U.S. Department of Energy
Electricity Advisory Committee Meeting
NRECA Conference Center
Arlington, VA
March 18, 2016

Summary of Meeting

PARTICIPANTS

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KEVIN LYNN
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DAVID MEYER
U.S. Department of Energy

MATT ROSENBAUM
U.S Department of Energy

Speakers, Guests and Members of the Public:

JOE DOMINGUEZ
Exelon Corporation

ROBERT ETHIER

Independent System Operator New England

ROB GRAMLICH
American Wind Energy Association

CARL IMHOFF
Pacific Northwest National Laboratory

BEVERLY HEYDINGER
Minnesota Public Utilities Commission

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EAC Smart Grid Subcommittee Activities and Plans

Distributed Energy Storage Work Product – Seek EAC Approval

Mr. Brown provided a high-level outline of the Distributed Energy Storage (DES) Work Product on behalf of Carlos Coe. Mr. Brown provided a brief summary of the background of the DES paper explained the definition of DES for the purpose of its use in the paper. The scope of the paper

focused on DES in the context of markets, regulatory and interconnect, technology and applications, benefits, and codes and safety. The appendix of the Work Product covers a broader set of DES resources including thermal energy storage. Recommendations to DOE are provided in the paper as well as recommended follow-on work.

Mr. Brown explained that the DES Project Map of the United States that was used in the DES Work Product was used to make the point of how much growth energy storage has experienced. One mechanism used in the production of the Work Product was a number stakeholder interviews that were involved with DES. The interviewees covered a wide spectrum of vendors and service providers, the distributed energy storage utilities of various kinds, and also public agencies. Thermal storage was not included in the scope at the time interviews were held. There was an additional conversation held aside from the interviews from the automobile industry using EV Batteries as DES.

Mr. Brown summarized the recommendations to DOE, which include accessing and tracking lessons learned from projects and market development of DOE; three recommendations for model development; assessing applicability of existing utility-scale codes and standards, and DG codes and standards to smaller-scale distributed storage; leveraging DOE's unique role as an unbiased arbitrator with technical expertise; assisting in the deployment of new standards and codes for DES; and developing technologies that increase performance, cost effectiveness and safety factor of DES systems.

After the EAC made minor suggestions for the Cover Letter, Mr. Brown moved to approve the Distributed Energy Work Product. Chris Shelton seconded the movement. The Distributed Energy Storage White Paper was passed unanimously.

EAC Member Discussion of Smart Grid Subcommittee Work Products & Plans

The Smart Grid Subcommittee is currently at the next step of determining what the Subcommittee can contribute to DOE. One of the topics the Subcommittee is looking at is the implications of the Internet of Things and what it means for power systems. The Subcommittee had an initial scoping discussion to identify interest from the Subcommittee. Interoperability, cyber, and benefits of the power system being able to integrate connectivity of electricity using devises of how the power system is operating targeting. The Subcommittee is targeting a potential panel at the fall EAC meeting.

Mr. Brown shared that during the Leadership meeting, the team discussed having a Transactive Energy Panel at the June EAC meeting, which would be led by the Smart Grid Subcommittee. The Subcommittee call being held on March 24, 2016 will be used to initiate the discussion and make a decision on the potential June panel.

EAC members discussed pulling all of the recent topics of discussion together to form a panel for June. There was a suggestion to have a June panel on the concept of "market coupling," where distribution markets, which are going to be dynamic around local reliability and load optimization, are coupled with the wholesale market using LMP and DLMP. Pat Hoffman suggested picking a region to focus on in order to create cohesion.

Members continued to have a discussion around what the critical elements are of a roadmap, and how to create cohesion from an influential standpoint. Anne Pramaggiore suggested having a three different roadmaps: technical, policy, and regulator. To add on to Anne's suggestion, an EAC member recommended that since there isn't a singular kind of region to perhaps look at an environment that has disconnects that will interfere. A final suggestion from DOE on the cohesion topic is to characterize different types of regions and think about best practices, roadmap, and competencies and take lessons learned as a case study.

EAC Energy Storage Subcommittee Activities and Plans

Mr. Merwin Brown, EAC Energy Storage Subcommittee Chair, introduced the next two presentations. The EAC will be updated on the progress of the High Penetration of Energy Storage Working group and the Biennial Storage Assessment Working Group. The Biennial Storage Assessment is required by law every two years. There is also a legislative requirement that the Energy Storage Subcommittee put out a five year strategic plan that goes to DOE and due in 2017. The five year plan and the Biennial Storage Assessment will have to get in front of the EAC in September in order to get approval this year, or the group will use a WebEx to approve the two documents.

High Penetration of Energy Storage Working Group

Mr. Chris Shelton, HPES Working Group Chair, provided an update on the HPES Work Product. After the September 2015 EAC meeting, the group had an in-person working session and defined a number of scenarios. On January 20, 2016 the working group held a virtual working session and reviewed all prior input (including panel discussion from September meeting), discussed and finalized drivers for candidate scenarios, and reviewed the first draft outline of the paper.

The next in-person working session will be held after the EAC meeting on March 18, 2106. The objectives are to: explore givens, choose base scenarios, refine draft outline, and launch work assignments. The goal is to have a final work product recompleted by the second half of 2016 for approval in spring 2017.

Mr. Shelton provided background on the HPES paper, and how the topic came up. In the past decade there have been many studies focused on the impact of high penetration of renewables on the grid, which informed the work undertaken to help move in the direction. There have been few comprehensive studies of a similar nature for energy storage. The HPES paper will be developed to inform how the DOE might engage on the topic. The paper will move beyond technology and adoption forecasts to envision a possible end states. This type of exercise will assist with determine the appropriate type of analysis that should be considered today.

Mr. Shelton shared that the working group will use a scenario approach. A two-by-two matrix made up of independent variables will be used to derive the scenarios. The dimensions of the two matrices developed are: High Penetration of Variable Renewables vs Moderate Penetration of Variables Renewables, and Policy Driven vs Market Drive; and, High Control & Visibility, Integrated Planning vs Loosely Integrated, and Policy Driven vs Market Driven. Within these

dimensions, different futures could be pointed out and the role of storage could be explored within those futures. Examples have already been found in the marketplaces that represent different scenarios. The goal is to pick at least three scenarios from one of the matrices. Mr. Shelton shared the draft outline for the paper.

Biennial Storage Program Assessment

Mr. Ramteen Sioshansi provided a brief introduction to the 2016 Biennial Storage Program Assessment. Every five years the Energy Storage Subcommittee is required to develop an energy storage plan, and every two years the Subcommittee is required to assess the performance of DOE in meeting the goals and objectives of the plans developed. The timing issues is that a Biennial Assessment is due this year, the five year plan is due in 2017, and another Biennial Assessment is due in 2018. There has been some discussion about combining some of the requirements to reduce the amount of work.

Mr. Sioshansi continued his presentation with sharing the changes being made to this year's Biennial Storage Program Assessment. In 2014, the Assessment went into a lot of detail recapping DOE's storage goals and strategy. The plan for 2016 is to spend less time telling DOE what it is already doing. As far as the organization goes, in 2014 the recommendations were buried in the text as opposed to being succinct with a 1-2 page summer with recommendations upfront. The detail of the assessment and recommendations will be provided in the follow-up text.

The Working Group is currently conducting outside interviews with users and implementers of DOEs storage program. The categories of interviewees include Regulators, ISOs/RTOs, Storage Developers, Storage Deployers, Storage Researchers, and Consultants. The categories represent the range of organizations that would carry out DOE's storage mission or directly benefit or use the research development and deployment programs.

In terms of next steps, Mr. Sioshansi shared that once interviews have been completed, the working group will arrange to have discussions with DOE personnel to get feedback on some of the findings. Next, with input from the subcommittee, the working group with have a discussion on potential recommendations. The goal is to submit the report to the EAC for approval at the September EAC meeting. Mr. Sioshansi believes that this Assessment should not be pushed off until 2017 because the feedback provided in the interviews will not be as pertinent. The thinking is to try to get feedback from the Assessment interviews that would pertain to the 5 year plan as well. Mr. Shelton suggested feeding the HPES paper back in to the five year plan due in 2017 and doing those in parallel.

Since the new potential timeline just came up at the EAC meeting, the working group has not reviewed the balance of interviewees to determine if the input will be usable for a five year plan. Mr. Sioshansi explained that there are a number of standard questions being asked in each interview that are a combination of backward and forward looking.

EAC Power Delivery Subcommittee Activities and Plans

On behalf of David Till, Gordon van Welie shared updates on the Power Delivery Subcommittee's

current activities and future plans.

Value of a VAr Work Product Recommendations on Electric Grid Voltage Support

Mr. van Welie reported that the Work Product has been in progress for just under a year and it is nearing completion. Finishing touches are being added and the plan is to have voting done through a webinar before the June EAC meeting.

EAC Member Discussion of Power Delivery Subcommittee Work Products & Plans

Mr. van Welie noted that the Subcommittee is looking at a potential future work product on high penetration of electric vehicles. Although this topic was looked at by the Committee about five years ago, the consensus is that it has moved forward substantially and is worth revisiting. Mr. van Welie noted that Ake Almgren raised a point that he thought there might be an opportunity to think about it from a policy point of view, and make the connection between moving towards higher penetration of electric vehicles and the policy implications in terms of supplying renewable energy to those vehicles. The Subcommittee has not made a final decision to who will own the work product.

Mr. Shelton pointed out that there would be a lot of overlap between the electric vehicle work product and the high penetration of energy storage work product. Mr. van Welie also agreed that there will be overlap and noted that there could be two dimensions. One is how to create the right incentives for the vehicle owner, and the other is the issue is that the point of electric vehicles is to decarbonize which means you would need to bring them renewable energy. Ms. Zibelman made a comment about the broader issue of the hosting capability on the grid.

Mr. van Welie explained that Ake Almgren will most likely be the lead on the work product, and follow-up conversation about how to interrelate transactive, software, hardware, etc. will be necessary. He shared that the work product may want to be divided into two topics one being the distribution element and the other being how to supply the renewable energy. Mr. Centolella added there might be a third topic on the transportation sector.

Interactions Between Public Policy And Wholesale Market Design Panel

Gordon van Welie stated the panel objective to evaluate how the two policy goals of getting reliability through wholesale markets and reducing emission can be achieved simultaneously, and introduced the Valuation and Integration of DERs panelists including: Joseph Dominguez, EVP, Government and Regulatory Affairs and Public Policy, Exelon; Dr. Robert Ethier, VP Market Operations, ISO New England; Rob Gramlich, Senior VP, Government and Public Affairs, American Wind Energy Association; and Chair Beverly Heydinger, Minnesota Public Utilities Commission.

The first panelist, Dr. Robert Ethier, ISO New England, presented on the market conditions and state goals in New England.

Dr. Ethier explained that New England is in the early stages of discussion for how to keep the wholesale market functioning while implementing policies to achieve various state goals. New England is facing issues from the low cost of natural gas that is driving out other methods of energy generation, high retirements of non-gas generation in coming years, and aggressive state goals to increase renewable energy generation and reduce GHG emissions. These challenges highlight the importance of having a reliable wholesale market structure that supports new resources with the ability to be turned on and off.

Dr. Ethier explained the repercussions from the increasing trend of renewable generation and energy efficiency on the energy and capacity markets in New England, including the effects on energy prices, reliability, and entry of new resources. He discussed the objective of wholesale electricity markets and market design requirements that must be met in order to ensure adequate and reliable resources and cost competitive energy.

Dr. Ethier explained NE ISO's concerns about the unexpected consequences from achieving state objectives outside of the market (i.e. states that enter the capacity market at zero). However, he noted that wholesale markets and environmental policies can operate together, which is exemplified by SO_x and NO_x trading policies and REGI. He suggested possible solutions to the conflicts between wholesale market and GHG emission reduction goals that included a carbon tax and paying a premium for renewable generated electricity.

The second panelist, Joseph Dominguez, Exelon, presented on the challenges posed to wholesale markets by state objectives to reduce carbon emissions and possible solutions.

Mr. Dominguez began his presentation noting that there is no inherent conflict between environmental objectives and the wholesale market but problems arise when policies are put in place that reward clean energy generation outside the market rather than requiring these services to be appropriately valued and payed for in the market. He explained the challenges that state objectives pose to the wholesale market, including the difficulty around valuing and paying for energy services that are required to reduce GHG emissions. Another wholesale market challenge that occurs when low natural gas prices distort the energy generation market (e.g. negative prices), which creates about 90% of the energy market revenue. Mr. Dominguez explained a third issue that occurs in the capacity market when the need for nuclear to support generation is underestimated, which can be observed in the underdeveloped MISO capacity market that now requires policy reforms.

Mr. Dominguez provided three options for achieving state goals while maintaining the function of the wholesale market. He explained the first option is to put pricing solutions in the market and how a mass-based approach to CPP compliance that requires regional cooperation is consistent with market objectives. The second option is to mitigate the energy market payments. Mr. Dominguez discussed the different options for mitigating fixed and variable costs both within the energy and capacity markets and why mitigating costs in the energy market is one solution. However, he noted that price mitigation is a complicated issue and is just one option for maintaining wholesale market function. The third option is to recognize that the national system will be a hybrid of different resources unique to certain states and start moving towards a market structure that deals with capacity resources and non-capacity markets and recognizes that all zero

carbon resources on the market will need added market support.

The third panelist, Rob Gramlich, American Wind Energy Association, presented on maintaining the function of wholesale markets from the perspective of renewable generation.

Mr. Gramlich prefaced his presentation with a remark about how grid focuses need to shift to new challenges in the face of changing markets. He explained the market challenges posed by retail competition and capacity markets and how grid planning and market functionality will need to be regionally addressed as states move towards achieving lower carbon emissions and maintaining reliability. He agreed that the capacity market is the best way to procure reliability resources but the fact that capacity market services are undervalued is an issue that will need to be addressed in order to ensure that the market will continue to provide adequate services.

However, Mr. Gramlich explained that these issues are not new and renewable generation will not exacerbate them. He noted the market issues created by low gas prices and explained how the falling cost of wind energy generation in recent years has exhibited how penetration of wind generation onto the system is achievable domestically and abroad.

Mr. Gramlich provided possible solutions, including carbon reduction policies and short, mid, and long-term contracts, similar to contracts used in RTOs. He explained in what situation each solution would work and the associated benefits and challenges. In summary, Mr. Gramlich explained that the conflicts between retail competition and capacity planning are not specific to renewable generation or carbon emission reduction goals.

The fourth panelist, Chair Beverly Heydinger, Minnesota Public Utilities Commission, presented on the market atmosphere, state goals, and how they work together in Minnesota.

Chair Heydinger explained that Minnesota is a vertically integrated state (VIS) with several distinguishing features. She explained that, in a vertically integrated state, the wholesale market serves and expands open markets. The state and market experience adjustments over time that allow them to achieve similar results as non-VIS but don't require states to see how they can work better within an existing market structure. Chair Heydinger added that this VIS structure does prevent a demand response market in Minnesota and there is a role for wholesale markets but, overall, the vertically integrated state model has worked well for them as they move towards a future with increased reliance on renewables.

Chair Heydinger explained Minnesota's robust integrated resource planning process and the state's aggressive energy efficiency, greenhouse gas reduction, and renewable generation plans. The Commission has committed to helping utilities as they plan for system transitions by ensuring that rate structures reflect their investments. Chair Heydinger explained how these rate structures reflect capitol and capacity costs that can facilitate entry of renewable generation and allow generation like nuclear plants and wind to afford providing energy through fluctuating load prices, which help Minnesota meet their energy goals.

Chair Heydinger explained how utility participation in a larger footprint facilitates efficient and cost effective use of resources and how Minnesota's involvement in MISO has allowed them to

plan for and manage load peaks, assure reliability, lower costs, hedge against system congestion, and benefit from the MISO auxiliary services market. She noted that one challenge for utilities has been serving customers in multiple states with inconsistent policies but MISO handles balance policy across states by planning and forecasting generation and load for the coming year. Chair Heydinger concluded by noting that 90% of the load served by MISO is by VIS so being part of MISO and using a VIS model has worked well for Minnesota.

EAC Discussion of Interactions Between Public Policy And Wholesale Market Design Panel

Mr. John Adams and Mr. Dominguez discussed price formation for renewables including which factors have and should be considered, specifically zero marginal costs. Mr. Dominguez explained why zero marginal costs will be set by the market and won't be built into traditional prices.

Mr. Paul Roberti and Dr. Ethier discussed how long-term contracts will affect the capacity market, revenue, and entry of clean energy resources. Dr. Ethier explained that long-term contracts are possible but are fundamentally different from the current system. He elaborated on long-term contract options and associated challenges, including issues states could run into down the road and the difficulty around determining who should sign them. He suggested that a carbon tax would be a better solution because it would provide a broader array of cost-benefit functions.

Mr. van Welie and Dr. Ethier discussed the requirements of a functional distribution market and the impacts of long-term contracts on distribution and wholesale markets. Mr. Gramlich described the purpose of the relatively unchanged full market model and explained current needs (e.g. more flexibility that percolates down to the distribution level).

Mr. van Welie and Mr. Gramlich discussed the challenges of identifying service providers if small valuations of service are locked into contracts and how those issues can be addressed through obligation assignments in bilateral contracts. Chair Heydinger drew the parallel of the energy market reliability obligation issue to similar telephone company issues and explained the challenges around the least cost effective customer.

Chair Zibelman raised the idea that markets are not the end game and suggested that the conversation should be around how markets can do their job. Mr. Gramlich and Mr. van Welie agreed and discussed how it is possible to achieve state goals through methods that are compatible with markets and avoid contracts.

Mr. Roberti and Dr. Ethier discussed the pros and cons of an energy only market like ERCOT's (i.e. no capacity market) for accomplishing state goals will maintaining existing markets. Dr. Ethier explained why NE would need to have really high scarcity pricing in an energy only market to ensure loads are met while ERCOT may have more flexibility with reliability. Chair Audrey Zibelman added that the conversation about capacity planning and the feasibility of achieving reliability through retail competition is a regional one and explained the factors that New York considers when assessing if markets can accommodate state interests. She also discussed the possibility of nuclear generation and the impacts of low natural gas prices and tax revenue from generation in New York and provided some suggestions for moving the market forward. Chair Heydinger agreed that how states pay for and nuclear effects capacity is an important discussion

and explained how rational capacity planning can get bypassed.

Mr. Mount noted his skepticism that energy only markets can remain viable with entry of energy storage and renewables. He and Dr. Ethier discussed how long-term contracts can be attractive to new wind farms, including appropriate valuation and pricing of wind services and addressing the lack of charge back mechanisms for reserves or ramping. Dr. Ethier explained what would need to happen in order for states to either use long-term contracts or restructure the market to achieve their goals and noted that he was working to explain all the options available to states so they can make the best long-term decision for them.

Mr. Popowsky and Mr. Dominguez agreed that low gas prices have distorted energy market prices and discussed if a pricing model other than a single market clearing price or if a rate based system would be better than paying market prices to ensure that wind and nuclear generation can be maintained when natural gas lowers energy prices. Mr. Dominguez raised his concern with paying back to the system when negative energy prices occur and explained why he suggests a hybrid system that includes environmental characteristics in price formation.

Mr. Centolella discussed the level of scarcity allowed in energy versus capacity markets and scarcity as a driver of market selection. He and Dr. Ethier discussed the existing and possible metrics that can help answer if developing a capacity market, signing long-term contracts, a combination of the two, or an alternative approach is the best way to provide viable long-term reliability, specifically DOE's role in developing these metrics. Mr. Gramlich added that reliability is a public good so energy commissions should address the capacity market question and explained the benefits of having a capacity market.

Mr. van Welie, Mr. Gramlich, and Mr. Centolella discussed the government's role in determining the need for and creating a regulatory regime for a capacity market, including FERC's requirements for a capacity market and MISO's position behind incentives to enter long-term contracts or create a capacity market.

Mr. Dominquez explained why current capacity markets are not 'real' markets and why states do not want to be without any capacity market mechanisms. He added how the markets would need to change in orders of magnitude to allow entry of renewables and suggested DOE explain the effects of pulling subsidies and adding a carbon tax on market generation. Mr. Gramlich noted that we are moving to a competitive market with externalities in price and added that capacity and wholesale markets are not mutually exclusive.

Chair Zibelman looped back to the discussion about DOE's role in capacity markets and explained why it is important for DOE to get realistic and nationally address the extremely low gas prices so as to maintain diverse generation. Mr. van Welie agreed and raised the question if similar steps for entry of renewables should be taken with nuclear generation. Mr. Thilly explained the reasons why having both short-term capacity markets and long-term contracts to maintain diverse energy generation is beneficial and added that entry of nuclear generation without long-term contracts is unlikely.

Mr. Cowart explained the need to derive values for grid flexibility and renewable resources when

designing wholesale markets in order to have meaningful capacity market prices and explained how a market that allowed demand response and storage could achieve values that include scarcity prices. Mr. Cowart agreed that policy with a high enough carbon tax to drive renewable entry is unlikely and he, Mr. Gramlich, and Dr. Ethier discussed how it is possible, in theory, to have an energy only market with costs that reflect scarcity pricing from inconsistent renewable generation. However, it is unlikely to occur until stakeholders can provide their own services because regulators are uncomfortable setting a price for the low value energy consumers.

Mr. Cowart explained how the demand side question is not about rolling blackouts but rather who is willing to have interrupted energy at a price. He, Dr. Ethier, and Mr. Dominguez discussed why a lot of utilities are in short-term but not long-term contracts even though long-term contracts could reduce generator volatility and retail supplier variability.

Mr. Zichella noted the differences between New England and the west and explained some of the western influences that are shaping a hybrid grid and energy only market that allows renewable and flexible thermal resources and limits nuclear generation (e.g. aggressive climate policy, lack of capacity market needs, and large footprint). He summarized that the east and west have similar distribution but very different bulk system challenges that will produce different constructs and operation systems. Mr. Dominguez, Mr. Zichella, and Mr. Gramlich discussed what factors to consider (e.g. MW generation, relative carbon value, price efficiency, decommissioning costs, and trading policies) when determining if it would be advantageous to add nuclear generation to the system.

Mr. Brown returned the conversation to the DOE focused technical side of the discussion and asked if there was a technology (e.g. energy storage, accurate value calculator, and forecasting tool) that would help address some of the issues discussed.

Mr. Gramlich, Chair Heydinger, and Dr. Ethier noted that DOE's studies on value practice and synchrophasors have been really helpful but more data and better forecasting tools for generation resource location optimization and renewable integration in higher carbon reduction scenarios would be really helpful. Dr. Ethier added that improved tools for grid dispatching would be very helpful.

Mr. van Welie noted that the DOE technical discussion was only one half of the conversation about paying for and maintaining grid services through dramatic system changes. He suggested DOE paint a picture for the conversation about the need for state and federal policy alignment.

EAC Member Discussion of Clean Power Plan Working Group Activities & Plans

Mr. Zichella, EAC Member, facilitated a discussion of the Clean Power Plan (CPP) Working Group's plans. He explained the challenges approaching this topic due to the uncertainty around how states are going to approach compliance with the CPP (i.e. mass-based or rate-based methods).

Mr. Zichella noted that the work group did not have a work product outline but provided current CPP activities and needs, including modeling and tracking of the various state compliance capabilities and actions and the role of the market in compliance. The working group requested

webinars with DOE to acquire knowledge on activities that could help them identify some gaps and make recommendations for DOE and Mr. Zichella presented some of the topics the working group would like DOE to brief them on, including models with state compliance options, federal and stakeholder compliance coordination, climate change risk analysis, and rate design.

The working group next steps are to consolidate and rank the topics after holding webinars with DOE. Mr. Zichella added that he expects the working group to all of the necessary information by the EAC September meeting, although there is not a big time constraint on completing the project.

Ms. Hoffman explained that DOE activities around risk analysis and modeling are topics that DOE could easily provide more information to the EAC. In terms of modeling, the ISOs and RTOs are looking at the effects of modeling in order to make decisions that avoid delving into the generic modeling that is occurring within the ISOs. In terms of energy efficiency, Ms. Hoffman suggested that the EAC working group look at energy efficiency as it contributes to the CPP. She added that the CPP is one of the many reasons why DOE is looking at energy efficiency and asked the EAC to keep in mind that there are a broader set of objectives that the Department is also working on. Mr. Zichella thanked Ms. Hoffman for her comments and noted that energy efficiency is a topic the working group is considering.

Public Comments

No public comments were made.

Wrap-up and Adjourn March 2016 Meeting of the EAC

Richard Cowart, EAC Chair, and Ms. Hoffman thanked everyone for their comments and adjourned the March 2016 meeting.

Respectfully Submitted and Certified as Accurate,

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Analysis Group
Chair
DOE Electricity Advisory Committee

8/18/2016
Date

Carl Zichella
Natural Resources Defense Council
Vice-Chair
DOE Electricity Advisory Committee

8/18/2016
Date

Matthew Rosenbaum
Office of Electricity
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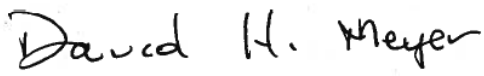

David Meyer
Office of Electricity
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8/18/2016
Date