U.S. Department of Energy
Electricity Advisory Committee
Teleconference and Webinar Meeting
June 25, 2018

Meeting Summary

PARTICIPANTS

Electricity Advisory Committee (EAC) Members:

JOHN ADAMS
Electric Reliability Council of Texas

CHRISTOPHER AYERS
NC Utilities Commission Public Staff

LANEY BROWN
AVANGRID

MARILYN BROWN
Georgia Institute of Technology

JAY CASPARY
Southwest Power Pool

GORDON FELLER
Meeting of the Minds

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Independent Consultant

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Givens Energy

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The Grid Group LLC

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General Infrastructure, LLC

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Edison Electric Institute

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Tri-State Generation and Transmission

M. GRANGER MORGAN
Carnegie Mellon University

JEFF MORRIS
Washington State House of Representatives

ROLF NORDSTROM
Great Plains Institute

BRYAN OLNICK
Florida Power and Light

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Grid-X Partners

HEATHER SANDERS
Black & Veatch

PAMELA SILBERSTEIN
National Rural Electric Cooperative Association

RAMTEEN SIOSHANSI
The Ohio State University

DAVID TILL
North American Electric Reliability Corporation

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KATE MARKS
Department of Energy

JOE PALADINO
Department of Energy

RUSTY PERRIN
Department of Energy

MATT ROSENBAUM
Department of Energy

JULIE SMITH
Department of Energy

Speakers, Guests and Members of the Public:

IULIA GHEORGHIU
Utility Dive

BRIAN HANSEN
MISO

GLENN POPPE
DBL Partners

JAMIE SIMLER
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BLAKE SOBCZAK
E&E News

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PRATISTHA BHANDARI
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JOSHUA SMITH
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Welcome, Introductions, Meeting Logistics

Michael Heyeck, Chair of the EAC, called the meeting to order. Mr. Heyeck acknowledged the presence of Matt Rosenbaum, EAC Designated Federal Officer (DFO) and Wanda Reder, Vice Chair of the EAC, on the call. He thanked everyone for joining the meeting to consider five work products and vote on making them official EAC recommendations. Mr. Heyeck also thanked the subcommittees for the recommendations and their time and effort. He explained that each work product would be allotted 5 minutes for introduction, 5 minutes for discussing any issues that might prevent unanimous approval, and

5 minutes to vote. He said he would ask the lead author to make a motion to approve, and then entertain discussion or amendments, and call the vote by asking for objections. He reminded the Committee Members and other attendees that all communications would be recorded for the sake of preparing a detailed written summary, which would be made publicly available.

Mr. Heyeck said that members of the public will be able to address the EAC during the time allotted at the end of the meeting.

Mr. Heyeck asked Mr. Rosenbaum if the DOE would like to add anything before the EAC began its discussion of the work products. Mr. Rosenbaum thanked all the authors and the subcommittees, and noted that at least 17 EAC Members need to be present to constitute a quorum for voting.

Mr. Heyeck asked Joshua Smith to call the roll. Mr. Smith confirmed that 22 EAC Members were in attendance, thus meeting the voting quorum.

Presentation, Discussion, and Voting on Special Project
Regulatory Reform Recommendations

John Adams, EAC Power Delivery Subcommittee Chair, overviewed the five recommendations in the Regulatory Reform paper:

1. When and if appropriate, the DOE should advise Congress to eliminate or amend the requirement to conduct a Congestion Study. He said the primary driver behind this recommendation is that there have been court decisions that have made these studies ineffective. This is not something DOE can do on its own, and can only make recommendations to Congress if and when appropriate to eliminate this study.
2. Improve, coordinate, and streamline the DOE's issuance of Presidential Permits in the transmission siting and permitting process. The DOE could improve the efficiency of the permitting processes by making internal review and engagement with other federal agencies run concurrently with the state process for siting.
3. Take a proactive approach to Critical Electric Infrastructure Information classification. FERC has an established approach to the designation and sharing of CEII. However, FERC does not focus on national security. The EAC recommends that DOE define a process for classifying critical electric infrastructure information.
4. When and if appropriate, the DOE should advise Congress to eliminate or amend the requirement to produce an update on the status of Energy Storage every two years. The EAC would recommend producing an update on the status of Energy Storage every five years, and focus on grid-scale energy technology.
5. Issue "No Standard" Standards for the products that are at or near maximum technology efficiency levels and Reform EISA 2007 Section 305 (3)(B).

Mr. Adams moved the approval of these recommendations. M. Granger Morgan seconded the motion.

Pamela Silberstein pointed out that she previously expressed concerns regarding two recommendations that are beyond DOE's authority and involve advising Congress to take action. She appreciated the qualifying language "when and if appropriate" for recommendation #1 and #4, and supported these recommendations.

Mr. Heyeck asked if there were any other comments, amendments or objections. There were no objections. The work product was approved. Mr. Heyeck thanked the subcommittee and Mr. Adams for their hard work.

Presentation, Discussion, and Voting on Energy Storage Subcommittee Work Product
A Review of Emerging Energy Storage Technologies

Ramteen Sioshansi, EAC Energy Storage Subcommittee Chair, presented the first of two work products from this subcommittee. Dr. Sioshansi said the document was largely a review and introduction of emerging energy storage technologies and provided some discussion of issues around regulatory treatment and storage. He then summarized the four recommendations:

1. The DOE should encourage the use of a screening tool or process to identify cost-effective solutions that employ energy-storage, demand-response, or other technologies, including opportunities in building efficiency, electricity-distribution upgrades, electricity-transmission upgrades, area heating and cooling, and use of chemical storage for industrial and other processes, chemical feedstocks, or electricity production.
2. The DOE should update guidance documents related to these technologies.
3. The DOE should ensure consistent definitions of energy storage, demand response, and other technologies across federal and regulatory agencies.
4. The DOE should revise efficiency guidelines and metrics. When energy storage capabilities are introduced in some technologies such as water heaters, their energy efficiency can be reduced, so it is important to go back and revise the guidelines.

Dr. Sioshansi moved that the EAC approve this work product. Laney Brown seconded the motion. There were no comments, questions, amendments or objections. The work product was approved unanimously. Mr. Heyeck thanked Dr. Sioshansi and the Energy Storage Subcommittee for the work product.

Presentation, Discussion, and Voting on Energy Storage Subcommittee Work Product
Securing the 21st–Century Grid: The Potential Role of Storage in Providing Resilience, Reliability, and Security Services

Laney Brown, EAC Energy Storage Subcommittee Member, said that this work product was built from a workshop conducted during the June 2017 EAC meeting. She said that an overview of the panel discussions and the insights gained from the workshop have been summarized in this work product with the hope of providing insight into the role of energy storage as part of a secure and resilient modern electric grid. The following recommendations were provided:

1. The DOE should continue to educate and inform regulators on efforts to assess the value of energy storage technologies as it relates to reliability, resiliency, and security. The DOE should continue to work collaboratively with regulators and other key stakeholders to help them navigate the options and determine what best meets their policy objectives and operating conditions. The DOE should expand efforts to develop models, tools, and technical documents that help regulators and policy makers evaluate energy storage technology types and uses.
2. The DOE should continue and further emphasize its research and development on specific power system security requirements. The DOE should continue its research that addresses the value of energy storage to power system reliability and adequacy under a variety of future grid scenarios, involving different resource mixes. It should also support basic and applied research for energy storage technologies and to address deployment barriers, including energy and power densities of energy storage technologies.
3. The DOE should continue to examine power sector vulnerabilities. Continuing its assessment of potential reliability and resilience threats to the electric power system, and evaluating the brittleness of existing and potential future power system designs to such threats, is critical. This examination can form the basis of further study to examine the unique role and capability of

energy storage to address and mitigate such vulnerabilities.

Ms. Brown moved to approve the work product. Bryan Olnick seconded the motion. There were no comments, questions, amendments or objections. This work product was approved unanimously. Mr. Heyeck thanked Ms. Brown and the Energy Storage Subcommittee for the work product.

Presentation, Discussion, and Voting on Power Delivery Subcommittee Work Product

Transmission-Distribution Interface

Heather Sanders, EAC Power Delivery Subcommittee Vice Chair, said that the separation between the electric transmission and distribution systems has been blurred. She summarized the Subcommittee's approach to this work product, including that they interviewed industry experts across the United States and internationally to get a sense of challenges they were facing and some areas where additional work was needed. The following recommendations on the transmission-distribution (T-D) interface were provided:

1. Based on work undertaken to date, the DOE should create a series of educational briefings that focus on key coordination architecture principles (e.g., laminar decomposition, tier bypassing, observability, and scalability), which form the basis for comparing and guiding T-D coordination models.
2. The DOE should assess and report on the status and planned efforts by stakeholders, including FERC, NERC, ISO/RTOs, utilities, public utility commissions (PUCs), municipalities, co-ops, etc., to improve coordination across the T-D interface. This would help understand regional differences on the different models that are chosen.
3. The DOE should develop guidance by providing a process framework that can inform the development of holistic strategies for T-D coordination. Decision makers need a way to identify the capabilities based on their objectives, and a guidance document can help them make these decisions.
4. The DOE should leverage the EAC membership by providing regular briefings for EAC members to share guiding architectural principles, present findings, and obtain additional direction (from the EAC) on the scope of the effort.

Ms. Sanders moved to approve the work product. Ms. Reder seconded the motion. There were no comments, questions, amendments or objections. This work product was approved. Mr. Heyeck thanked Ms. Sanders and the subcommittee for the work product, and said he expects this work product to be a foundational product for future resilience discussions.

Presentation, Discussion, and Voting on Smart Grid Subcommittee Work Product

Enhancing Grid Resilience with Integrated Storage from Electric Vehicles

Marilyn Brown, EAC Smart Grid Subcommittee Vice Chair, said that this work product examined the ability of integrated storage from electric vehicles to enhance grid resilience. Three modes of EV integration are considered: Grid-to-Vehicle, Vehicle-to-Building, and Vehicle-to-Grid. She said that each mode of EV integration comes with a unique set of grid resilience attributes and possibilities, and the need for these grid services will vary across states and regions. Current levels of reserve margins and shares of variable renewable energy will influence the potential revenue opportunities for EVs from reserve, voltage-control and frequency-regulation markets. Dr. Brown pointed out that they conducted a questionnaire of EAC Members and had discussions with experts in the field to arrive at the conclusions. She summarized the key findings and the recommendations:

1. The DOE should increase support for research to create and harmonize standards needed for EVs to integrate with the grid and participate in the market, particularly with respect to bilateral exchanges.
2. The DOE should increase support for research to evaluate the range of possibilities for using EVs for grid services, effects at both the distribution and transmission level, mitigation techniques to avoid negative grid impacts, and impacts of bidirectional charging on the lifetime of EV batteries when used within such systems.
3. The DOE should commence a comprehensive economic study that analyzes US EV penetration scenarios, grid impacts and investment requirements to provide charging infrastructure and generation requirements.
4. The DOE should increase support for research on the range of business models for EV charging infrastructure, policies that create barriers or incentives to each, and provide materials to guide state decision making for ownership, control and rate-basing methodology given the objective of increased reliability and resilience.
5. The DOE should fund additional V2G pilot projects to better understand these challenges, public acceptance, the costs and benefits to vehicle owners, and best practices to best optimize the outcome of electric transportation and grid infrastructure development.

Dr. Brown moved to approve the work product. Ms. Reder seconded the motion.

Dr. Morgan raised the issue of warranties, not just in the context of batteries, but in the context of using plug-in hybrids for backup power generation in the event of large-scale, long-duration power outages. Dr. Morgan suggested that DOE should explore with EV manufacturers the potential for waiving warranty violations during severe power outages to allow for the use of plug-in hybrids for backup power generation. He added that this is an important issue for the topic of resilience that needs to be addressed, and he would like to see reflected in the recommendations, but he will not vote against this motion.

Dr. Brown acknowledged receiving Dr. Morgan's comments, and said that they have already flagged this issue elsewhere in the work product but not added a recommendation for it. She offered to incorporate an additional edit. Dr. Brown, Dr. Morgan, and Mr. Heyeck offered versions of revised language, with the understanding that they would work with staff to finalize exact wording after the meeting. (Note: Final language was "The DOE should work with OEMs to assess the circumstances under which their warranty exclusions may be waived, especially for emergency situations," and was added to the discussion following recommendation #2.)

Dr. Morgan moved the amendment's approval. Dr. Brown seconded the amendment. There were no comments or discussions on the amendment. There were no objections, and the amendment was adopted.

There was no further discussion or objections. This work product was approved. Mr. Heyeck thanked Dr. Brown and the subcommittee for the work product, and Dr. Morgan for the amendment.

Public Comments

No members of the public offered comments.

Wrap-up and Adjourn June 2018 Meeting of the EAC

Mr. Rosenbaum thanked all the members for their efforts and hard work, and said he looks forward to seeing the members and the meeting participants during the EAC meeting on July 9 and 10.

Mr. Heyeck noted that the next meeting will begin July 9th at 1:00 pm at NRECA headquarters, and will continue on July 10th at 8:00 am. The focus of day 1 will be on grid resilience modeling, and the focus of day 2 will be resilience for frequency response. Mr. Heyeck pointed out that the entirety of the meeting in July will be dedicated to resilience, and he hopes everyone can come. He thanked all Members whose terms are ending for their EAC service.

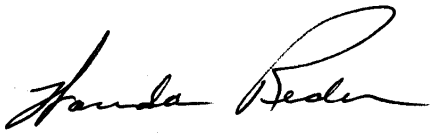
Mr. Heyeck requested a motion to adjourn. Dr. Brown moved to adjourn. Mr. Adams seconded the motion. There were no objections.

The meeting was adjourned.

Respectfully Submitted and Certified as Accurate,

Michael Heyeck
The Grid Group LLC
Chair
DOE Electricity Advisory Committee

7/6/2018
Date

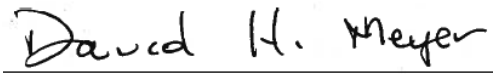


Wanda Reder
Grid-X Partners, LLC
Vice-Chair
DOE Electricity Advisory Committee

7/6/2018
Date

Matthew Rosenbaum
Office of Electricity
Designated Federal Official
DOE Electricity Advisory Committee

7/6/2018
Date



David Meyer
Office of Electricity
DOE Electricity Advisory Committee

7/6/2018
Date