Independent System Operators [ISOs]), in regions where the supply is almost entirely competitively owned.

He commended the second installment of the QER's focus on electricity, particularly given the multi-decade series of changes underway in the power sector. Mr. Shelk provided feedback for



the near term, the medium term, and the longer term. For the near term, he noted that the report should consider critical policy decisions in 2016, 2017, and 2018, which will have an important impact on 2040 goals. As greater distributed resources become available on the market, regulatory and business models should work to accommodate new entrants. He also reiterated two major points that Mr. Cauley made, first on the importance of having a reliable transmission system, and second on providing compensation for building transmission assets.

In Mr. Shelk’s view, competitive markets are the best and most flexible models to manage the challenges and consumer costs in the power sector. However, in order to do so, they require accurate price signals and revenues to recoup their expenditures on new and existing generation sources. As such, he highlighted the importance of making changes to price formation in the RTO/ISO markets, including changes this year. He also called for states with restructured markets to allow markets to work by resisting cost regulation that could distort market prices.

For the medium term, in addition to echoing Mr. Cauley’s comments on essential reliability services, Mr. Shelk also emphasized that the implementation of the Clean Power Plan look to the use of price-based markets.

The tools chosen by policymakers to effect change matter. Mr. Shelk urged policymakers to use market-based approaches, not subsidies and mandates, to foster clean and secure energy. The analysis being performed as part of the QER can help shed light on the best approaches for states and utilities to take in implementing the Clean Power Plan. For example, the existing dispatch model used in regional markets is driven by marginal production costs. This leads into his longer-term feedback in which he noted that the importance of alternatives to dispatch models should be considered, since we now have zero marginal cost wind and solar and compensation is needed to ensure other generation to guarantee reliability remains available. The QER process should include analysis to help evaluate existing models and identify how they could be revised.

Ms. Sue Kelly

Ms. Kelly’s remarks focused on the imperative that state and local entities be able to have a flexible choice for electricity markets rather being subject to Federal regulation. She is the president of the American Public Power Association (APPA) which represents about 2,000 community-owned utilities in 49 States. They each have unique operational and market circumstances specific to the area within which they operate.

Ms. Kelly warned of the negative impact of increased Federal regulation. Federal regulation imposed upon the entire electric power sector could have unintended consequences and adverse impacts. Community-owned utilities believe local control of utilities and maintaining community-level decision making on energy issues are of the utmost importance; increased Federal regulation can have adverse impacts on public power by reducing choices and imposing new mandates, thus increasing costs. The Federal Government should assist the industry by supporting new technological advances, but it should not be in the business of selecting favored business models or technologies. She noted that not-for-profit public power utilities care about the “three-legged stool” — affordability, reliability, and environmental stewardship. If any one of those gets out of whack, customers suffer.



Additionally, public power utilities are fully committed to enhancing their cyber and physical security, and Ms. Kelly noted that APPA is helping members develop an “all hazards” approach to security, disaster preparation, and response. While APPA supports the enhanced dialogue between the industry and Federal Government on security threats and potential responses, it does not support Federal mandates at the distribution level.

Ms. Kelly also discussed three issues of importance to the public power community that she hopes the QER’s second installment can address — flaws in mandatory capacity markets in organized wholesale power markets, the Clean Power Plan, and the impact of the increasing role of demand-side resources. Mandatory capacity markets operated by regional transmission organizations are increasingly showing that they are unable to support the development and maintenance of a lower carbon resource portfolio at a reasonable price. These markets were not designed to support the optimal mix of resources to help reduce carbon intensity, promote fuel diversity, provide ancillary services, and coordinate natural gas infrastructure with electric infrastructure. Indeed, she noted that an appropriate Federal role could be to support research, development, and dissemination of the broad array of tools and technologies to help state and local governments and utilities make informed decisions.

Ms. Kelly noted that the Clean Power Plan, while a definite improvement over the proposed rule, still tries to do too much too fast for public power utilities and their customers in many states. If implemented as the U.S. Environmental Protection Agency (EPA) finalized it, the Clean Power Plan has high potential to create stranded costs and curtail the remaining useful life of existing electric-generating units, increase operating costs, add new infrastructure costs, and raise electricity bills for millions of consumers. APPA has asked the U.S. Court of Appeals for the District of Columbia Circuit to review the rule and, at the same time, has submitted extensive comments to EPA on its proposed Federal plan and model-trading rules. It’s going to be extremely important to public power that any Clean Power Plan trading regime actually work. We have to be able to maintain that three-legged stool of reliability, affordability, and environmental stewardship.

Ms. Kelly also spoke about the large role that distributed energy resources play in compliance with the Clean Power Plan. Community solar and energy efficiency both make good sense for APPA members given that its members are organized at the community level. However, these decisions need to be made at the community level rather than as a one-size-fits-all Federal approach.

Mr. Jay Morrison

The National Rural Electric Cooperative Association (NRECA) represents the consumer-owned, consumer-governed, nonprofit sector of the industry. While NRECA accounts for only about 12% of the load, it serves 75% of the U.S. land mass, often in very poor areas. NRECA owns or operates about 42% of the distribution system in the country.

Mr. Morrison highlighted the three most pressing challenges currently confronting NRECA’s members. First, he asked for DOE’s help in implementing the Clean Power Plan in a flexible manner that preserves the reliability and affordability of power for all consumers. Secondly, he expressed hope that the QER 1.2 will recognize the extraordinary uncertainty that the Clean



Power Plan and other changes taking place in the industry impose on states, utilities, and consumers. Mr. Morrison reiterated the concern Mr. Cauley, Mr. Kuhn, and Mr. Shelk had voiced about the capacity for the transmission system to keep pace with the unfolding transitions. He joined Mr. Shelk and Ms. Kelly in voicing support for local decision-making bodies as they are best positioned to mitigate risk. It is simply unclear what new generation, transmission, and infrastructure the industry will require, when and where it will be needed, how long these investments will continue to be used and useful, who will benefit from these investments, who will pay for them, or how much they will cost. Lastly, Mr. Morrison noted how essential it is that regulatory systems and market structures enable load-serving entities, like cooperatives, the flexibility to make local decisions that allow them to optimize a diverse portfolio of resources, including generation, transmission, distribution, and demand-side resources on behalf of their consumers in light of local conditions and their local consumers' preferences.

As NRECA works hard to identify the tools that will allow for the maximum integration of distributed energy resources, Mr. Morrison stressed the need for the flexibility, timing, and freedom to make the best choices for providing NRECA's members with safe, reliable, and affordable power into the future.

Question and Answer (Note: All questions asked by the moderator, Chris Kelley):

Question 1: Can you comment a bit more on the value or importance of resource diversity?

All of the panelists underscored the importance of resource diversity. This diversity means that all sources—coal, nuclear, natural gas, renewables—should be valued. Mr. Morrison and Ms. Kelly warned against “[running] to one side of the boat” by favoring a single asset at any given time. Mr. Cauley stated that fuel diversity has a direct correlation to reliability and should be valued as such.

Question 2: While generation capacity continues to increase substantially, the process for implementing transmission remains lengthy, so you have the QER Task Force here before you. What recommendations or suggestions might you have for this group?

Mr. Cauley commented that generation and transmission are becoming more disconnected. We can grow generation, but building transmission is much more challenging.

Ms. Kelly stated that the goal should be to create a foundation for transmission that can be built upon. She noted that while transmission is a very expensive asset, it is very lucrative if investors have the cash flow to build it. As such, it is important to consider whether transmission is being proposed because it is really needed, or because it is regulated and a good investment.

Mr. Shelk advocated for regional coordination and operation of the grid so that states are not going it alone. Also, he noted a concern for the “not in my backyard” argument, which affects not only transmission but all infrastructure that makes up the grid.

Mr. Morrison stated that the challenge lies mostly in the construction of high-voltage, longer-range transport lines. He separately outlined questions facing the integration of distributed



generation. Will generation sources be distributed across long distances or within local regions, and which one is the most cost-effective way forward?

Question 3: I took note of a concept that was new to me, and that was mutual aid for cyber security. What is your sense or your members' sense on whether enough is being done?

All panelists highlighted good cooperation in the area of cyber security. Two panelists lauded NERC's cybersecurity initiatives, specifically their efforts to bolster E-ISAC and convene the GridEx III exercise. Panelists pointed out that more needs to be done in terms of cybersecurity. More tools are needed to address the threat, which continues to grow by leaps and bounds.

Question 4: Highlight a key point that you'd like to leave the QER Task Force with.

Panelists all praised the analytical approach of the QER. Mr. Shelk reiterated that 40% of the generating fleet is on a market basis, and the competitive community embraces the technological changes that have been discussed. There is a lot of potential. That said, Mr. Shelk notes, "It is really in the interest of those who want that new future to arrive in a way that's economically efficient and environmentally responsible and most of all, has public acceptance." Mr. Cauley repeated his top-line priority of essential reliability services, which are becoming scarcer.

Panel 2

Electricity Distribution and End-Use: How Do We Manage Challenges and Opportunities?

Speakers:

- Mr. Steve Nadel – Executive Director, American Council for an Energy Efficient Economy
- Mr. Tom Kimbis – General Counsel & Vice President of Executive Affairs, Solar Energy Industries Association
- Ms. Lisa Wood – Vice President, Edison Foundation and Executive Director, Institute for Electric Innovation
- Mr. David Springe – Executive Director, National Association of State Utility Consumer Advocates
- Mr. Robert Powelson – Commissioner, Pennsylvania Public Utility Commission and First Vice President, National Association of Regulatory Utility Commissioners

Moderator:

- Mr. Chris Kelley – Vice President, Energy Solutions Division, Energetics, Inc.



Mr. Steve Nadel

The American Council for an Energy Efficient Economy (ACEEE) has promoted energy efficiency savings for the past 35 years through a range of programs, policies, and market interventions. Mr. Nadel described energy efficiency as “the low-cost utility system resource.” Mr. Nadel provided a chart of Energy Information Administration data that showed the incremental measures of savings from each year, which account for 0.7% savings per year. ACEEE, in its New Horizons for Energy Efficiency study, projects a case that could lead to an additional 22% reduction in energy use by 2030. Mr. Nadel noted that, in addition to saving energy, energy efficiency measures provide non-energy benefits, such as increasing property value; reducing maintenance for single-family homes; and improving public image, health, safety, and satisfaction in businesses.

Mr. Nadel highlighted the opportunity to use energy efficiency as part of distribution system planning. While energy efficiency is often considered to be on the generation side, it also can reduce loads on particular distribution circuits that are becoming overburdened.

In today’s changing utility industry, Mr. Nadel noted the significant role for utility value-added services, whether they be energy efficiency, electric vehicles, some of the larger distributed generation systems, combined heat and power systems, or community solar. He specifically highlighted the efficiency of electric vehicles and heat pumps as ways to cut energy use.

Mr. Nadel noted the challenge in decoupling energy use and gross domestic product (GDP) as energy efficiency accelerates. This means that we need to be careful not to overbuild and overinvest, and energy efficiency can be an important part of that solution.

Mr. Tom Kimbis

The Solar Energy Industry Association (SEIA) is the national trade association for the solar industry within the United States representing about 1,000 companies and now over 200,000 American workers. DOE helped shape the key energy legislation that went into effect to promote solar energy 20–25 years ago. Today, very little is similar to what existed in 1992. Mr. Kimbis noted that solar is no longer a distant hope, but a clean, reliable, affordable electricity choice for Americans today. While solar, natural gas, and wind accounted for most of the new generating capacity in the United States in the last year, solar is still only 1% of the electricity mix in America.



Mr. Kimbis emphasized two major themes: education for consumers, policymakers, and utility executives on solar energy; and the interface with existing infrastructure. There are different issues facing utility-scale solar and distributed generation solar. On the utility scale, he noted that it is important for states to understand solar characteristics, including what it can do and what it cannot do as an intermittent generation source. He also noted that it is important that states building a more diverse electricity mix retain their renewable portfolio standards and incorporate them into Clean Power Plan-anticipated implementation. Utility-scale solar accounts for about 60% of solar being built today and in the next several years. As this is occurring, Mr. Kimbis emphasized the importance of affordability, reliability, diversity of energy supply, and environmental benefits.

With respect to distributed generation, Mr. Kimbis highlighted three goals. First, he emphasized that net metering—the ability to sell excess energy back to the grid—be preserved. Second, he noted the importance of ensuring that rate design principles are designed and applied fairly. Finally, Mr. Kimbis noted the need for identifying the role of consumers, and that they should fully understand the solar transaction, an idea that circles back to his initial comments on better education about solar choices.

Ms. Lisa Wood

As the Executive Director of the Institute for Electric Innovation and Vice President of the Edison Foundation, Ms. Wood represents members that are the nation’s investors and utilities. The Edison Foundation is the foundation arm of EEI.

Ms. Wood highlighted three major trends driving change. The first is the transition to a clean energy future. She noted that the power industry is the largest investor in clean energy in the U.S. and that utilities are expecting solar to grow enormously. The second trend she noted is the increasingly digital and distributed power grid, which allows for greater integration of large-scale, distributed resources as well as creating a more reliable, resilient, and efficient grid. The third trend Ms. Wood highlighted was the increase in individualized customer services, which point toward a more customized service model for the electric utility industry in the future.

Ms. Woods noted the changes required in regulation as well. The speed of the transformation of the power sector depends to a great degree on where regulation evolves to accommodate the changes. Ms. Wood noted that the electric utility industry is particularly attuned to state regulations at the distribution level. She also underscored the value of the distribution grid, which becomes increasingly important as more distributed energy resources become available and a movement toward the digital power grid continues. As other panelists mentioned earlier, Ms. Wood reiterated the issue of valuation for grid services and infrastructure in the evolving power grid. Any approach to valuation and rate design will need to assure that the utility can recover the cost associated with providing grid services.

Mr. David Springe

The National Association of State Utility Consumer Advocates (NASUCA) represents state utility consumer advocates from about 40 States and the District of Columbia. The majority of



NASUCA members are statutorily tasked with representing customers at the state level. NASUCA's members represent a very diverse membership of customers across all economic classes.

The fundamental theme of Mr. Springe's remarks focused on the importance of preserving the "basic utility service." He stated that the vast majority of customers need safe, reliable, and affordable power. New technologies provide services, but they should not be provided at the expense of other customers. Mr. Springe commented that some customers will find alternatives for energy, but that does not mean that utilities can recover all the costs for those services. He also adds that there is a hype surrounding "Utility 2.0." He cautioned to watch the exuberance for new technologies. For example, in the smart meter debate of 2007–2008, there was a vendor-driven exuberance about what those meters can do. Mr. Springe emphasized that while "the opportunities are boundless, [consumers'] wallets are not."

NASUCA is supportive, however, of cost-effective technology to provide better efficiencies at lower costs for consumers. Ultimately, Mr. Springe urged DOE to recognize that many of these investment decisions are made at the state level, and only detailed evaluation of data and evidence with robust representation of all stakeholders will lead to good policy. Mr. Springe noted the important role DOE serves in facilitating discussions, but DOE should be careful not to presume answers to these questions.

Mr. Robert Powelson

Mr. Powelson represents the Pennsylvania Public Utility Commission (PUC), serves as the First Vice President of the National Association of Regulatory Utility Commissioners (NARUC), and is a member of the Electric Power Research Institute Advisory Board. He spoke about the tectonic shift in the energy sector and the rise of numerous companies in the last 15 years, including Tesla, Nest, Sunrun, and others. He characterized states—with their diverse customer base—as incubation labs.

He spoke about Pennsylvania's renewable portfolio standard, which was signed into law in 2004, and the statewide energy efficiency program that was enacted in 2008. He highlighted that industrial customers as well as residential customers are embracing these new technologies, which he states are empowering the customer. For instance, by 2020, Pennsylvania will have full deployment of smart metering. Customers are seeing dynamic pricing options. There is also an added benefit in outage management. Across the utility-customer "food chain," states are leading this change. He advocated for the alignment of rate making to support these technologies.

But, he strongly cautioned that many consumers do not care for new technologies, of being "empowered," but desire simple eight-cent electricity. PUCs must make sure they are protected just as much as consumers can get access to new services and technologies being offered. Mr. Powelson commented that PUCs must always keep this balancing in mind and so should the QER process. He also commented on the role of utilities on new services and technologies by saying that "utilities should do the boring good and let markets do the innovative".

Referencing the Supreme Court Case on FERC Order 745, Mr. Powelson noted that Pennsylvania joined California and Maryland in supporting the FERC, though most of his fellow PUCs did not.



He notes that in Pennsylvania, if you look at demand-side resources from school districts to municipalities all the way down to the residential customers, it is a very robust market. It is creating an environment in which we are not only seeing direct investment in these companies coming into the market, but huge energy savings for customers as well. It is the value proposition and customer choice that is changing, and state regulators should embrace these changes.

Question and Answer: (Note: All questions asked by the moderator, Chris Kelley):

Question 1: Several of you mentioned significant investment that has been made at the distribution level, for instance, in things like advanced grid technologies. Do you see a customer benefit to investments?

Mr. Powelson said, “I do see a customer benefit... We’re moving toward cleaner energy sources, which are now coming behind the meter into the home... Customers are embracing them, and I believe there is a corollary on price.”

Ms. Wood, commenting from the customer perspective, said that meters are a building block for the Smart Grid, but the biggest change for customers has been the outage management and restoration functions. The second major change is the ability to integrate distributed energy resources with the meter, both on the supply and the demand side. She also stated that while she believes that there has been “a lot of hype... about Smart Grid technologies,” she thinks that “we are now seeing some technologies behind the meter that customers now are able to take advantage of.”

Mr. Springe and Mr. Nadel agreed with Ms. Wood’s comment on the usefulness of outage management and meter technology. However, Mr. Springe still cautioned to go slow, do pilot projects, and try out what works and what doesn’t. As he said, at the end of the day, “We [have] to have plain vanilla [for those customers who want it].”

Mr. Nadel added that on average, there are many more opportunities, and we need to allow customers to take advantage of the many capabilities that these technologies have to offer beyond just automatic meter reading.

Question 2: On customized measures: can you comment on what industry is doing in enabling these services, and if there are ways for the Federal Government to support this position?

Ms. Wood noted Google, Apple, and Microsoft as examples of large companies that are working toward 100% renewable energy to meet their corporate sustainability goals. Utilities are working to provide that customized service. One example of a success story is in Nevada—NV Energy with Switch and NV Energy with Apple.

Mr. Nadel added that customized service can be very valuable, and we have to have a balance between allowing utilities to do this without undue constraints while also not giving them an undue advantage. Mr. Nadel is aware that “some states are grappling with this,” but “conceivably—I don’t know whether it is NARUC or DOE—they want some model regulations.”



Mr. Powelson added that the neighborhood collaborative on rate design will work to come up with best practices on alternative rate making. NARUC is using this newly formed committee to say what best practices exist and to hear from all sectors of utilities.

Mr. Kimbis added that net metering is the critical question for solar, and states need to analyze the benefits and costs. Mainstream solar providers have different opinions of putting solar distributed generation across the distribution system. California promoted net metering and allowed utilities to collect fees so that solar generation producers could pay for interconnectedness with the grid.

Mr. Nadel added that there is more need for creative solutions, for instance, with time-of-use rates.

Question 3: What advice do you have for DOE's QER Task Force?

Ms. Wood noted that as distributed energy resources grow in a big way, DOE can help us look at the tension between them and the grid. She also urged DOE to consider the future of the electricity industry while maintaining focus on the most affordable ways of doing things.

Mr. Powelson emphasized that collaboration with states is critical in this process as DOE's outreach with states is important in the discussions on regulatory uncertainty, investment in grid modernization, and other issues. This alternative rate-making commission is also very key.

Mr. Springe noted that DOE provides the tools, the information, and the facilitated dialogue. He cautioned that as DOE convenes all of the stakeholders and gathers all of these new ideas, "it doesn't necessarily mean we should do them." He asks that in the writing of the QER, DOE consider one question: "Is there a cheaper, better way to do what you're doing?"

Mr. Kimbis urged focusing on helping states perform analysis for implementing the Clean Power Plan. He also highlighted fuel diversity and consumer choice as two issues to consider.

Mr. Nadel stated that energy efficiency can reduce bills, which is what consumers care about. The market is very powerful, but we need policies to help channel the market to make this happen. The restructuring of California's electricity market, which led to an eventual energy crisis in 1994, serves as a cautionary tale against assuming "the market will take care of everything." Also, he warned that we should not overinvest.

Public Comment Segment:

Jonathan Canis

Mr. Canis is a partner with the Washington, D.C. law firm Arent Fox, and he represented the Multi-Tribal Power Authority recently formed by seven Sioux tribes in South Dakota. They are interested in developing a one-to-two-gigawatt utility scale wind production and transmission facility across their reservations. The Multi-Tribal Power Authority is a member of APPA, who helped the Multi-Tribal Power Authority set up their association. The Multi-Tribal Power



Authority needs a 20-year power purchase agreement, and it needs to be coterminous with the power bonds. This would require new policies from the government.

The Western Area Power Administration transmission infrastructure program and the Southwest Power Pool are well positioned to help the Multi-Tribal Power Authority in planning for new transmission and talking about heading up their own facilities.

Ms. Barbara Tyran

Ms. Tyran represented the Electric Power Research Institute (EPRI), which is an independent nonprofit organization that conducts research and development related to generation, distribution, and end-use.

EPRI supports DOE in its development of strong technical and analytical tools to identify industry's needs and is doing much work in scope with the second installment. EPRI has a large amount of work that can be incorporated to QER analysis including a concept paper on the integrated grid, a benefit-cost framework, three papers on connectivity, flexibility, and resilience, all of which it plans to share with DOE. Additionally, EPRI is supporting efforts on cleaner efforts for technology-based asset management and customer behavior research that ensures consumers understand cost options. EPRI looked forward to providing insights on the future of the integrated energy system as well as understanding the customer and for the opportunity to participate in the QER process.

Concluding Remarks

Dr. Karen Wayland, EPSA Deputy Director for State, Local, and Tribal Cooperation

Dr. Wayland closed the meeting by thanking the panelists and audience. She noted that the formal comment period runs from February 4th until July 1st and that in addition to the public meetings, comments, data, and reports can be shared with DOE throughout the comment period by going to energy.gov/QER.

Dr. Wayland noted that last year's stakeholder engagement process was highly informative and invaluable to the development of both insights in the report and then the recommendations. She highlighted how critical the process was to the White House, to the Secretary, to internal analysts, and others, echoing similar comments said by Secretary Moniz, Dr. Holdren, and Dan Utech at the beginning of the meeting.

She concluded the meeting by thanking the EPSA staff that helped put the meeting together as well as BCS, Incorporated and Chris Kelley.