
2025 Forecasting & Markets Workshop
NASHVILLE, TN
Opening Remarks
Mark Ahlstrom
ESIG Board President
Debbie Lew
ESIG Executive Director

ESIG Forecasting and Markets Workshop

ESIG
ENERGY SYSTEMS INTEGRATION GROUP

Debbie Lew
Executive Director, ESIG

June 24, 2025

Nashville, TN

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.

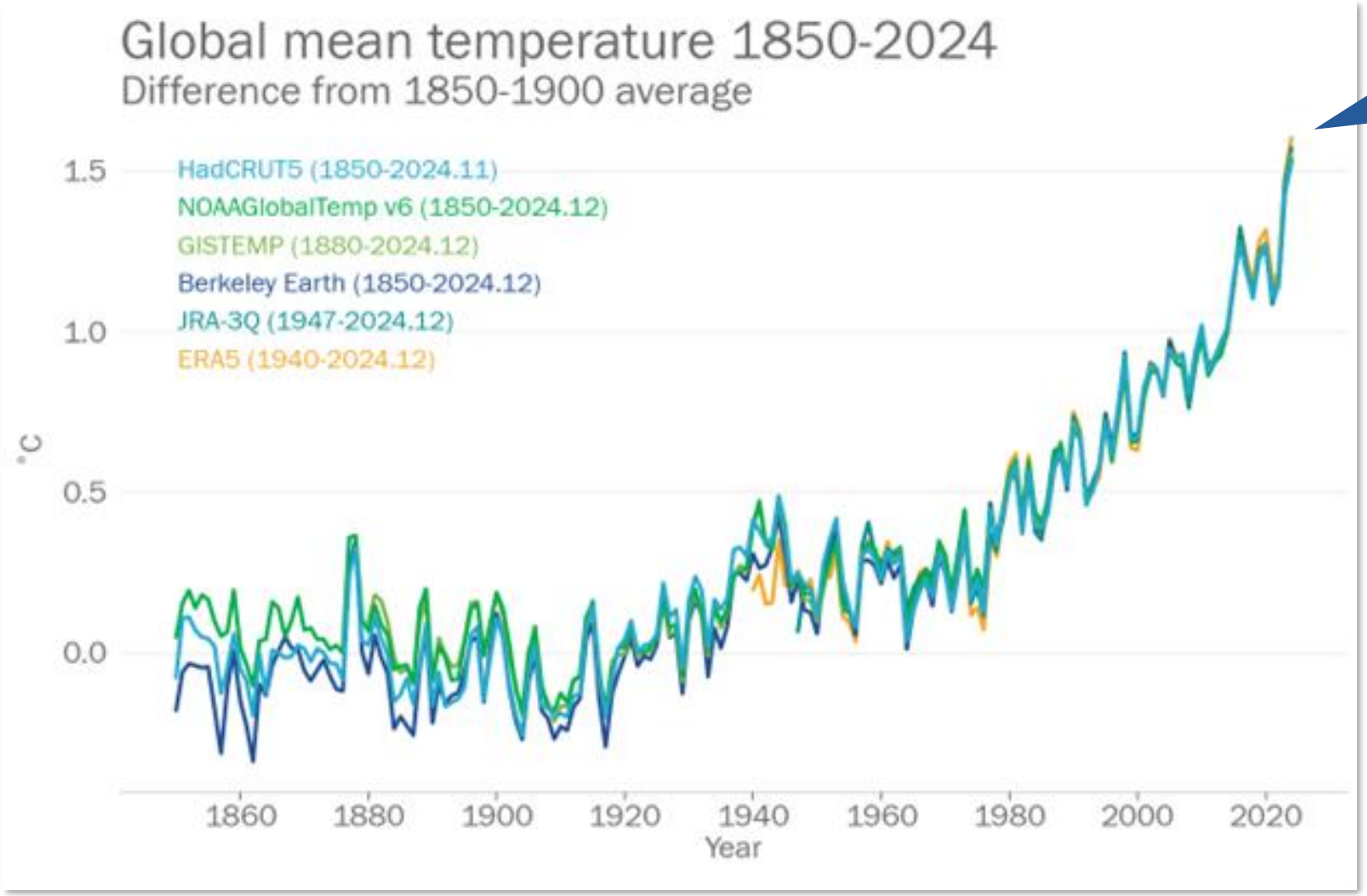
ESIG Non-Discrimination / Anti-Harassment

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.

Why are we here?



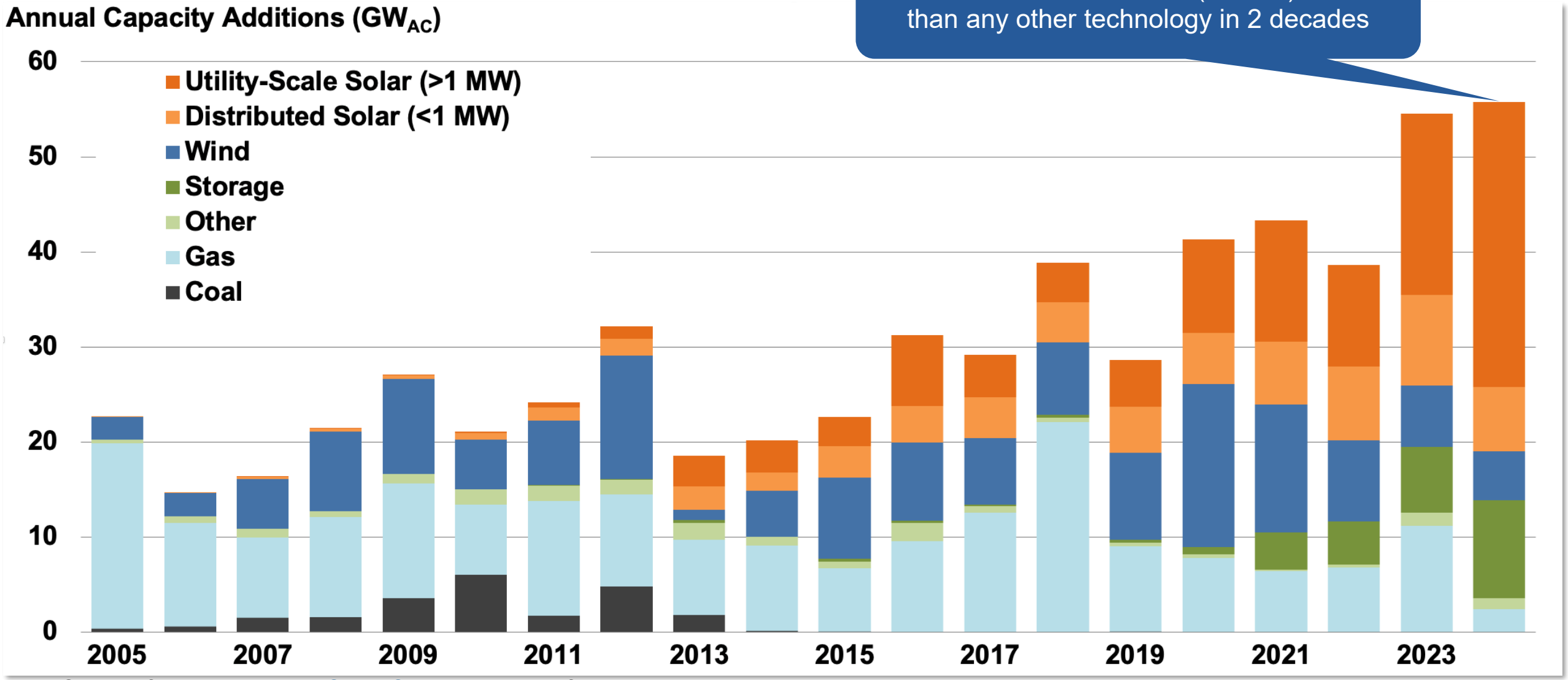
2024 Global mean temperature was 1.55C above pre-industrial levels

The ocean is the warmest it has ever been (as recorded by humans)

https://wmo.int/news/media-centre/wmo-confirms-2024-warmest-year-record-about-155degc-above-pre-industrial-level

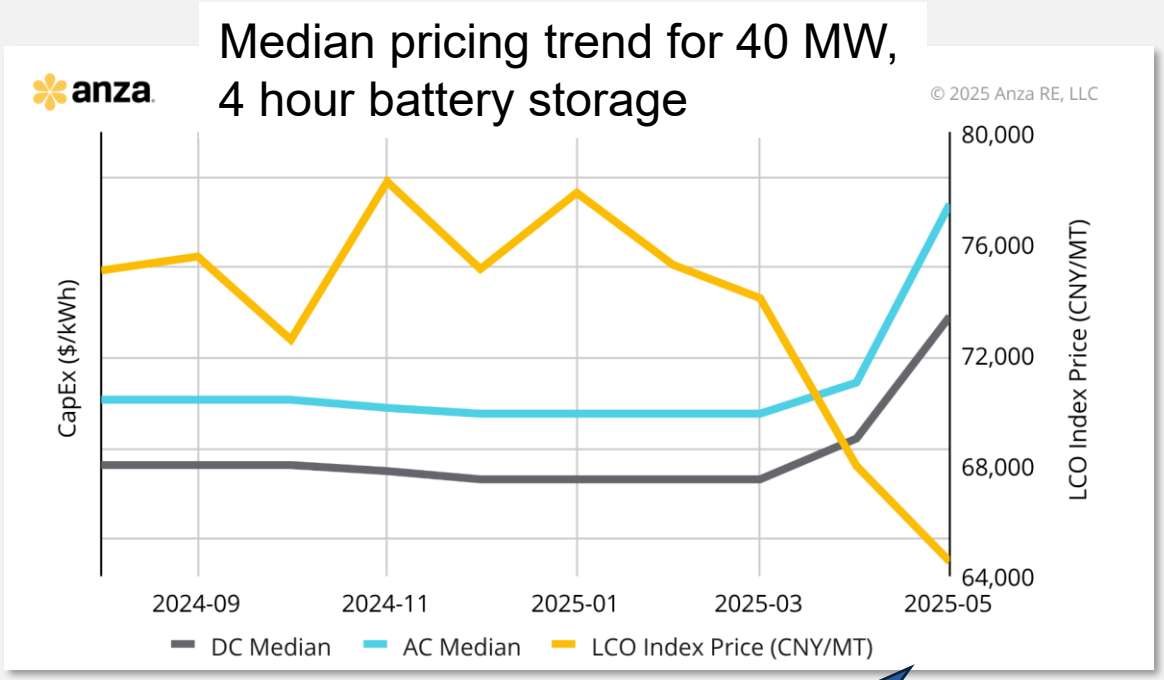
Progress in cleaning up the electricity sector

The US added more solar (30 GW) in 2024 than any other technology in 2 decades



Original from LBNL Utility-Scale Solar 2024, modified with 2024 EIA utility-scale and 2024 Wood Mackenzie distributed solar data

Huge uncertainty in import tariff impacts on equipment and clean energy tax credits



Battery prices rose 56-69% since January, while lithium prices dropped 17%.

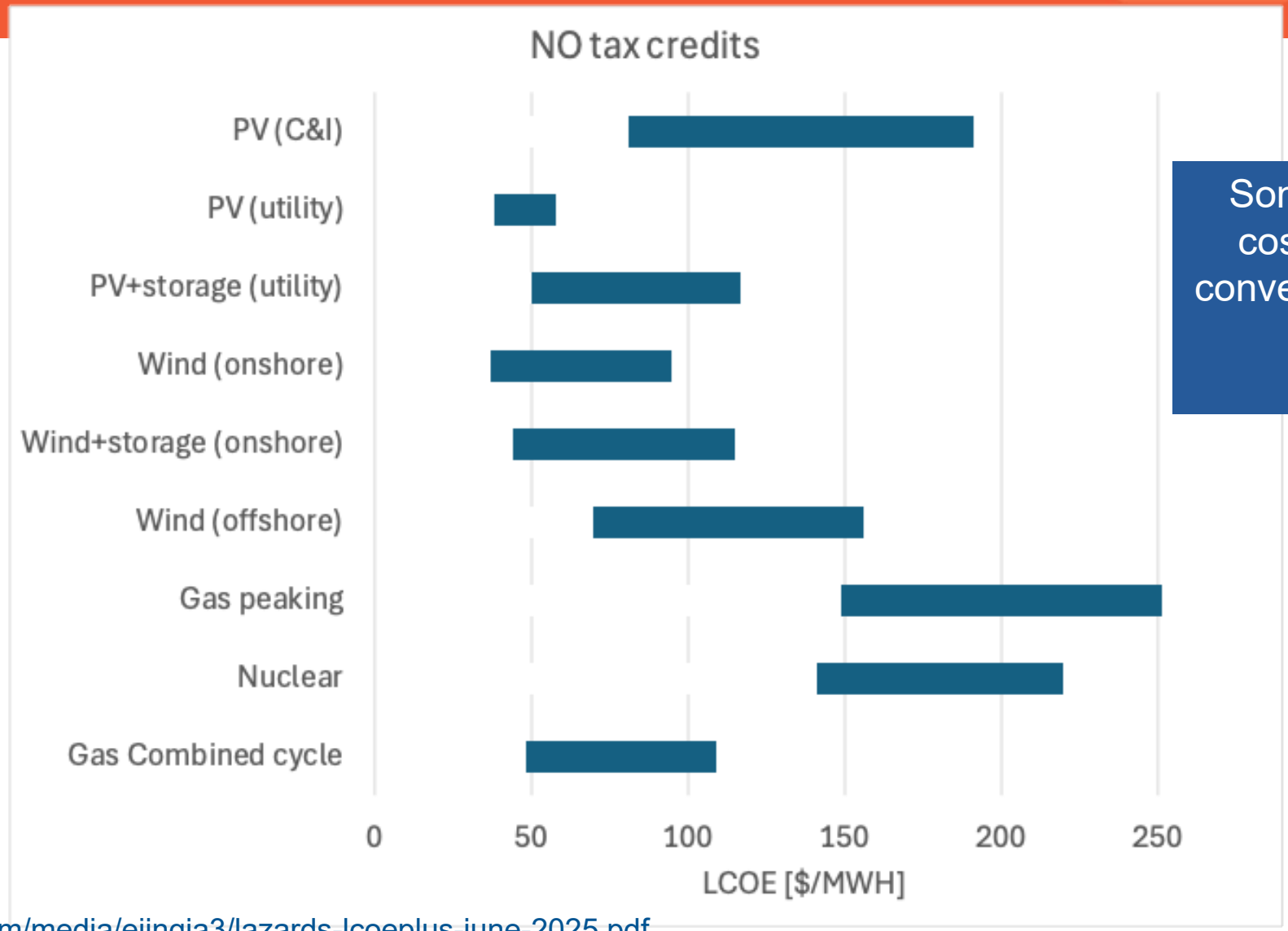
https://www.anzarenewables.com/energy-storage-pricing-insights/

The New York Times

A Clean Energy Boom Was Just Starting. Now, a Republican Bill Aims to End It.

- House passed budget bill on May 22:
  - Ends clean energy production credits (45Y) and clean electricity investment credits (48E) in 2028
  - Ends rooftop solar (25D) tax credits in 2025

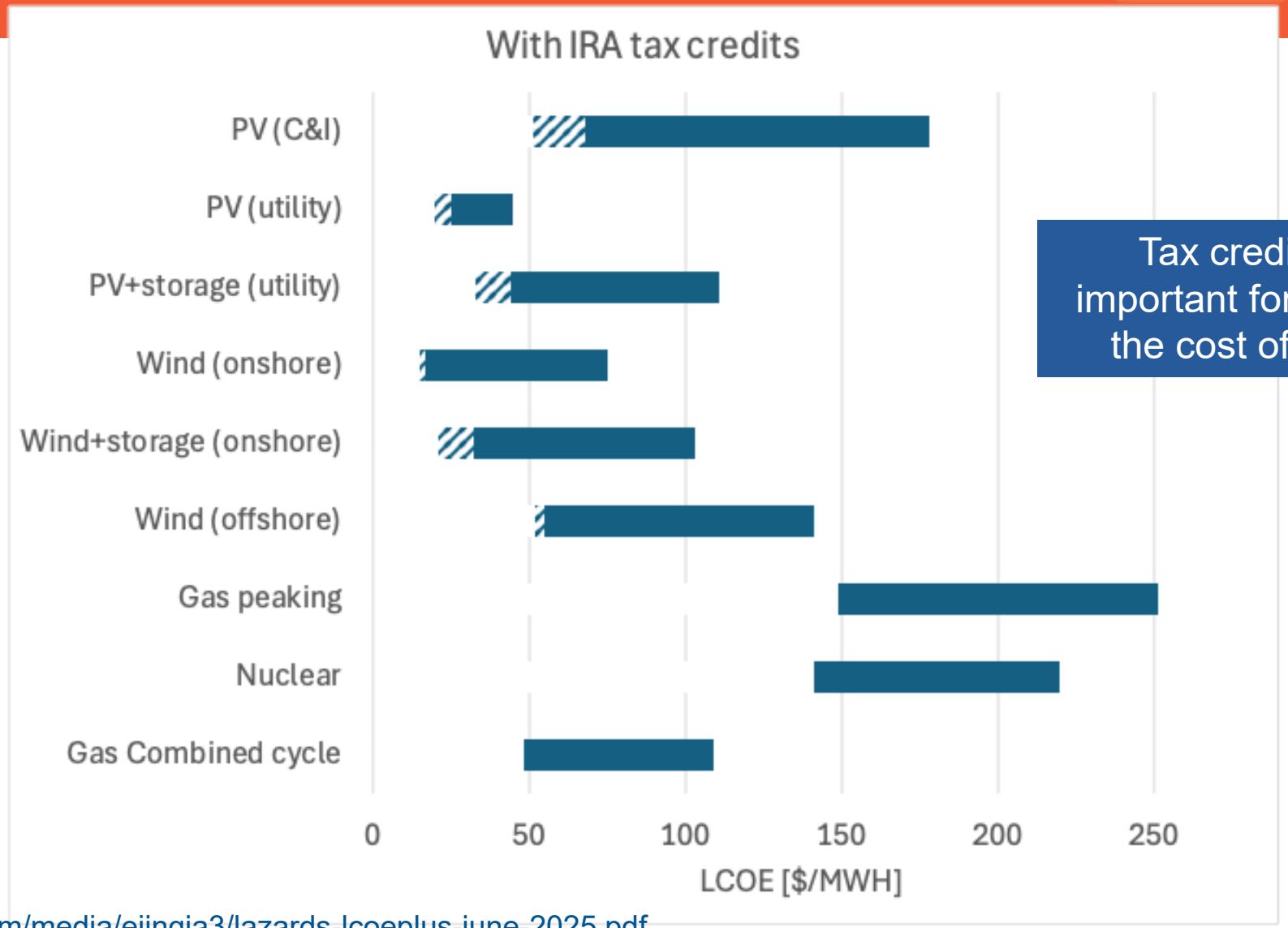
Lazard's newest levelized cost of energy analysis



Some renewables are cost-competitive with conventional technologies under certain circumstances

https://www.lazard.com/media/eijnqja3/lazards-lcoeplus-june-2025.pdf

Lazard's newest levelized cost of energy analysis

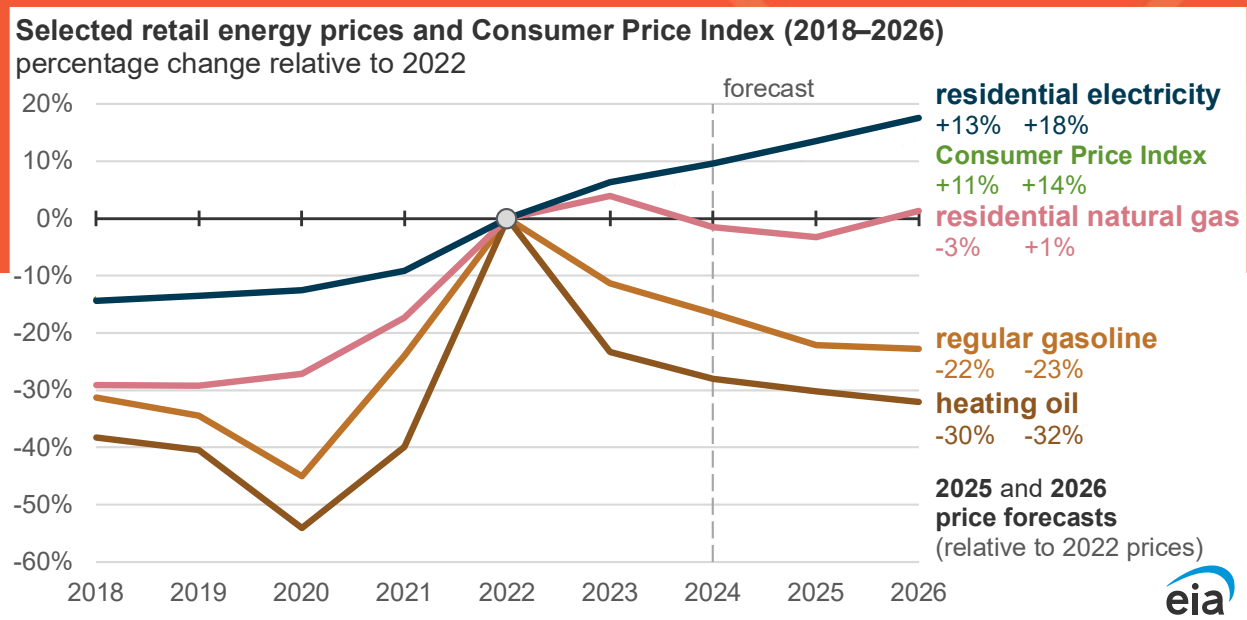


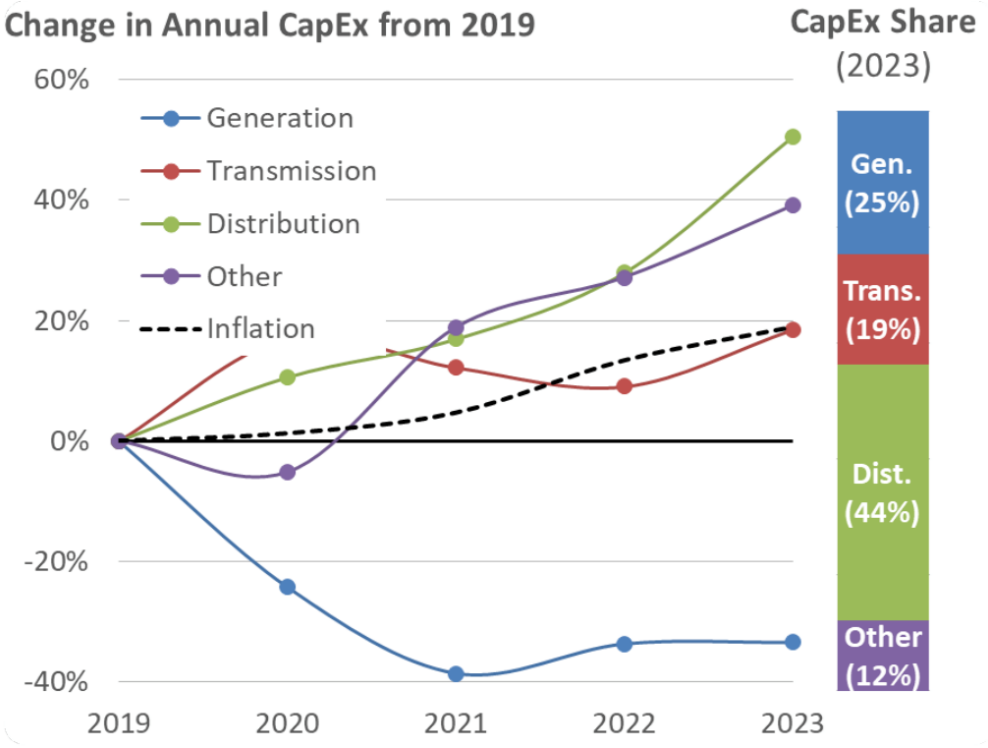
Tax credits are important for reducing the cost of energy

https://www.lazard.com/media/eijnqja3/lazards-lcoeplus-june-2025.pdf

Markets are being questioned

- Retail electricity prices increasing faster than inflation
- Rising transmission and distribution costs
- Capacity market prices increases
- Long timelines to bring on new resources
- Concern about costs due to “other states’ policies”



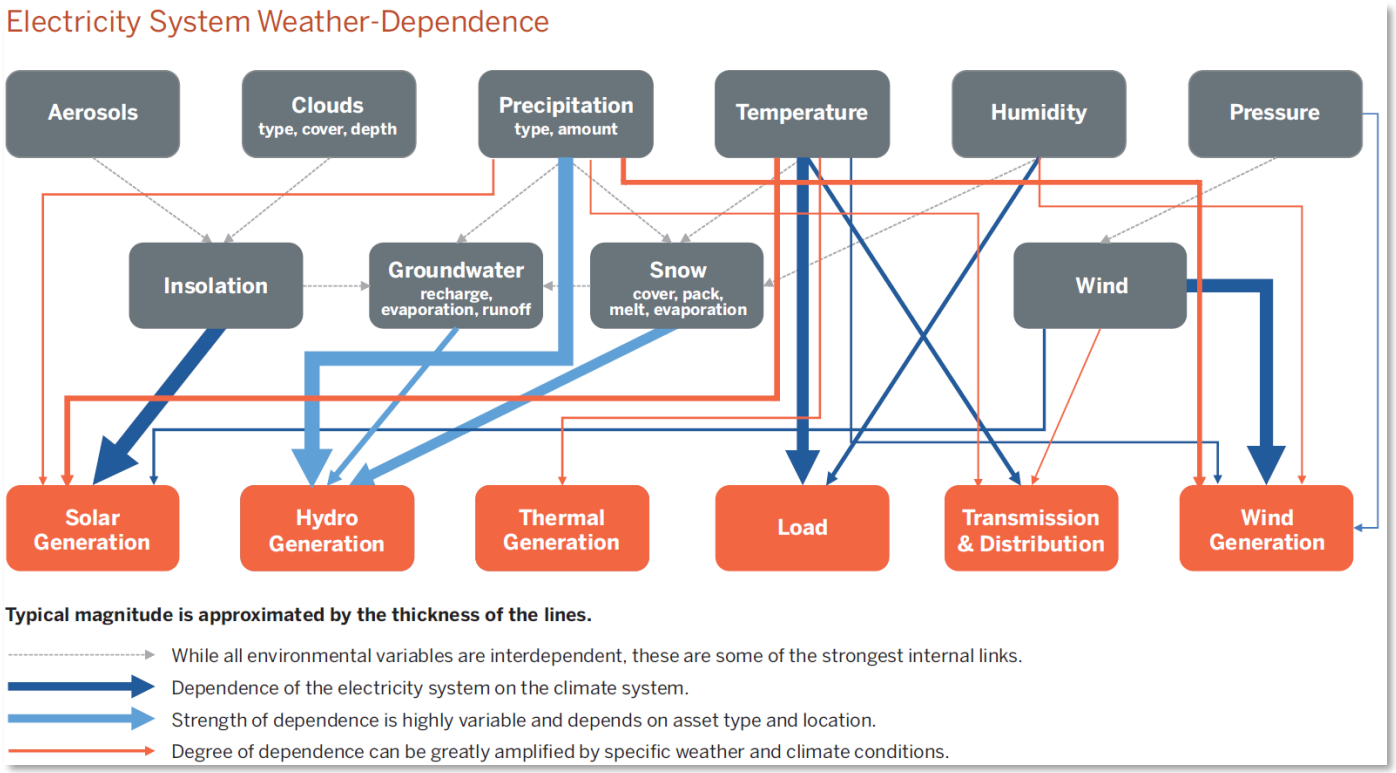


https://www.eia.gov/todayinenergy/detail.php?id=65284; https://eta-publications.lbl.gov/sites/default/files/2025-01/retail_price_and_cost_trends_2024_update_final_v3.pdf

The imperative for linking the energy and meteorology communities

Our electricity system is becoming increasingly weather-dependent

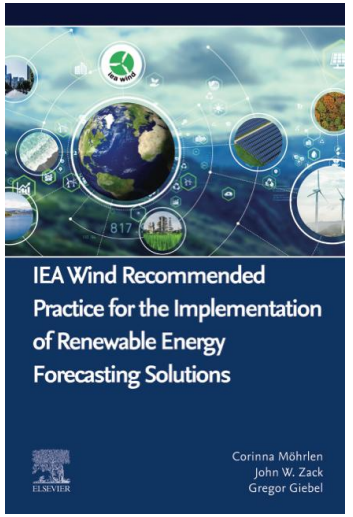
- Record-breaking heat events
- Dunkelflaute events and “boring weather” in which wind/solar generation is much less than demand
- Increased electrification means “winter is the new summer”. And winter events tend to be longer duration and harder to mitigate.
  - Gas/electric coordination and market mismatch
  - Heat pumps going into resistance heating mode
- Increased risk of wildfires and interaction with T&D infrastructure
- Forecasting for dynamic line ratings



https://www.esig.energy/wp-content/uploads/2023/10/ESIG-Weather-Datasets-full-report-2023b.pdf

Missing a key member of our community

- Dr. John Zack, 72, of East Greenbush, NY, passed away May 24, 2025
- John was the President and Co-founder of MESO Inc., a business that specializes in the development and application of physics-based and statistical geophysical models for a wide range of industries. He was the co-founder of Meteosim, SL, a meteorological service company based in Barcelona, Spain, and was one of the founding partners of AWS Truepower (now UL), a global leader in renewable energy consulting services.
- John was an active member of the ESIG community, received a 2020 ESIG Excellence Award, played a leading role in the IEA Wind activities on forecasting, and helped organize the ICEM.
- **He dedicated his life to the development of meteorological modeling, renewable energy, and the individuals who shared his passion for these topics**



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
- Long-term Load Forecasting TF (joint w/ DER) — Julieta Giraldez
- Integrating Across Siloes of Transmission Planning TF — Ahmed Rashwan
- 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
- Large Loads TF – Market Options & Operations PT — Beth Garza/Erik Ela
- Large Loads TF — Sam Morris
- Large Loads TF – Data Collection PT — Drew Siebenaler

DER WG
Obadiah Bartholomy

- EV Load Forecasting Guide TF — Matt Schuerger
- Integrated Planning TF (joint with SPWG&RWG) — Aaron Burdick

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

Users Groups Structure

Operations & Maintenance

Ninochska Bosworth

Probabilistic Forecasts in Planning & Operations

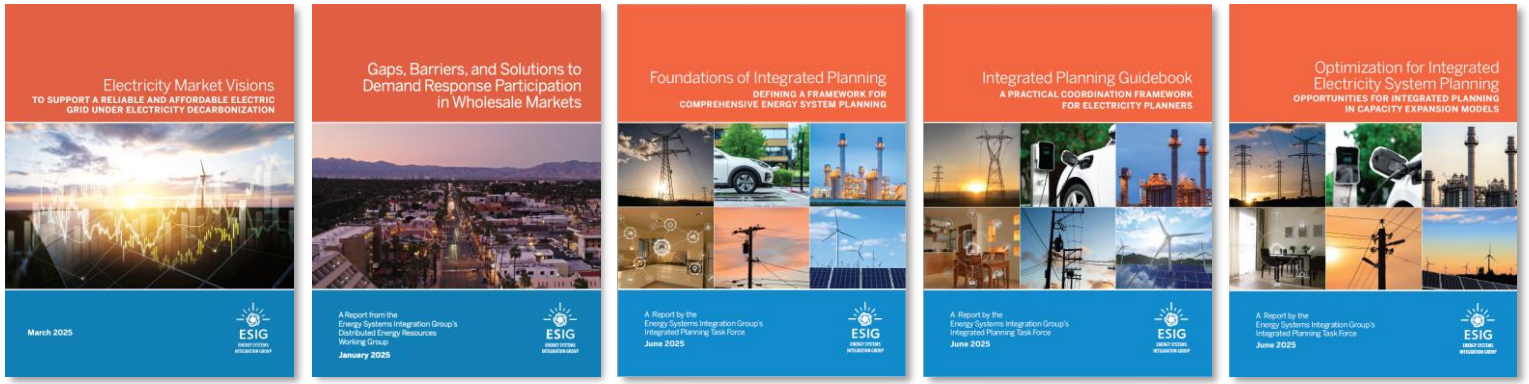
Nitika Mago

Grid Enhancing Technologies

Ken Donohoo

Relevant recent publications

- 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



To be published in the next few months:

- Long-term Load Forecasting
- Stress Testing Methods for Evaluating Resilience to Extreme Events
- Grid-Enhancing Technologies
- Integrating Siloes of Transmission Planning
- Wide Area Resource Adequacy Assessments: Probabilistic RA Planning for Interconnected Grids
- EV Load Forecasting Guide
- Net Zero Electricity Planning

This week's agenda

Monday

- Probabilistic Forecasting User Group Meeting

Tuesday

- Tutorial on System Operations in the US and Europe
- Introduction / Opening remarks
- Opening Plenary: Recent Advancements in Wind, Solar and Load Forecasting
- 3:45-5:30p Machine Learning and Artificial Intelligence Applications in Forecasting
- 3:45-5:30p Evolving Capacity Markets and their Value in Achieving Resource Adequacy
- Networking Reception

Wednesday

- 8-9:45a New Forecasting Methods and Integration of Forecasts into Operations and Markets
- 8-9:45a Long Duration Storage: Operations, Value and Accreditation

This week's agenda (part 2)

- 10:15-noon Advancements in Forecasting: From DERs and Data Centers to New Methods for Wind and Solar Forecasting
- 10:15-noon Integrating Electric Storage Resources into Electricity Markets: Enhancements to Improve Efficiency and Reliability
- 1:15-3p Utility, ISO & Meteorology Probabilistic Forecasting Developments
- 1:15-3p The Increasing Need and Value for Long- and Short-Term Price Forecasts
- 3:30-5:15p Emerging Forecasting Applications
- 3:30-5:15p Dynamic Operating Reserve Methods: Forecasting Reserve for Improved Operations

<u>Thursday</u>

- 8-9:45a Weather, Extreme Events and Resilience
- 8-9:45a Technology Neutrality and Market Participation Models
- Closing Plenary: Future Needs for Forecasting in Power System Applications

Finish at noon

Large Loads Workshop

Thursday afternoon

- Lunch
- 1:15-2:45p Flexibility from large loads – What are the options? What are the benefits?
- 3:15-5p How Different Levels of Flexibility Impact Resource Adequacy
- Networking event @ Pins Mechanical

Friday morning

- 8:30-10:15a Challenges and barriers for efficient integration of flexible large loads in energy and ancillary service markets
- 10:45-12:15p Opportunities for development. A look forward.

Finish at 12:15pm

Welcome to our International Participants!

- Australia
- Belgium
- Canada
- Denmark
- Germany
- Hong Kong
- Japan
- Vietnam

+ Welcome to those from the Great Nation of Texas!