



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

**National Rural Electric Cooperative Association Conference Center  
Arlington, Virginia  
October 26, 2022**

**Day 1 Meeting Summary**

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## Day 1 Participants

### Electricity Advisory Committee Members

SHARON ALLAN  
Smart Electric Power Alliance (Retired)

CHRISTOPHER AYERS  
North Carolina Utilities Commission Public  
Staff

LAUREN AZAR  
Azar Law, LLC

ANDREW BARBEAU  
The Accelerate Group, LLC

TOM BIALEK  
Toumetis

DANIEL BROOKS  
Electric Power Research Institute

JENNIFER CHEN  
ReGrid

ROBERT CUMMINGS  
Red Yucca Power Consulting

KIMBERLY DENBOW  
American Gas Association

DREW FELLON  
Alliance Advisory Services

LOUIS FINKEL  
National Rural Electric Cooperative  
Association

LISA FRANTZIS  
Guidehouse

HOWARD GUGEL  
North American Electric Reliability  
Corporation

BRIAN HARRELL  
Avangrid

DAVE HERLONG  
NextEra Energy

PHIL HERMAN  
Elio Energy Group

MICHAEL HEYECK  
The Grid Group, LLC

MARIO HURTADO  
LUMA Energy, LLC

LYNNE KIESLING  
University of Colorado Denver, College of  
Engineering, Design and Computing

CLAY KOPLIN  
Cordova Electric Cooperative

BRIAN LIPSCOMB  
Energy Keepers, Inc.

REP. NICOLE LOWEN  
Hawaii House of Representatives

MONICA MARTINEZ  
Ruben Strategy Group, LLC

JESSICA MATTHEWS  
Uncharted Power, Inc.

JAY MORRISON  
ElectriCities of North Carolina, Inc.

RICHARD MROZ  
Resolute Strategies, LLC

DON PARSONS  
Georgia House of Representatives

DARLENE PHILLIPS  
PJM Interconnection, LLC

WANDA REDER  
Grid-X Partners, LLC

PAUL STOCKTON  
Paul N. Stockton, LLC

RAMYA SWAMINATHAN  
Malta Inc.

TOM WEAVER  
American Electric Power Company, Inc.  
(Retired)

[Registered U.S. Department of Energy  
\(DOE\), National Laboratories, and  
Power Marketing Administrations](#)

GIL BINDEWALD  
Office of Electricity, U.S. DOE

SAMUEL BOCKENHAUER  
Office of Energy Efficiency and Renewable  
Energy, U.S. DOE

NOLAN BRICKWOOD  
Office of the General Counsel, U.S. DOE

ADRIA BROOKS  
Grid Deployment Office, U.S. DOE

SAM CHANOSKI  
Idaho National Laboratory

MICHAEL COE  
Office of Cybersecurity, Energy Security,  
and Emergency Response, U.S. DOE

JAYNE FAITH  
Office of Electricity, U.S. DOE

ALI GHASSEMIAN  
Office of Electricity, U.S. DOE

IMRE GYUK  
Office of Electricity, U.S. DOE

CHARLES HANLEY  
Sandia National Laboratories

ERIC HSIEH  
Office of Electricity, U.S. DOE

HENRY HUANG  
Office of the Undersecretary for Science and  
Innovation, U.S. DOE

SANDRA JENKINS  
Office of Electricity, U.S. DOE

CHRISTOPHER LAWRENCE  
Western Area Power Administration

TRACEY LEBEAU  
Western Area Power Administration

TERRI LEE  
Office of Electricity, U.S. DOE

MARC LEMMOND  
Office of Cybersecurity, Energy Security,  
and Emergency Response, U.S. DOE

KEVIN LYNN  
Office of Energy Efficiency and Renewable  
Energy, U.S. DOE

JOSEPH PALADINO  
Office of Electricity, U.S. DOE

FERNANDO PALMA  
Office of Electricity, U.S. DOE

MARIA ROBINSON  
Grid Deployment Office, U.S. DOE

JESSE SCHNEIDER  
Grid Deployment Office, U.S. DOE

ADAM SHAPIRO  
Office of Congressional and  
Intergovernmental Affairs, U.S. DOE

BENJAMIN SHRAGER  
Office of Electricity, U.S. DOE

ANNA SIEFKIN  
Office of Technology Transitions, U.S. DOE

MERRILL SMITH  
Office of Electricity, U.S. DOE

KERRY WORTHINGTON  
Office of Energy Efficiency and Renewable  
Energy, U.S. DOE

[Registered Speakers, Guests, and  
Members of the Public](#)

JANICE CEPERICH  
U.S. Government Accountability Office

RACHEL COHEN  
GuidePost Strategies

STEPHANIE CRAWFORD  
National Rural Electric Cooperative  
Association

MELISSA CROCKER  
Malta, Inc.

KARDELEN ERGUL  
Holland & Knight

ASAD GHORI  
PricewaterhouseCoopers LLP

DAVID GROARKE  
Indigo Advisory Group

JUDITH HAFNER  
Vantage Point Strategies

MIKE HANCOCK  
Ansys, Inc.

JOHN HOWES  
Redland Energy Group

ANN KULIKOFF  
Oneida Engineering Solutions Group

DAVID MEYER  
Grid Analytics

ELIZABETH NOLL  
Holland & Knight

GUS NORRBOM  
U.S. House Committee on Science, Space,  
and Technology

THERESA PUGH  
National Association of Manufacturers

TRACEE RHODES  
ONE Gas

NOAH STRAND  
American Council on Renewable Energy

NICK TOBENKIN  
Quanta Services

XIAOYU WANG  
Enel Green Power

JULIAN YOWELL  
Vogel Group

[Registered ICF/Support](#)

ANNA BOOTH  
ICF

DANIEL GRAY  
ICF

GENE RODRIGUES  
ICF

JOSH SMITH  
ICF

BENJAMIN STAFFORD  
ICF

## Meeting Overview

The Electricity Advisory Committee's (EAC) third and final meeting of 2022 was held October 26 and 27 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, Gil Bindewald, Acting Principal Deputy Assistant Secretary (PDAS) for the U.S. Department of Energy (DOE) Office of Electricity (OE), provided an update on OE programs and initiatives. Maria Robinson, Director, DOE Grid Deployment Office (GDO), provided an update on GDO programs and activities. Charles Hanley, Senior Manager of the Grid Modernization and Energy Storage Group at Sandia National Laboratories, and Dr. Imre Gyuk, energy storage program manager at DOE OE, presented on DOE's energy storage activities. These presentations were followed by an Energy Storage Subcommittee update provided by Clay Koplín, Subcommittee Vice Chair; a presentation by Howard Gugel, EAC member and Vice President of Engineering and Standards at the North American Electric Reliability Corporation (NERC), on NERC's 2022 Winter Assessment; and a Grid Resilience for National Security Subcommittee update provided by the Chair and Vice Chair, Dr. Paul Stockton and Rob Lee, respectively.

All presentations, as well as recordings of the meeting, can be found at <https://www.energy.gov/oe/october-26-27-2022-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 and invited PDAS Bindewald to provide an update on OE's programs and initiatives.

## Update on DOE Office of Electricity Programs and Initiatives

PDAS Bindewald noted that DOE's reorganization was finalized in September 2022, including establishment of the Office of the Under Secretary for Infrastructure and the Office of the Under Secretary for Science and Innovation. As a result, OE now has three R&D divisions—Grid Systems and Components, Grid Controls and Communications, and Energy Storage—and the leaders and staff of each of these divisions will continue to engage with EAC to help address and tackle the challenges ahead. This restructuring will help ensure that OE successfully meets its mission to strengthen, transform, and improve the electricity system.

PDAS Bindewald outlined several OE priorities:

- The reliability of the bulk electricity system—“keeping the lights on”—is a top priority for OE. The office is supporting R&D on measurement and control of the electricity system to help mitigate widescale cascading blackouts.
- OE is focusing on new models and tools to help characterize the evolving system (as well as its interdependencies with other domains) and transfer that knowledge into the hands of industry. This includes using the integrated North American Energy Resilience Model to aid in energy planning, transmission planning, and contingency analyses.
- OE is working to enable seamless integration of grid resources across the system, developing new technologies and approaches to address the evolving characteristics of generation and load portfolios.
- OE is pursuing long-duration, megawatt-scale storage capable of supporting voltage and frequency regulation, ramping, and energy management for bulk and distribution power systems.

PDAS Bindewald said that, as part of the American-Made program,<sup>1</sup> DOE recently announced two prize opportunities. The Digitizing Utilities Prize<sup>2</sup> connects utilities with teams of software developers and data experts to transform digital systems in the energy sector for utilities. This prize is a direct result of past EAC recommendations. The Energy Storage Innovations Prize<sup>3</sup> tasks innovators to submit transformative approaches to grid-scale energy storage.

PDAS Bindewald concluded by inviting EAC to help DOE identify solutions for the challenges that the grid faces, including the following:

1. Maintaining grid reliability and resource adequacy.
2. Enhancing the inherent resilience and security of the electricity delivery system.
3. Better understanding the impact of transportation electrification.
4. Understanding the behavioral, decision science, and social science dimensions to reliability that go beyond the physics of the delivery of electricity.
5. Gaining a better understanding of energy equity and enabling the development of more effective strategies to address energy justice.
6. Developing pathways for addressing barriers to grid transformation.
7. Characterizing the workforce capacity and capabilities required.
8. Collaborating with others to help solve these issues.

## Discussion

Dr. Tom Bialek lauded DOE’s alternative approach to distributing funding in the form of the American-Made prizes. He described three data analytics challenges that he hopes the prizes will address—time synchronization of data across disparate datasets, standardization of data formats, and the proprietary nature of data that limits its usefulness.

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<sup>1</sup> <https://americanmadechallenges.org>

<sup>2</sup> <https://www.energy.gov/oe/articles/new-digitizing-utilities-prize-targets-data-experts>

<sup>3</sup> <https://www.energy.gov/oe/articles/new-energy-storage-prize-targets-disruptive-next-gen-innovation>

Dr. Lynne Kiesling added another data analytics challenge for DOE to consider—data availability and data access. Making more data publicly available and creating the protocols that govern how it is shared would improve the ability to conduct many kinds of research, including social science research.

Mr. Gugel said there needs to be a way to enforce grid-forming inverters on the system. Much of the new generation coming online does not have grid-forming capability.

Lisa Frantzis said she hopes DOE’s storage division will address the constraints on the availability of battery storage hardware.

Sharon Allan emphasized the importance of education for helping industry stakeholders understand the tools that DOE develops.

Dr. Jennifer Chen noted that demand-side resources are already available to help with emissions reductions and other near-term achievements; however, there is a limited understanding of how to operationalize them. She suggested that OE could help demonstrate the reliability of those demand-side resources.

#### *Questions and Answers*

**Q1.** Lauren Azar said she hopes DOE is working to fully model energy storage attributes and the solutions they can provide. Regional transmission organizations in the middle of the country are not fully utilizing energy storage because they lack the modeling to show all the solutions it can provide. Ms. Azar also noted that the electric utility industry is still using tools from the 20th century because they do not have full confidence in and understanding of the new 21st century tools. She asked how DOE might educate the industry about the new tools.

PDAS Bindewald said there are teams at DOE specifically focused on energy storage modeling and analysis. A challenge is translating the technical data into usable information for utilities and regulators. OE is working with Pacific Northwest National Laboratory to build the Grid Storage Launchpad, which will bring in stakeholders to demonstrate various grid storage technologies.<sup>4</sup>

PDAS Bindewald said DOE welcomes the EAC’s feedback on how to educate the industry and increase confidence in new grid technologies and tools.

**Q2.** Michael Heyeck asked which of the eight challenges that PDAS Bindewald identified would be most productive for the EAC to focus on.

PDAS Bindewald sees a need for greater understanding of the social science dimensions—the human dimension of the system rather than the physics-based dimensions (e.g., understanding the behavior of grid edge assets and developing mechanisms to ensure the accountability of those assets when called upon for reliability purposes). The economics associated with the social

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<sup>4</sup> <https://www.pnnl.gov/grid-storage-launchpad-pnnl>



science also are important. A better understanding of the reliability implications of the increasing interconnectedness of the grid with other industries is another area for the EAC to explore.

**Q3.** Rick Mroz asked how DOE coordinates with the Federal Energy Regulatory Commission (FERC) and state regulators. He referenced the joint FERC/National Association of Regulatory Utility Commissioners consortium on transmission.

PDAS Bindewald referenced the recently released Voices of Experience report,<sup>5</sup> which involved convening regulators from across the country and collecting their feedback. He added that there are other important stakeholders and decisionmakers with whom to engage, including cooperative and municipal power companies.

**Q4.** Andrew Barbeau asked how DOE can speed up the disbursement of funds and the development of planning tools. There is a gap between the speed at which the grid needs to evolve to meet decarbonization goals and the speed at which a large federal agency, like DOE, moves.

PDAS Bindewald said DOE's realignment will help the agency accomplish its goals quickly. OE, as a research-oriented office, looks at longer timescales. A significant part of DOE's role is also to build credibility into the newer tools and techniques being developed so that risk-averse electric utility entities will adopt them quickly.

## Update from the Grid Deployment Office

Ms. Robinson provided an update on GDO's programs and initiatives. Her remarks and presentation slides can be found online via the link provided in the Meeting Overview section above.

### Discussion

Mr. Heyeck said transmission investment is at a peak and there needs to be a better balance between transmission and distribution.

Kimberly Denbow said public opposition to the deployment of new grid infrastructure in their communities will be a major obstacle.

Ms. Robinson acknowledged that community engagement is crucial. DOE received \$716 million for the siting of interstate transmission lines.

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<sup>5</sup> [https://www.smartgrid.gov/voices\\_of\\_experience](https://www.smartgrid.gov/voices_of_experience)

### *Questions and Answers*

**Q1.** Mr. Gugel asked what Ms. Robinson thinks about interagency coordination and collaboration in the context of deploying funds to address such issues as hardening, resilience, and relocation.

Ms. Robinson said that, particularly through their work in Puerto Rico, DOE is becoming more familiar with the Federal Emergency Management Agency's processes as they relate to energy infrastructure.

**Q2.** Ms. Azar asked when DOE will officially designate national corridors in association with its National Transmission Needs Study.

Ms. Robinson said the Needs Study is a precursor and is currently under consultation with states and tribes. A draft will be released later this year for public comment and a request for information should be posted at the same time.

**Q3.** Ms. Azar asked, in reference to capacity contracts, whether they will be in non-regional transmission organization (RTO) areas.

Ms. Robinson said the language of the relevant legislative provisions largely precludes the inclusion of RTO areas.

## **Panel: Energy Storage**

### **Panelists**

- Charles Hanley, Senior Manager of the Grid Modernization and Energy Storage Group, Sandia National Laboratories
- Dr. Imre Gyuk, Office of Electricity, U.S. Department of Energy

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

### **Discussion**

Louis Finkel said energy storage should not be treated as a panacea; rather it is a useful time-shifting device.

### *Questions and Answers*

**Q1.** Ms. Azar asked about the inadequate market rules for long-duration storage and when DOE expects there to be market products available that can properly compensate long-duration storage.

Dr. Gyuk agreed that there needs to be market products, in addition to regulatory structures, to support long-duration storage.

**Q2.** Tom Weaver asked whether net zero goals depend on long-duration storage technologies that are not yet fully researched and commercially available.

Dr. Gyuk acknowledged that the goals are aspirational.

**Q3.** Dr. Chen referenced FERC Rule 841 and asked which characteristics of long-duration storage are not being valued by the rules that emerged from that order.

Dr. Gyuk said it is all about resource adequacy and noted that the current market rules work in the current market environment.

**Q4.** Dr. Chen referenced electric buses and the Bus-2-Grid initiative. She asked whether DOE could develop software that helps limit battery degradation.

Dr. Gyuk agreed that this type of software should be developed.

## **Energy Storage Subcommittee Update**

Mr. Koplín, Subcommittee Vice Chair, provided a status update on the Biennial Energy Storage Review. He described the focus areas of past reviews and explained the structure and focus of the current review. His remarks and presentation slides can be found online via the link provided in the Meeting Overview section above.

## **North American Electric Reliability Corporation (NERC) 2022 Winter Assessment**

Mr. Gugel provided an overview of NERC's 2022 Winter Assessment. The assessment found that a large portion of the U.S. bulk power system is at risk of insufficient electricity supplies during the upcoming winter months. The assessment recommends preparing for extreme cold weather events, taking action to ensure fuel availability, and preserving critical generation resources that are at risk of retirement.

### **Discussion**

Mr. Heyeck remarked that the energy transition will be hotly debated in the context of energy prices in Europe this winter. He also noted that reserve margins in the United States are far too low, around 12% or 15%, while the Iberian Peninsula has margins of 100%. He called for the development of a scenarios-based study that examines how to increase reserve margins and facilitate the energy transition. Mr. Barbeau supported the idea of a scenarios-based study.

Chris Ayers said if energy prices continue to rise, public support for the energy transition will diminish quickly.

Drew Fellon said gas and electric utilities need to follow their interruptible tariffs to ensure that the grid continues to serve the customers. Failure to follow those tariffs has caused huge problems for the grid. He added that industrial consumers are struggling to afford their electricity bills.

Ms. Allan said many state regulators do not fully understand the costs to utilities associated with resilience, reliability, and the energy transition, and she suggested that DOE could play a role in educating those regulators.

### *Questions and Answers*

**Q1.** Dr. Bialek asked whether NERC will be recommending mothballing critical generation resources as an alternative to retiring them.

Mr. Gugel said NERC will be recommending mothballing; however, it is ultimately a cost issue that utilities face in keeping the units available.

**Q2.** Mario Hurtado asked whether the assessment examined diesel fuel.

Mr. Gugel said most diesel generation that NERC looked at is relatively small and is used to provide black start capabilities. To his knowledge, there is not significant diesel generation anywhere in the generation fleet that NERC examined.

**Q3.** Dr. Kiesling asked what steps DOE could take to address system interdependencies.

Mr. Gugel said the North American Energy Standards Board, which works on market regulation, has a Gas-Electric Harmonization Committee. He noted that communications would be another key infrastructure for DOE to study in the context of system interdependencies.

PDAS Bindewald noted that DOE will be holding a series of workshops addressing cybersecurity and communications in the energy space.

**Q4.** Jay Morrison asked how to communicate to stakeholders that situations and scenarios that have been discussed for 15 years are now a reality.

Mr. Gugel said there are several helpful Institute of Electrical and Electronics Engineers' standards and requirements that did not exist before.

**Q5.** Dr. Kiesling asked whether there could be a better metric than reserve margins.

Mr. Gugel said NERC is currently working to develop standards around energy assurance.

## **Grid Resilience for National Security Subcommittee Update**

Mr. Lee provided an overview of subcommittee work products approved in 2021 and 2022. He provided an update on the ongoing resilience metrics effort, which will eventually result in the development of a work product. Mr. Lee said he would be producing a work product draft addressing the PIPEDREAM malware attack.

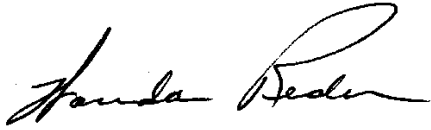
Dr. Stockton provided an overview of the Energy Sector Industrial Base (ESIB) initiative. He suggested that the EAC think about what industry-led governance process will be most useful for structuring ESIB.

## **Concluding Remarks**

Ms. Reder 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,



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

2/9/2023

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Date



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Michael Heyeck  
The Grid Group, LLC  
Vice Chair  
DOE Electricity Advisory Committee

2/1/2023

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Date



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

2/13/2023

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Date