U.S. Department of Energy
Electricity Advisory Committee Meeting

National Rural Electric Cooperative Association Conference Center
Arlington, Virginia
November 19, 2024

Meeting Summary

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Meeting Overview

The Electricity Advisory Committee's (EAC) third meeting of 2024 was held on November 19 using a hybrid format at the National Rural Electric Cooperative Association conference center in Arlington, Virginia, with the option of virtual participation via the video conferencing platform Webex. During this meeting, Eric Hsieh, the Deputy Assistant Secretary (DAS) for Energy Storage at the Office of Electricity (OE), Mohamed (Mo) Kamaludeen, the Director of Storage Validation at OE, and Vince Sprenkle, the Director of the Grid Storage Launchpad for the Pacific Northwest National Laboratory (PNNL) provided a presentation on updates from OE's Energy Storage division. Then, David Howard, the Director of Grid Components at OE and Rebecca Ward, the Chief of Staff at the DOE Office of Manufacturing and Energy Supply Chains (MESC) gave a presentation on energy supply chains and related DOE efforts. Following this presentation, William (Bill) Parks, the DAS for Grid Controls and Communications at OE, Joe Paladino, a Senior Advisor in OE, Bahram Barazesh, a Principal Power Systems Engineer for OE, and Roshi Nateghi, a Program Manager for OE provided a presentation on energy reliability and resilience. Following this presentation, the EAC subcommittees provided updates. There were no public comments during this meeting. Andrew Barbeau adjourned the meeting.

All presentations and a video recording can be found on the EAC website at Electricity Advisory Committee November 2024 Meeting | Department of Energy

Welcome, Call to Order/Roll Call, and Introductions

Jayne Faith, EAC Designated Federal Officer, welcomed attendees, took attendance, covered several housekeeping items, and officially called the meeting to order. Ms. Faith then noted several updates in EAC leadership:

- Andrew Barbeau will assume the role of EAC Chair and Daniel Brooks will assume the role of EAC Co-Chair.
- Paul Stockton and Dave Herlong will co-chair the Grid Resilience for National Security (GRNS) Subcommittee.
- Jay Morrison and Julia Souder will co-chair the Energy Storage Subcommittee.
- Karen Wayland and Kirsten Verclas will co-chair the Smart Grid Subcommittee.

Andrew Barbeau presented a framework for developing actionable recommendations for OE; the goal of using this framework is to develop recommendations in a timely manner:

- Use EAC presentations and discussions to identify a **problem statement**→Discuss problem statement in the relevant subcommittee meeting to identify **key considerations** and determine a **work product type** → Develop a **work product** with **recommendations** → Vote on recommendations at the next full EAC meeting

Introductory Remarks from DOE Office of Electricity (OE)

Assistant Secretary Rodrigues thanked all EAC participants and noted that EAC members can gain important connections and knowledge from each other to increase information-sharing in the industry. He encouraged EAC members to be productive and constructive to continue to progress the work of the committee. Assistant Secretary Rodrigues emphasized the importance of reliability, resilience, security, and affordability in the power grid for national security, economic development, and economic leadership and noted that the EAC is fundamental to this. He noted that complacency will not serve the electric grid in the future. The EAC should consider OE leadership as co-collaborators. Finally, Assistant Secretary Rodrigues presented a welcome video for new EAC members from Dr. Geraldine Richmond.

Larry Bekkedahl noted that there are likely several existing initiatives within OE to continue. He asked how to recommend the items to prioritize.

Assistant Secretary Rodrigues responded members to take the following actions:

- Follow the existing EAC process and participate in subcommittees to develop actionable recommendations.
- Consider how to balance investments in reliability, resilience, security, and affordability and consider that state initiatives may not always align amongst each other and with the Federal government.
- Consider how to develop a grid that is more responsive, flexible, and that has greater utilization than in the past to take advantage of all existing assets.

Paul Stockton asked Assistant Secretary Rodrigues to share his perspective on moving from voluntary guidelines to a different regulatory structure regarding cybersecurity considering the risk of large-scale attacks.

Assistant Secretary Rodrigues responded that the grid edge is becoming increasingly complex and will increase the threat surface.

- As the grid becomes more of a network, stakeholders will have to secure the grid via technologies, noting that there are no ‘silver bullet’ solutions to security.
- Individuals own, maintain, and control devices at the grid edge which necessitates a stronger understanding of behaviors associated with grid edge resources.
- Regulatory stakeholders must protect ratepayers. However, regulatory stakeholders are understaffed and need a better understanding of how they can help ratepayers.

Deepak Divan noted that technology is advancing in two-year cycles, yet traditional planning cycles take much longer. The speed of commerce outpaces the speed of regulation, and market models must change to incorporate the grid edge.

Assistant Secretary Rodrigues responded that regulatory decision-making will never keep up with the pace of innovation and challenged the group and industry to better navigate through uncertainty. The industry needs to learn how to make informed decisions with some degree of uncertainty rather than waiting for updated regulations.

Tom Kuhn asked Assistant Secretary Rodrigues' thoughts on affordability in clean energy.

Assistant Secretary Rodrigues responded that clean energy should not be an initiative only because it is clean but because there are layered benefits. Utilities, regulators, and policymakers should consider all elements affected by clean energy, such as climate response and resilience. These stakeholders also need to enable decisions in energy investments to fully recognize long-term benefits while maintaining affordability. Global energy leadership will be partially contingent on successful implementation of clean energy.

Presentations and Facilitated Discussions on the 2024 Energy Storage Grand Challenge Summit, OE Peer Review, and Grid Storage Launchpad Dedication

Eric Hsieh, DAS for Energy Storage at OE, Mo Kamaludeen, Director for Energy Validation at OE, and Vince Sprenkle, Director for the Grid Storage Launchpad, presented on the 2024 Energy Storage Grand Challenge (ESGC) Summit and OE Peer Review and resulting impacts, and the Grid Storage Launchpad progress.

Mo Kamaludeen and Eric Hsieh discussed the ESGC summit and OE Peer Review, and the benefits of collocating these events.

- The OE Peer Review consisted of stakeholders from national laboratories, industry, academia, DOE and other organizations. This group worked to summarize the state of the art in energy storage research, development, and application.
- The ESGC Summit aims to accelerate development, commercialization, and utilization of Next Generation energy storage and to maintain American global leadership in energy storage.
- Collocating these two events brought together researchers from the U.S. and other countries and resulted in bilateral research agreements for long duration energy storage.
- Additionally, attendees were able to network more efficiently which led to increased post-event collaboration.
    - For example, these events enabled the national laboratories to collaborate on their work, including research, technical assistance, demonstration, analysis, modeling frameworks, advanced chemistry and materials, and safety and testing. The laboratories assisted each other with resourced and technical knowledge-sharing.
- Sandia National Laboratory released the open-source Quest2.0 analytic tool, which simulates and models energy storage from behind the meter. Sandia National Laboratory also opened the testing facility in 2024, which conducts destructive, mechanical, and failure testing which in turn informs safety measures and first responder tactics.
- The Pacific Northwest National Laboratory provided technical assistance to three states, four utilities, and other stakeholders.
- The National Renewable Energy Laboratory updated its Energy Storage Evaluation Tool with enhanced evaluation, control, and modelling capabilities. Usership of the tool increased from 500 to 2,000 users in 2024.

Vince Sprenkle presented on the Grid Storage Launchpad.

- The dedication for the Grid Storage Launchpad occurred during an August 13, 2024, ceremony. The Grid Storage Launchpad is a DOE owned and operated full-lifecycle technology testing facility. The purpose of the Grid Storage Launchpad is to validate, accelerate, collaborate, and educate regarding new and emerging energy storage technologies. The Grid Storage Launchpad received an investment totaling $100 million to fulfill this purpose.
- The Grid Storage Launchpad is working to get laboratories to an operational state, and then they will set up the process by which companies can conduct testing.

Presenter slides can be found online via the link provided in the Meeting Overview section above.

Discussion:

Andrew Barbeau noted that since the previous Biennial Energy Storage Report, DOE has made significant progress. He asked where the presenters feel the largest gaps remain in DOE's energy storage programs.

Eric Hsieh responded that a complex challenge is helping stakeholders and consumers understand the potential in energy storage. Previously passive energy consumers are now taking a more active role in the type of electricity they use. This challenge, combined with the speed of new technology innovation presents a challenge in helping consumers understand the technology.

Mo Kamaludeen responded that the adoption of safety standards for batteries by first responders and other stakeholders can be a challenge. OE is working on ways to brand and communicate these methods and standards in an understandable, accessible, and consistent manner.

Vince Sprenkle responded that standardization in testing to enable comparability across testing sites is a gap.

Alison Silverstein noted the large amount of homes with existing behind the meter batteries. She asked how DOE is considering how to understand behind the meter batteries and how to inform conversations regarding how to use these existing batteries in a manner that is not disruptive.

Mo Kamaludeen responded that existing safety standards for grid-scale systems are not transferrable to residential systems. DOE has an active behind the meter storage integration prize to help to bridge the gap between DERs and existing standards and operations for grid-scale systems. OE hopes to select awardees for this prize by the end of the year. Part of the goal of this prize is also to build a coalition to increase interoperability. Dr. Kamaludeen also noted that Underwriters Laboratories (UL) 9540 Energy Storage System testing requirements need to evolve to include standard residential systems.

Lisa Frantzis noted the rapid growth of electric vehicles (EV) in the marketplace. Ms. Frantzis asked where OE's Energy Storage division fits within other DOE office working on energy storage, and how OE collaborates with other DOE programs.

Eric Hsieh responded that there is ongoing collaboration between OE and DOE's Energy Efficiency and Renewable Energy (EERE) office, such as using shared materials research facilities,

second-life EV reuse application collaboration, cross-department initiatives regarding the use of EV batteries on the grid.

Deepak Divan noted that technology is moving quickly. Other countries are testing high-performance sodium ion batteries. Dr. Divan asked whether DOE has technology-to-market efforts to regain a global competitive advantage.

Vince Sprenkle responded that the Grid Storage Launchpad aims to have industry insertion points across the testing process. He noted it would be useful to have a standard benchmark to gain an accurate representation of where the U.S. stands globally amongst energy competitors.

Larry Bekkedahl asked whether OE has specific metrics it aims for on an annual basis. He also asked whether OE has use cases for generative artificial intelligence.

Vince Sprenkle responded that metrics in the field will be useful to increase effectiveness. From a research and development perspective, Artificial Intelligence and Machine Learning increase the speed in which research is conducted. It helps to shorten the development window while maintaining fidelity.

Todd Lucas asked which technologies hold most promise for long duration energy storage, short duration storage, and storage density.

Eric Hsieh responded that any answer he could provide would be invalidated shortly due to the speed of innovation, and OE is defining use cases. OE solicitations are open to any technologies.

Greg Poulos asked how regulatory barriers regarding batteries fit into OE's considerations, and whether the EAC can help to address the issue of regulatory barriers.

Mo Kamaludeen responded that regulation hinders adoption of batteries, but these barriers are predicated on battery safety. OE's BlueSky Request for Information examines safety and deployment for batteries. He also noted that regulatory structures vary by region. For instance, after multiple battery fires, the New York State governor commissioned a task force to examine and update safety standards. Dr. Kamaludeen noted that geographies necessitate varying regulations.

Eric Hsieh responded that the EAC can be helpful as the only body that can look across all storage activities and identify and address barriers.

Mark Gabriel noted that batteries are being distributed at substations and asked whether OE is only looking at large-scale batteries for grid-scale battery storage. He asked about where the bridge is for improving control, management, and understanding to operate these systems.

Mo Kamaludeen responded that use cases for substations can be subjective since battery types and use can vary significantly between substations. Visibility in operations is a challenge; some utilities might opt for a third-party operator, while others may have the in-house capabilities to independently operate batteries. OE does not have a central operation examining operations for Distributed Energy Resource Management Systems.

Milo Blair asked how OE considers the breakdown of attendees for the OE Peer Review versus the

ESGC Summit.

Mo Kamaludeen responded that the OE Peer Review occurs early in the technology readiness level scale and therefore has slightly less utility involvement (which typically occurs with more mature technologies). Both the OE Peer Review and ESGC Summit do not focus on technologies ready for mass deployment; rather, they focus on deployment for technologies at early to mid-level investment. Dr. Kamaludeen confirmed that all relevant stakeholder groups would be involved at the mass deployment stage.

Presentations and Facilitated Discussions on DOE Supply Chain Management and Distribution Transformer Shortage

Rebecca Ward, Chief of Staff, MESC, and Dave Howard, Director for Grid Components, OE, presented on MESC's work on supply chain management, research and analysis, and workforce development, and distribution transformer shortage mitigation efforts, respectively.
Rebecca Ward explained that MESC was created shortly after the Bipartisan Infrastructure Law passed. To date, MESC has deployed about $12 billion to transform energy supply chains and to create jobs. MESC focuses on place-based investments that cover a wide range of stakeholders. Ms. Ward explained MESC's three-pronged manufacturing, workforce, and analysis focus areas, that MESC occupies the demonstration and deployment stages of DOE's research cycle and presented key metrics and impacts from MESC's initial work. Ms. Ward then presented MESC supply chain readiness framework and discussed investments in battery storage.

Dave Howard presented on the current state of distribution transformer in the U.S., recent recommendations from the National Infrastructure Advisory Council to address distribution transformer design, demand, and manufacturing, major drivers of demand, and OE's Interchangeability and Configuration Matrices. Mr. Howard noted that it would be helpful to have the EAC identify an appropriate venue for the Matrices, and that OE needs volunteers to implement the Matrices at a fundamental level.

Presenter slides can be found online via the link provided in the Meeting Overview section above.

Discussion

Alison Silverstein asked Mr. Howard why OE is not approaching manufacturers regarding distribution transformers.

Dave Howard responded that OE involved manufacturers in the last half of the process and spoke to them independently to obtain open responses. Manufacturers notes that they would make what customers request. Regional groups could make requests for regional distribution transformer configurations, which would necessitate stakeholders agreeing on the configuration and the impact on the region.

Assistant Secretary Rodrigues responded that there is a need to manufacture for the existing grid. Some specifications on distribution transformers are too customized, while other specifications are necessary. The OE team ensured that as they looked at common configurations, they also consulted with manufacturers about what would drive down manufacturing time. OE is focusing on progress

with the existing utility system.

Mark Gabriel noted that Congress tried to address this issue in 2015 by creating a strategic transformer reserve, but the attempt failed. He urged OE to revisit this approach.

Assistant Secretary Rodrigues responded that OE worked with DOE's Office of Policy and other stakeholders to develop a plan to create market certainty rather than a reserve of transformers. This would enable DOE to have buying authority for any distribution transformers that could not sell. Then, DOE would work to re-sell and distribute those transformers on a less constrained timeline. DOE would need appropriations to do this.

Mark Gabriel noted that previously, the electric industry placed the burden on the manufacturer to meet demand for distribution transformers. This resulted in the manufacturer only building to order which contributed to the shortage.

Assistant Secretary Rodrigues responded that DOE is working with the single domestic manufacturer to modernize the plant. In August 2024 the manufacturer invested $18 million to modernize its plant and increase throughput.

Deepak Divan noted that several companies are building holistic transformers that provide direct current output. These transformers are fully bidirectional. Dr. Divan suggested that DOE examine this as a possible solution since it removes a large portion of transformer manufacturing.

Larry Bekkedahl asked what the problem that is trying to be solved on distribution angle. He mentioned that during COVID there was a shortage of transformers, this is back on track now. There is a shortage of higher-level transformers. Data centers are outpacing us. There is a need for larger units.

Jennifer Chen inquired how the demand estimate would change if the grid was optimized more effectively and whether there are ways to standardize to more efficient versions of distribution transformers.

Rebecca Ward responded that in the Supply Chain Readiness Level, MESC is trying to identify constraints and non-construction alternatives; grid optimization and policy recommendations are part of this exercise.

Kirsten Verclas asked how DOE is considering engaging stakeholders in the Supply Chain Readiness Level exercise.

Rebecca Ward responded that MESC has not yet aggregated or analyzed findings of the battery Supply Chain Readiness Level exercise. MESC would like to share these findings with utilities, the private sector, and other sectors so they can make informed decisions.

Paul Stockton noted that the U.S. grid has many Chinese components. From a security perspective, and should prohibition orders occur, the U.S. will need to phase in a bolstered and safer supply chain. Mr. Stockton asked how DOE is considering this issue.

Rebecca Ward responded that one of MESC's priorities is to cut lithium from China, and that

MESC examines products' origins and whether they come with inherent risks. Component and subcomponent security is integral to the Supply Chain Readiness Level's model and analysis.

Karen Wayland asked which long-term mechanisms DOE is putting into its supply chain work to inform program administration. If milestones become problematic to grantees because of extenuating circumstances, grantees should not be penalized.

Rebecca Ward responded that MESC follows milestone-based grants. There is community benefit component integrated into the grant application, namely in where workforce is sourced. Grantees should have a workforce plan at the outset of grants. MESC is invested in the success of grantee projects and can work directly with grantees to determine potential obstacles. Additionally, MESC aims to create a network amongst grantees to enable information sharing. This will take additional time.

Mario Hurtado noted that pricing or market failures can stem from how the manufacturing industry is organized and asked whether DOE's work includes mechanisms that allow for market solutions.

Rebecca Ward responded that MESC put out a Request for Information on this issue in early 2024. Ms. Ward agreed that there is not a coherent industrial policy on manufacturing capacity.

Assistant Secretary Rodrigues responded that better functioning markets are needed for more enduring change. In the near term, the National Laboratories can assist by solving near-term issues to provide better information and improved certainty in the free market, by analyses like projecting year-to-year demand. The Federal government's role is to use incentives, policies, and guidance to move the market in a direction to serve all American people. The EAC can help advise OE and DOE in this realm.

Gil Bindewald responded that the Federal government is also a procurer in this issue and raised the question of how the Federal government can better model behavior for the market.

Andrew Barbeau asked whether MESC did a side-by-side analysis of how much energy storage is needed and whether that amount is feasible, and whether MESC coordinated with OE's Energy Storage Division on this issue.

Rebecca Ward responded that MESC is working on the side-by-side analysis on an ongoing basis.

Andrew Barbeau asked whether there are emerging areas of supply chain challenges that EAC members would like to raise to DOE's attention.

Deepak Divan noted that many new decisions have similar access issues to silicon carbide.

Tom Kuhn noted that he is only aware of one U.S. manufacturer that makes battery controls.

Jennifer Chen noted sub-sea cables to exchange electricity between islanded nations and jurisdictions.

Paul Stockton noted benefits in component diversity to avoid a common mode of failure.

Deepak Divan noted the workforce gap surrounding the understanding of new technologies.

Presentations and Facilitated Discussions on Resilience, Reliability, and Risk

Bill Parks, DAS, OE, introduced the OE panel and summarized changes in the grid anticipated in the next decade, including growing asset stress, increased variable generation, increasingly dynamic markets, new controllable assets, increased grid edge activity, and massive data and computational advances. He noted that the panel would discuss how these developments change the reliability, resilience, and risk paradigms in the energy sector. In this session, Joe Paladino, Senior Advisor, OE, Bahram Barazesh, Principal Power Systems Engineer, OE, and Roshi Nateghi, Program Manager, OE, presented on different elements of resilience, reliability, resource adequacy, and risk.

Presenter slides can be found online via the link provided in the Meeting Overview section above.

Discussion on OE's Evaluation of Grid Performance

Joe Paladino summarized the report-in-draft evaluating the performance of the grid. The report considers the application development of metrics, standard methods for calculating potential costs and measurable benefits, and the roles of states and regulatory bodies, and identifies tools, resources, and models that may improve performance. The report assesses the performance of the grid against a series of reliability, resilience, flexibility, energy efficiency, environmental impact, cybersecurity, and affordability metrics, among others. The report also notes how new technologies are integrated and their impact on grid performance. Mr. Paladino noted several takeaways:

- While many metrics are applied consistently, analytical methods to develop metrics vary.
- Decision processes used to set performance metrics and measure performance are evolving. These processes are largely determined by state processes and vary widely across the country.
- Standardization can be challenging given variability across states and stakeholders.
- Determining the value of technologies needs to evolve to reflect existing interdependencies.

Mr. Paladino noted that communities, stakeholders, and states need to develop goals and then work with regulators to determine actionable objectives. Mr. Paladino then summarized findings from the North American Electric Reliability Corporation (NERC) 2023 Long Term Reliability Assessment and 2024 State of Reliability Reports and presented data from the National Oceanic and Atmospheric Administration on extreme weather events in the last 10 years. He then discussed issues with resilience planning and affordability.

Karen Wayland asked how OE envisions DOE's energy security planning, state resilience planning, and state distribution planning working together.

Joe Paladino responded that DOE components have worked on developing standardized resilience planning and noted an exemplar Hawaii resilience plan. DOE is trying to help translate security

plans into guidance for investment. He added that resilience planning is separate from state security plans—it is broader.

Todd Lucas noted that if the industry does not have good models for these new resources, system planners cannot respond productively since they do not know how these resources will behave.

Joe Paladino responded that modeling is key to the industry understanding the impact of potential investments and related grid performance.

Deepak Divan noted, within the framing of bulk-level markets and distribution-level markets, the continued need to back up inverter-based resources with variable resources. He also noted the continued need to address affordability.

Kirsten Verclas noted that all states are required to develop state energy security plans and must include six required elements, including two risk assessment and mitigation elements. States face the challenge of obtaining local data on climate change and how that affects grid investments, behavior, and other factors. There is a disconnect between utilities using proprietary modeling systems and the ability of others to understand utilities' assumptions. She noted the need to better define which investments should be borne by tax and ratepayers.

Mark Gabriel noted an opportunity for DOE to help smaller utilities with oversight or a tool regarding security and resilience plans and reporting.

Joe Paladino responded that DOE has the potential ability to do this through an existing partnership with NRECA.

Richard Meyer asked which types of resilience metrics were considered in the 8009 study and noted that current reliability metrics do not apply to resilience and can be inconsistently applied. He also asked how DOE is considering planning with variable resources.

Joe Paladino responded that there is a need to examine planning in a holistic manner, and this is not happening consistently across the country. Regarding resilience and reliability metrics, the report prioritizes power outages, their frequency, and duration across a variety of event types.

Discussion on Prior EAC Recommendations, Reliability Workshop, and Resource Adequacy Considerations

Bahram Barazesh presented on prior EAC recommendations and corresponding DOE responses, a summary of OE's recent reliability workshop, the transformation of resource adequacy requirements, and OE's plans moving forward regarding these topics. He noted that the reliability workshop had 23 participants from Regional Transmission Organizations and Independent System Operators, utilities, cooperatives, industry groups, consultants, National Laboratories, states, NERC, and the Federal Energy Regulatory Commission. The groups discussed reliability challenges, factors impacting reliability, and resource adequacy.

Lauren Azar noted that standards are needed to gain uniformity across states. Standards would also help solve who pays for what and lessen the debate around the cost-benefit of implementing best practices because stakeholders would have to meet standards.

Bahram Barazesh responded that standards take significant time to develop, and resource adequacy practices must be implemented on a faster timeline than standards development. DOE can use its convening power to bring regional and interregional stakeholders together to address this issue.

Mark Gabriel said that in addition to security, reliability, and availability, quality is important for industrial stakeholders.

Bahram Barazesh responded that current IEEE standards capture outages that last longer than five minutes which does not capture the impact of shorter-term outages on industrial stakeholders.

Greg Poulos asked whether barriers to using mixed resources is in the framework as well.

Bahram Barazesh responded that standards are needed on quality. Additionally, OE is thinking about state and regional policies and entities such as regional transmission organizations. He noted the need to plan longer-term and that type of planning is within the purview of the states.

Jay Morrison asked whether DOE is willing to examine legacy issues for which industry stakeholders did not previously understand implications.

Bahram Barazesh responded that it is important to scope issues comprehensively and solve problems as needed.

Jennifer Chen noted that additional information on methodology and scenarios would be helpful to help the EAC understand whether input from stakeholders is incorporated. This would be helpful for stakeholders to understand whether modeling is realistic.

Bill Parks noted that OE also has a grid modeling group that does outreach to states and regions to better understand considerations such as regionality.

Alison Silverstein noted that customer and community considerations such as customer behavior do not seem to be included, and DOE should consider how to protect customers and communities from failures.

Bahram Barazesh responded that the customer is a pillar of reliability. The value that the customer places on electricity and impact on quality of life is all encapsulated in OE's work although these details were not included in the presentation.

Joe Paladino responded that OE incorporates stakeholders in planning to help determine critical priorities, and this is a process that OE should institutionalize.

Discussion on Grid Resilience

Roshi Nateghi presented on benchmarking, tracking, and enhancing grid resilience. She noted that OE wants to avoid legacy issues and a system in place with an expansive view that avoids blind spots for future. OE is harnessing a three-pronged approach for understanding resilience

- Comprehensive literature review and knowledge synthesis
- Stakeholder Engagement

- Engagement with resilience initiatives across DOE and the federal government

This approach will culminate in OE's vision document for resilience. She defined the operationalization of resilience as the capacity of complex systems to:

- Cope with events
- Respond or reorganize in ways that maintain their essential function and/or structure
- Maintain the capacity for learning, adaptation, and transformation

Dr. Nateghi noted that the industry does not have many metrics related to adaptation and transformation and emphasized the importance of providing a set of resilience metrics that localities and take and use to measure their specific scenarios, among other topics.

Andrew Barbeau asked whether these conversations are internal or if they involve stakeholders. He said that the evolving resource adequacy metrics discussion and resilience planning should involve states and utilities.

Joe Paladino responded that some stakeholder engagement occurs at the literature review phase to identify gaps and attempt to standardize.

Bahram Barazesh responded that not all resource adequacy discussions have reached participants. OE is hoping to extend these conversations and possibly create a working group. The EAC is welcome to participate in such a working group.

Roshi Nateghi responded that OE informally works across stakeholders through workshops, program reviews, and other ongoing coordination measures. OE recognizes the importance of planning alongside experts, stakeholders, and other industry entities.

Gil Bindewald responded that part of the purpose of bringing the panel together is in acknowledgment that electric reliability requires a multidisciplinary set of stakeholders and considerations. OE is identifying how reliability has been approached across stakeholder groups, associated learning gaps, and hopes to use those findings to develop scalable and actionable frameworks.

Greg Poulos acknowledged the importance of risk science in this discussion. Identifying which stakeholder bears the risk is very important. Customers do not have the same capacity to manage risk as industry stakeholders. He noted that it would be helpful for OE to frame problems with resilience in customer-centric language.

Roshi Nateghi responded that OE does consider which stakeholder group bears risk but can do more thinking regarding the customer-centric aspect of this consideration. Continued access to electricity is what matters for communities and OE aims to measure that.

Lisa Frantzis asked Roshi Nateghi whether OE has been coordinating with Tapestry or GoogleX in their data gathering regarding artificial intelligence and machine learning.

Roshi Nateghi responded that OE has not conducted formal coordination with those entities but does track their activities.

Deepak Divan noted that all customers have different assets and questioned the interoperability of those assets. DOE leadership in setting technology agnostic specifications would be impactful.

Milo Blair noted that the way Roshi Nateghi presented to the EAC is how OE should engage with the industry.

Subcommittee Updates

GRNS: Paul Stockton noted that the subcommittee will distribute GRNS whitepapers to the broader EAC in February 2025.

Energy Storage: the Energy Storage Subcommittee continues work on the 2024 Biennial Energy Storage Review and anticipates finalizing the report in February 2025.

The Smart Grid Subcommittee did not have updates at the time of this meeting.

Public Comments

No public comments were submitted for this meeting.

Wrap-up and Adjourn November 2024 Meeting of the EAC

Andrew Barbeau summarized key points from the presentations and following discussions. He noted the following items for further EAC focus:

- Engaging with the evolving resource adequacy metric to potentially develop a model and identifying where DOE is willing to engage EAC in those discussions
- Engaging with and taking input from local resilience planning communities and integrating this input into models that can be more widely disseminated
- Identifying where EAC input could be helpful in developing the resilience matrix and integrating a customer focus to resilience
- Focusing on anticipated large power transformer shortages

He then opened the floor for final comments from EAC members.

Lisa Frantzis noted that it would be useful to meet with DOE at the outset of work products to ensure EAC topics are relevant and timely.

Deepak Divan noted the need to define in non-technical terms the ‘north star’, or end goal that OE is working towards to integrate various facets of planning and not lose existing or past investments in grid assets.

Lauren Azar asked Andrew Barbeau to clarify for new members how to determine where their topics belong in subcommittees since the subcommittee names indicate both limited scopes and overlapping jurisdictions.

Andrew Barbeau notes that despite subcommittee names, there is proper delineation in subcommittee content and members can create sub-subcommittees for ad hoc topics that do not fit cleanly within one subcommittee. Mr. Barbeau then adjourned the meeting and thanked Assistant Secretary Rodrigues for his time and service to the country and to the EAC.

Assistant Secretary Rodrigues thanked the EAC for their engagement.

Signature Page

Respectfully Submitted and Certified as Accurate,

Andrew Barbeau

Andrew Barbeau
Chair
DOE Electricity Advisory Committee

2/4/25
Date

Jayne Faith

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

2/4/25
Date