

Welcome to the Fall Technical Workshop!



Debbie Lew
Executive Director, ESIG
Philadelphia, PA
Oct 27, 2025



ESIG Disclaimer



ESIG meetings, presentations and workshops provide a forum for the discussion, education and advancement of technical issues for the public good. Participants are presenting their personal viewpoints and are encouraged to consider a wide range of ideas to promote discussion, but do not necessarily represent the views of their employers, organizational affiliations, or ESIG. Any information presented or discussed at the workshops or meetings is for informational purposes only. ESIG accepts no responsibility for the accuracy of such presentations, or for your reliance on any information contained within the content.

A broad range of participants are welcome and encouraged to be actively involved including regulators, state energy offices, and consumer advocates, and a broad range of technical topics will be discussed. Ex parte information that is pending before a regulator will not be discussed, and regulators should raise concerns or excuse themselves from that portion of a meeting if the discussion inadvertently enters topics that could be of concern.

ESIG Antitrust Compliance Guidelines



It is ESIG's policy and practice to obey the antitrust laws and to avoid all conduct that unreasonably restrains competition. The antitrust laws make it important that event participants avoid discussion of topics that could result in charges of anti-competitive behavior, including: restraint of trade and conspiracies to monopolize, unfair or deceptive business acts or practices, price discrimination, division of markets, allocation of production, imposition of boycotts, exclusive dealing arrangements, and any other activity that unreasonably restrains competition. For additional guidelines, [please click here https://www.esig.energy/wp-content/uploads/2022/10/Antitrust-Compliance-Guidelines.pdf](https://www.esig.energy/wp-content/uploads/2022/10/Antitrust-Compliance-Guidelines.pdf).

ESIG Non-Discrimination / Anti-Harassment Rules



The Energy Systems Integration Group (ESIG) **does not tolerate** discrimination or harassment, which can take many forms, by its staff, members, meeting attendees, guests or other participants in any ESIG activities.

ESIG does not and shall not discriminate on the basis of race, color, religion (creed), gender expression, age, national origin (ancestry), disability, marital status, sexual orientation, or military status, in any of its activities or operations. These activities include, but are not limited to, hiring and firing of staff, selection of volunteers and vendors, and provisions of services. We are committed to providing an inclusive and welcoming environment for all members of our staff, volunteers, subcontractors, vendors and clients.

Harassment is any verbal remark, physical advance or visual display that makes another feel intimidated, offended or belittled. Harassment can be sexual or non-sexual in nature. Sexual harassment may include unwanted advances, inappropriate sexual jokes, sexually suggestive comments, touching, requests for sexual favors or inappropriate comments about another's appearance. Non-sexual harassment may include offensive comments, jokes or pictures related to race, religion, ethnicity, gender, age or any other protected characteristic. To keep harassment out of ESIG's environment, all comments and actions must always be appropriate and respectful.

What keeps grid operators up at night?



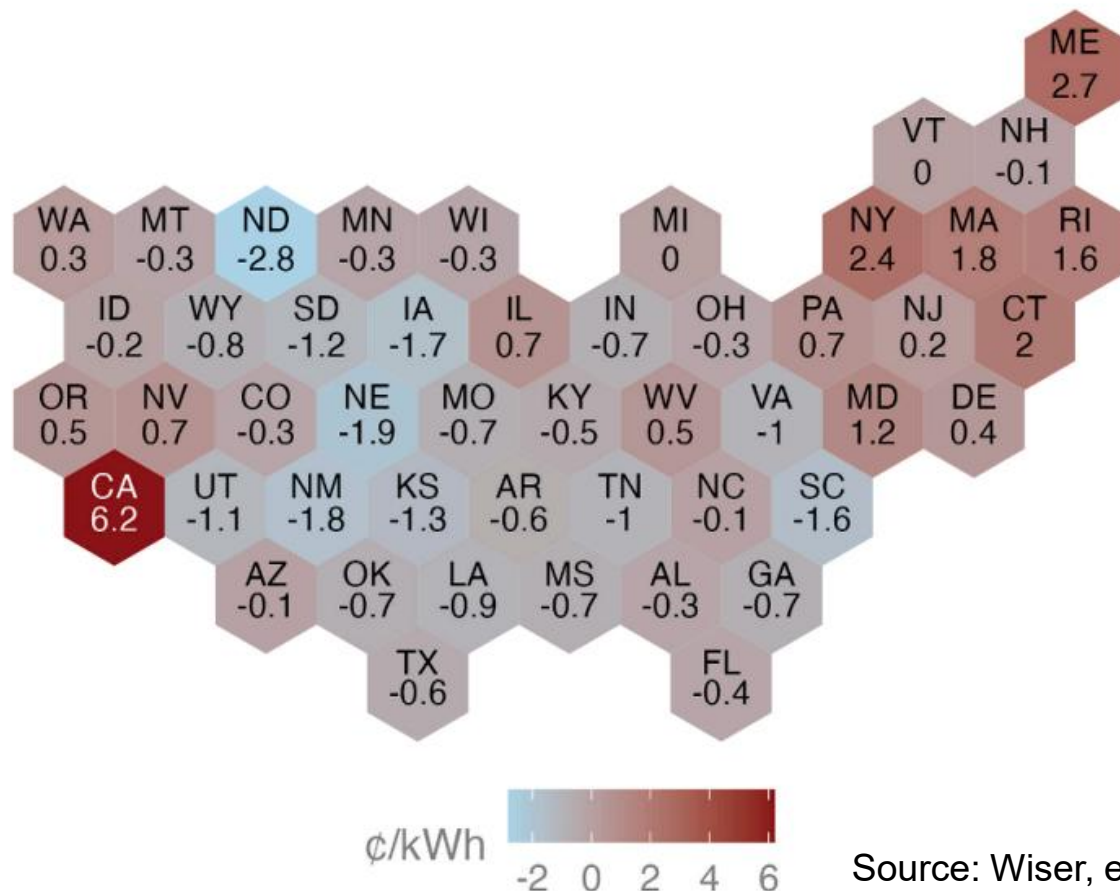
- Iberian peninsula blackout on April 28 – most severe in Europe in over 2 decades
- North Macedonia blackout on May 18
- Chilean blackout on Feb. 25
- We aren't used to seeing over-voltage events
- We need to study more grid conditions
- Inverter-based resources need to ride through disturbances



Average electricity prices are flat – if you account for inflation

But some states are seeing steep increases

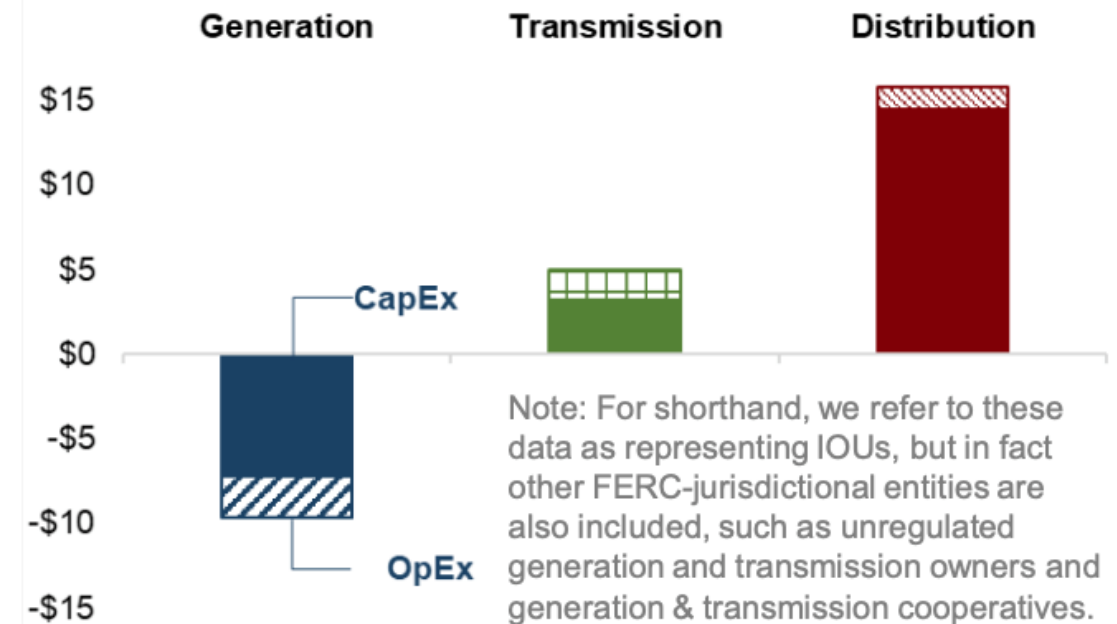
Change in Average Retail Electricity Price: 2019-2024



Spending on distribution (and transmission) has increased, in inflation-adjusted terms.

2019-2024 change in annual U.S. electric IOU expenditures

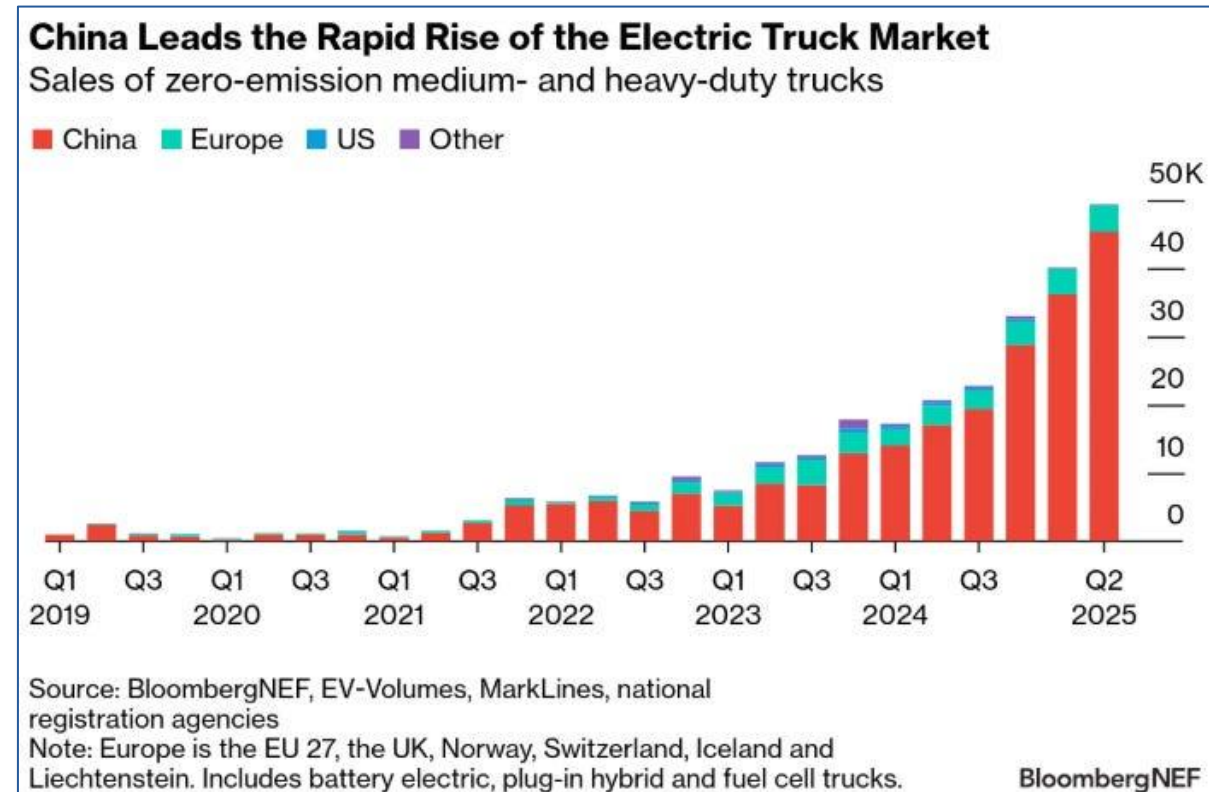
billions of 2024 U.S. dollars



While the US may be slowing down, other regions are ramping up



- Globally, we had more renewables generation than coal in the first half of 2025.
- China's BYD now has over 500 1 MW DC fast chargers that provide 250 miles of range in 5 minutes.
- China installed 210 GW of solar in the first half of 2025, bringing their total solar capacity to 1100 GW.
- India installed 30 GW of solar in the first 9 months of 2025.
- Europe's Clean Industrial Deal is mobilizing over €100B in an Industrial Decarbonization Bank to support EU clean manufacturing.



ESIG will be launching an international initiative for cross-learning and linkages to peers globally

Large Loads Task Force is underway (another reason to join ESIG!)



Project Teams

- Interconnection process Kyle Thomas
- Modeling requirements Parag Mitra
- Transmission Planning Warren Lasher and Hannes Pfeifenberger
- Resource Adequacy Derek Stenclik
- Markets Erik Ela and Beth Garza
- Interconnection performance requirements Ahmed Rashwan
- Load Forecasting John Wilson
- Data Collection Drew Siebenaler

Webinars

- Jon Koomey, formerly LBNL, on data center forecasting
- Andrew Isaacs, Electranix, on study concepts for data centers
- Briana Kobor, Google, on proposed interconnection process
- Rich Bauer, NERC, and Patrick Gravois, ERCOT, on data center event in VA and other events
- Sean Jones and Sai Gopal Vennelaganti, Tesla, on using BESS to mitigate oscillations and voltage ride through
- Shane Lunderville, Grant PUD, on interconnection processes at smaller utilities
- Casey Baker, GridLab, and Ryan Quint, Elevate, on large load interconnection guidance
- Kevin Steinberger and Kushal Patel, E3, on JLARC report examining impacts of data center growth in VA
- Dustin Howard, GE, on data center impacts on torsional stability of turbine-generators

ESIG Members – Join us at the Large Load Workshop on Thursday!

Upcoming ESIG Trainings – Interconnection Studies and EMT



Interconnection Studies Short Course

- November 17-19, 2025
- West Palm Beach, FL
- 3-day, in-person training
- Best practices for interconnection of inverter-based resources
- Day-to-day needs for interconnection studies
- Model quality tests; inverter-based resource models and simulations
- Managing study practices
- <https://www.esig.energy/event/esig-interconnection-studies-short-course/>

Electromagnetic Transient Training

- December 16-19, 2025
- Austin, TX
- 3-day, in-person training, sponsored by DOE/LBNL i2X
- Practical methods and best practices
- Hands-on practice with EMT simulations for interconnection and planning
- Managing study practices
- <https://www.esig.energy/event/esig-electromagnetic-transient-training/>

Thanks to NextEra and Texas Reliability Entity for hosting at their facilities!

Working Groups and Task Forces Structure



System Planning WG Josh Novacheck

Resilience Benefit
Quantification for
Transmission Planning TF

Warren Lasher

Net Zero Planning TF

Elaine Hart

Integrating Across
Siloes of Transmission
Planning TF

Ahmed Rashwan

Order 1920 Playbook
Task Force

Derek Stenclik/
Warren Lasher

Large Loads TF -
Transmission
Planning PT

Hannes Pfeifenberger/
Warren Lasher

Large Loads TF – Load
Forecasting PT

John Wilson

System Ops & Market Design WG Justin Sharp

Resource Adequacy
TF

Derek Stenclik

Large Loads TF –
Resource Adequacy PT

Derek Stenclik/
Aaron Schwartz

Large Loads TF – Market
Options & Operations PT

Beth Garza/Erik Ela

DER WG Obadiah Bartholomy

EV Load Forecasting
Guide TF

Matt Schuerger

Integrated Planning TF
(joint with SPWG&RWG)

Aaron Burdick

Large Loads TF

Sam Morris

Reliability WG Dustin Howard

GFM Testing PT

Shahil Shah

Oscillations PT

Nick Miller

Services PT

Matt/Julia/Deepak

i2X Forum for
Implementation of
Reliability Standards for
Transmission

Julia Matevosyan

Large Loads TF –
Interconnection Process PT

Kyle Thomas

Large Loads TF–
Interconnection Performance
PT

Ahmed Rashwan

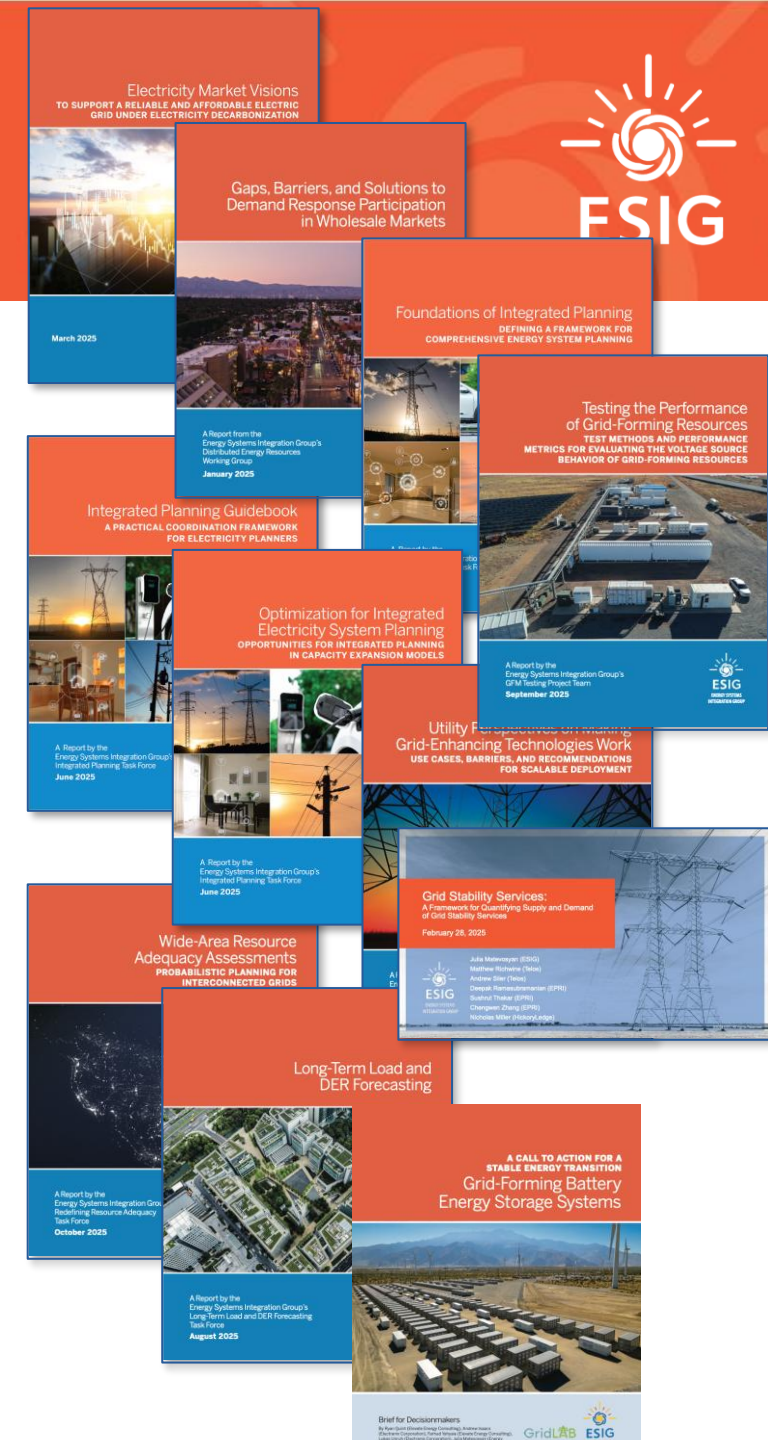
Large Loads TF – Modeling
Requirements PT

Parag Mitra

Research & Education WG Tom Acker

ESIG Task Force Reports in 2025

- [Electricity Market Visions](#) – visions for electricity markets to realize clean, affordable, reliable energy
- [Demand Response Participation in Wholesale Markets](#) – why demand response participation remains limited and how to unlock its potential
- [Foundations of Integrated Planning](#) – a framework for thinking about integrated planning
- [Integrated Planning Guidebook](#) – a practical guide for planners to consider other domains outside of their silo
- [Optimization for Integrated Planning](#) – considering optimization across generation, transmission and distribution
- [Grid-Enhancing Technologies](#) – accelerating adoption
- [Wide-area Resource Adequacy Assessments](#) – capturing coordination with neighboring systems
- [Long-term Load and DER Forecasting](#) – best practices in load forecasting
- [Grid Stability Services](#) – quantifying supply and demand of stability services
- [Testing the Performance of Grid-Forming Resources](#)
- [Benefits of Grid-Forming Batteries](#)



ESIG Task Force Reports in 2025

- [Electricity Market Visions](#) – visions for electricity markets to realize clean, affordable, reliable energy
- [Demand Response Participation in Wholesale Markets](#) – why demand response participation remains limited and how to unlock its potential
- [Foundations of Integrated Planning](#) – defining a framework for comprehensive energy system planning
- [Integrated Planning Guidebook](#) – a practical coordination framework for electricity planners
- [Optimization for Integrated Electricity System Planning](#) – opportunities for integrated planning in capacity expansion models
- [Grid-Enhancing Technologies Work](#) – use cases, barriers, and recommendations for scalable deployment
- [Wide-area Resource Adequacy Assessments](#) – probabilistic planning for interconnected grids
- [Long-term Load and DER Forecasting](#) – a framework for quantifying supply and demand of stability services
- [Grid Stability Services](#) – quantifying supply and demand of stability services
- [Testing the Performance of Grid-Forming Resources](#) – test methods and performance metrics for evaluating the voltage source behavior of grid-forming resources
- [Benefits of Grid-Forming Batteries](#) – a call to action for a stable energy transition

To be published very soon:

- Stress Testing Methods for Evaluating Resilience to Extreme Events
- Integrating Siloes of Transmission Planning
- EV Load Forecasting Guide
- Net Zero Electricity Planning



This week's agenda (Mon)



- Tutorial on Power System Needs and Services for High Shares of Inverter-based resources
- Jason Connell, Vice President of Planning, PJM
- Opening Plenary on Grid Events
- 6:30 – 8:30 pm Meet and Greet at Victory Brewing Company – See Lacey to sign up

This week's agenda (Tues)



Tuesday

- 7 – 8 am Breakfast
- 1A: Resources for Firm Capacity Services
- 1B: Managing Increasing Complexity in the Control Room
- 2A: Expediting Transmission Development
- 2B: Grid Operator use of AI and Advanced Methods within Power System Applications
- 12 – 1:15 pm Lunch
- 3A: Resource Adequacy Assessments for Large Geographic Regions
- 3B: Modernizing the Interconnection Queue: AI, Automation, and Process Reform
- 4A: Capacity Accreditation
- 4B: Integrated Planning with DERs
- 5:30 – 6:30 pm Student/Young Professionals Networking Reception with Professor Ben Hobbs
- 6:30 – 8 pm Main Reception

This week's agenda (Wed)



Wednesday

- 7 – 8 am Breakfast
- 5A: Flexibility Solutions in Distribution Systems
- 5B: Grid-forming Inverter Project Examples
- 6A: Finance and Investment
- 6B: Importance of In-The-Loop Testing for Model Validation
- 12 – 1:15 pm Lunch
- 7A: Collaborative Approaches to Planning
- 7B: Technical Challenges and Solutions with Integration of large Loads
- Closing Plenary Fireside Chat on the Future of Demand Flexibility

This week's agenda (Thurs/Fri)



Thursday

- 8 – 9:45 am Reliability Working Group
- 8 – 9:45 am System Operations and Market Design Working Group
- 8 – 9:45 am System Planning Working Group
- 10:15 am – noon DER Working Group
- 10:15 am – 5 pm Large Loads Workshop – Overview of task force, Flexibility, Load Forecasting and Transmission Planning
- 9 am – 5 pm EPICS Workshop on EPICS Research and EPICS Collaborations

Propose what you think ESIG should work on next!

Friday

- 8:30 am – 11:30 am EPICS Workshop on EPICS Research and EPICS Collaborations

Welcome to our International Participants!



- Belgium
- Canada
- Chile
- China and Hong Kong
- Germany
- Japan
- Norway
- United Kingdom



+ Welcome to those from the Great Nation of Texas!