



**U.S. Department of Energy
Electricity Advisory Committee Meeting**

**National Rural Electric Cooperative Association Conference Center
Arlington, Virginia
June 7, 2023**

Day 1 Meeting Summary

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[Registered Speakers, Guests, and
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Meeting Overview

The Electricity Advisory Committee's (EAC) third meeting of 2023 was held June 7 and 8, 2023 using a hybrid format at the National Rural Electric Cooperative Association building in Arlington, Virginia, with the option of virtual participation via the video conferencing platform Webex. On the first day of the meeting, Gene Rodrigues, Assistant Secretary (AS) for the Department of Energy's (DOE) Office of Electricity (OE), and Gil Bindewald, Acting Principal Deputy Assistant Secretary (PDAS) for OE, provided an update on OE programs and initiatives. Next, EAC members and work product leads Rick Mroz and Tom Weaver presented on recommendations to DOE, entitled "Conceptual Basis for Evaluating Resilience Capabilities." The EAC voted on the work product and it passed unanimously. Finally, the EAC's Energy Storage Subcommittee held a panel, entitled "Facilitating a Transforming Grid," which was followed by extensive discussion.

All presentations, as well as recordings of the meeting, can be found at <https://www.energy.gov/oe/june-7-8-2023-electricity-advisory-committee-meeting>.

Welcome, Call to Order, Introductions, and Developments Since the Last Meeting

Jayne Faith, EAC Designated Federal Officer, welcomed attendees, took attendance, covered several housekeeping items, and officially called the meeting to order. EAC Chair Wanda Reder outlined the agenda across both days.

Update from the Office of Electricity

AS Rodrigues, via a prerecorded address, apologized for his absence due to a scheduling conflict and thanked EAC members for their service and for the recent work products they submitted to OE. He emphasized his and PDAS Bindewald's desire for a close working relationship between the EAC and OE to tackle the transformational challenges and opportunities facing the nation's electric grid. He invited suggestions for process improvements to increase engagement, collaboration, and OE's responsiveness to the EAC.

DOE supports reconductoring to economically increase transmission throughput using existing corridors and infrastructure. AS Rodrigues asked for EAC input on what DOE could do to advance the adoption of reconductoring solutions in the near term. He asked the same regarding how to increase the integration and optimization of grid edge resources to support a stable, reliable, and affordable grid.

AS Rodrigues expressed his gratitude to EAC members Mike Heyeck and Tom Weaver, who have served three consecutive 2-year terms, the maximum allowed by the EAC's charter. Mr. Heyeck also served three consecutive terms from 2008-2014.

PDAS Bindewald said that reconductoring and grid edge resources fall into two broader topics of conversation: first, the grid is transforming to become the connective tissue linking many elements together in the nation's economy, national security, and many other areas. Second is the crucial importance of reliability. The EAC is poised to inform the conversation on these two important topics.

PDAS Bindewald noted several items that OE has been focusing on:

- Using reconductoring and other grid-enhancing technologies to harness the existing capacity of the grid. Several related Funding Opportunity Announcements have been released.
- The importance of considering the overall system effects that are caused by the increasing amounts of grid edge resources.
- The importance of data, both in understanding new grid technologies and informing regulatory decisions.
- Requests for Information and Notices of Intent related to supply chain integrity, including innovative advanced transformer designs.

Discussion

Dr. Tom Bialek said that OE should consider reconductoring in a broader context of what can and cannot be done. For example, when reconductoring a transmission line, consider converting it from an alternating current to a high-voltage direct current line with electronic controls to allow for additional capabilities. In addition, Dr. Bialek said to consider situations where there is a better solution set. For example, consider whether a system/circuit would be better served by multiple smaller distribution-connected energy storage units rather than a single large unit, allowing for greater resilience.

PDAS Bindewald agreed that reconductoring is about more than just increasing the capacity of a line and noted that reconductoring can change the relationship among entities on the grid. Regarding storage solutions, OE considers the full toolbox of options and what is most appropriate in a given context. He added that markets should drive and incentivize which solutions are selected.

Mike Heyeck said that standards for managing devices at the grid edge can be incentivized.

Questions and Answers

Q1. Rick Mroz asked for any updates on DOE's activities related to Federal Energy Regulatory Commission Order 2222.

PDAS Bindewald said that he had no official updates at this time but that much of the work they are doing is informed by the understanding that the seams across transmission and distribution are beginning to blur. He reiterated the need to view grid edge resources in a holistic context.

Q2. Mr. Mroz asked for any updates on DOE activity related to the recent developments in artificial intelligence (AI), including the potential security risks posed by advanced AI.

PDAS Bindewald noted that DOE has an Artificial Intelligence and Technology Office and DOE is exploring and assessing the implications of AI for the grid. He suggested that EAC could hold a future panel on the topic.

Q3. Andrew Barbeau asked how much transmission need could be solved by advanced conductor and reconductoring.

PDAS Bindewald said that analysis on that is underway; however, he currently does not have insight into that work.

Presentation of EAC Resilience Metrics Work Product and Vote

Mr. Mroz and Tom Weaver provided an overview of the work product and the context for its development. Complete remarks and presentation slides can be found online via the link provided in the Meeting Overview section above.

Chris Ayers motioned to vote on the work product, Drew Fellon seconded, and the work product was approved unanimously.

Discussion

Bob Cummings said that he sees potential to expand the resilience metrics to the sub-transmission and/or transmission level, and he encouraged that expansion because it would be a very useful tool for regulators. He added that when it comes to capacity, resiliency is a separate item and not wholly dependent upon the attributes of a specific site.

Mr. Barbeau said that including an output from the tool specifying the number of hours of power outage saved by the given resilience measures would make the tool useful to more people.

Mario Hurtado suggested building inventories and datasets to assist with benchmarking and he said that different sites could compare the resilience scores they receive from using this tool and let that motivate them to make improvements.

Mr. Ayers commended the work product authors and said that its contribution to helping define resilience will greatly help regulators.

Lynne Kiesling said that the tool could be expanded in a modular way (e.g., by adding layers measuring resilience in terms of social networks, community infrastructure).

Questions and Answers

Q1. Daniel Brooks asked whether the work product authors considered the relative values of the point multiplier system for the actual outcome. The next round of development of the resilience metrics tool would need to take into consideration resilience measures as they relate to different hazards (e.g., flooding versus high wind scenarios).

Mr. Weaver said that this would be for the larger DOE team that develops this tool to work on.

Q2. Mr. Hurtado asked for the presenters' thoughts on further development of the tool to apply to the distribution system.

Mr. Weaver said that in his work on distribution system planning, they identified transferable areas (e.g., a small town's distribution system infrastructure) and determined the best possible backup infrastructure. He believes that the concept could be used to assign scoring similar to what has been developed in the resilience metrics work product.

Energy Storage Panel and Discussion: Facilitating a Transforming Grid

Moderator

- Dr. Lola Infante, EAC member
- Colette Lamontagne, Director, Energy Storage & Transportation, National Grid

Panelists

- Ray Kubis, Chairman, Gridtential Energy
- Peter Olmsted, Director, Public Policy, FreeWire Technologies
- Jason Handley, General Manager, Distributed Energy Group, Duke Energy

Panelists' remarks and presentation slides can be found online via the link provided in the Meeting Overview section above.

Discussion

Lisa Frantzis suggested that the EAC collaborate with the National Association of Regulatory Utility Commissioners on regulatory issues related to distributed generation.

Questions and Answers

Q1. Ms. Frantzis asked whether there are adequate safety standards in place for distributed energy storage systems.

Mr. Handley said that National Fire Protection Association Standard 855 does address residential storage safety. He said that Duke Energy conducts live monitoring for all assets connected to their transmission and distribution systems.

Mr. Olmsted said that he has not seen widespread implementation of Standard 855.

Q2. Ms. Frantzis asked whether utilities have been willing to provide the customer data needed to optimize FreeWire Technologies' rate designs and products, and whether there is anything that DOE can do to assist with that data challenge.

Mr. Olmsted said that it has been a mix, with some utilities more forthcoming than others. He noted that New York's process for developing the value of distributed energy resources tariffs created valuable dialogue with utilities and yielded useful data, such as the marginal cost of service.

Q3. Mr. Mroz asked whether there are adequate resources to support the emerging lead-acid battery industry, including raw mineral acquisition and end-of-life recycling.

Mr. Kubis said that the industry does not need new minerals due to the high levels of recycling. In his opinion, general support for the industry has been quite limited. The majority of funding goes toward lithium-ion batteries.

Q4. Dr. Bialek asked whether there is something the lead-acid battery industry can or should do to reframe the technology in a manner that promotes greater funding.

Mr. Kubis said that the industry should do a better job promoting the technology and that he sees room for greater collaboration between the industry and DOE.

Q5. Dr. Bialek asked, in cases where utilities are cooperative, whether they have the ability to easily download the type of information that FreeWire Technologies needs.

Mr. Olmsted said that this type of situation is not widespread and is contingent upon the effective deployment of advanced metering infrastructure (AMI). However, when AMI is in place and utilities share the data, it is adequate for FreeWire Technologies' needs. In terms of aggregated data (e.g., related to fast chargers), Mr. Olmsted sees great potential. They have identified several utility demand response programs in which to participate.

Q6. Dr. Bialek asked whether there are shorting mechanisms on batteries or similar capabilities to allow for safely reconnecting batteries. He offered it as an important safety feature for industry to employ more widely.

Mr. Handley said that as far as he knows, Duke Energy does not employ shorting mechanisms on their batteries. However, they have emergency stops on each container to control charging and discharging.

Q7. Delia Patterson asked where a one-pager or similar high-level information on lead-acid battery safety and development to date can be found. As the industry matures, she said that the messaging will need to become more widespread.

Mr. Kubis said that he believes the industry has improved its message, including Battery Council International's recent campaign "Essential Energy Everyday." However, he will work on better outreach to utilities.

Q8. Mr. Ayers asked about the economic feasibility of battery recycling.

Mr. Kubis said that for lead recycling, the recycling industry has matured and the economics work well. For lithium recycling, there are safety challenges due to flammability and combustibility. For high energy density lithium batteries (i.e., those containing nickel and cobalt), there is value in recovering material from the used batteries. For lithium-iron-phosphate batteries, there is not an economically viable way to recycle them.

Q9. Mr. Brooks asked whether transmission planners have the necessary models and tools to properly evaluate storage as a transmission asset. If they are well equipped, he asked whether the regulatory process allows for rate recovery for storage as a transmission asset.

Ms. Lamontagne said that in New England, planners are very knowledgeable about the value of storage; however, they do not have the necessary modeling and tools. For rate recovery, New England's regional transmission organization has proposed regulations for storage as a transmission asset, which Ms. Lamontagne finds limiting.

Q10. Mr. Brooks asked how storage assets across the Southeast performed during Winter Storm Elliot.

Mr. Handley said that storage assets performed to specification.

Q11. Howard Gugel asked what the reliability requirements are for batteries when they are used as a transmission asset as compared to a generation asset.

Ms. Lamontagne said she does not believe that National Grid has defined reliability requirements specifically.

Q12. Mr. Gugel asked whether Gridtential Energy's analysis takes into account losses during cycles, the differences in the footprint requirements of different batteries, and maintenance costs.

Mr. Kubis said that Gridtential has done its best to utilize economic analysis provided by Pacific Northwest National Laboratory, which takes into account the factors that Mr. Gugel referenced. He noted that the technology of lead-based batteries continues to progress.

Q13. Mr. Hurtado asked what utilities are doing to integrate information, such as hosting capacity maps, into their distribution planning.

Ms. Lamontagne noted that hosting capacity is not easy to accurately measure.

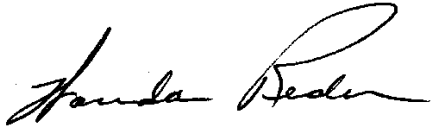
Mr. Olmsted said that developers add charging assets where there is customer interest rather than exclusively considering where grid capacity would dictate.

Concluding Remarks

Mr. Heyeck thanked everyone for their contributions and noted the start time for Day 2 of the EAC meeting. Ms. Faith adjourned the meeting for the day.

Signature Page

Respectfully Submitted and Certified as Accurate,



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

8/17/2023

Date



Jayne Faith
Office of Electricity
Designated Federal Officer
DOE Electricity Advisory Committee

8/17/2023

Date