

A wide-angle photograph of the Nashville skyline at dusk. The city is illuminated with warm lights, and the sky is a mix of purple and blue. The text "2025 Forecasting & Markets Workshop" is in white, and "NASHVILLE, TN" is in large orange letters.

2025 Forecasting & Markets Workshop NASHVILLE, TN

Opening Remarks

Mark Ahlstrom
ESIG Board President

Debbie Lew
ESIG Executive Director

ESIG Forecasting and Markets Workshop



Debbie Lew
Executive Director, ESIG

June 24, 2025
Nashville, TN

ESIG Disclaimer



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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.

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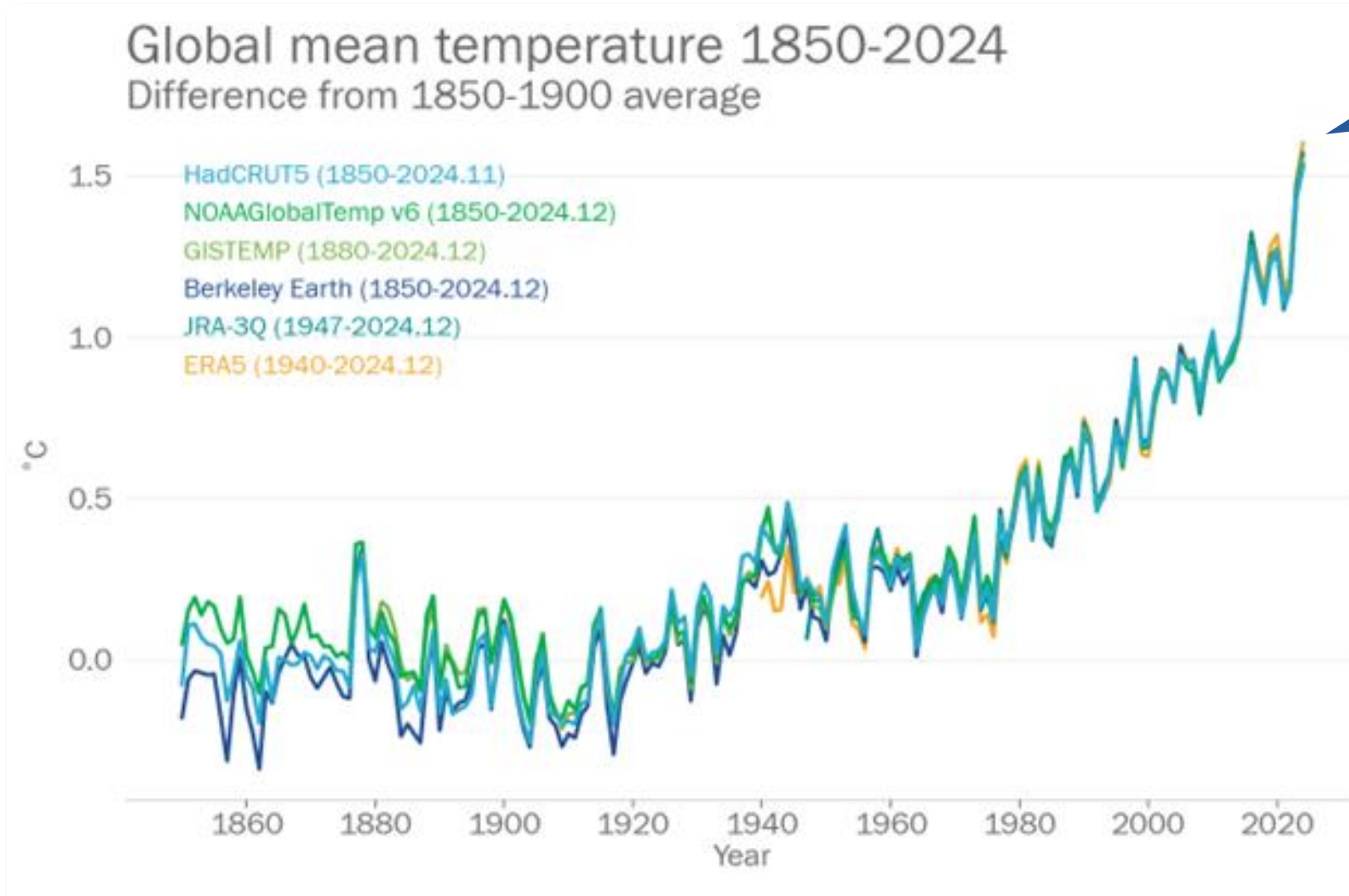


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Why are we here?



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

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

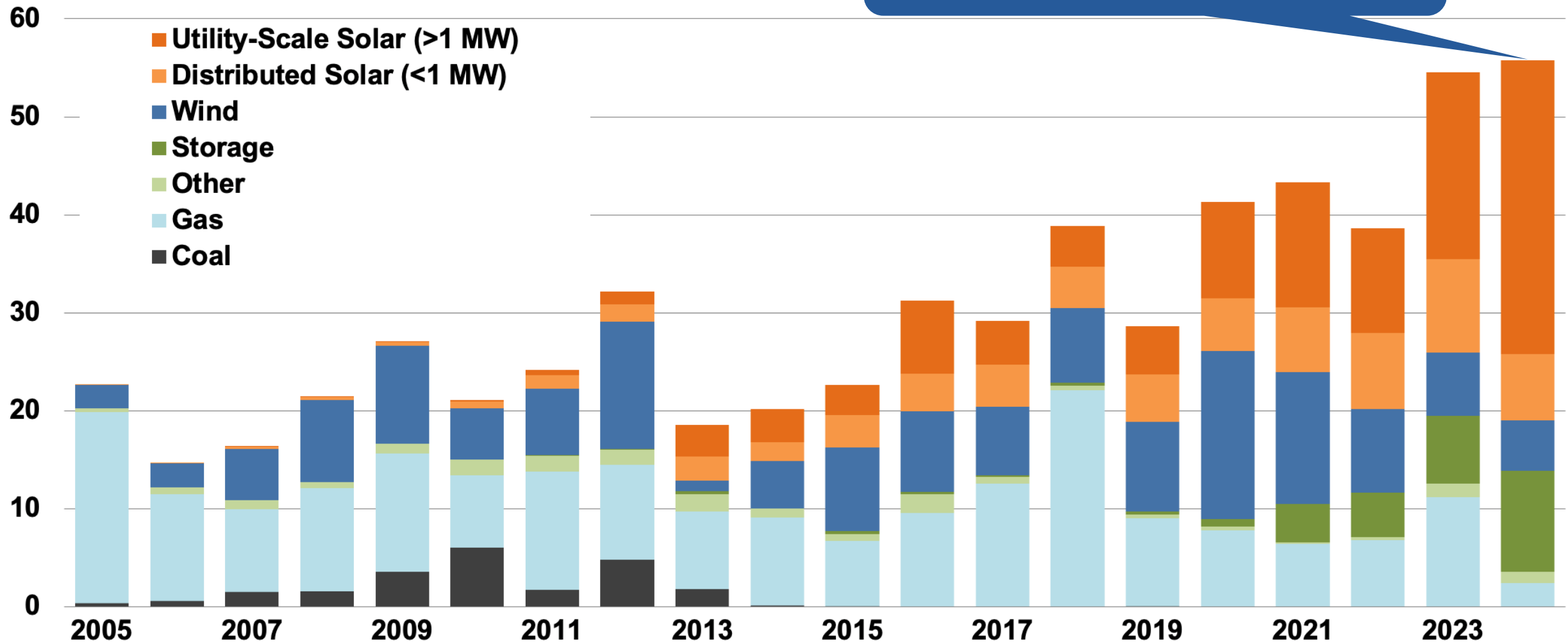
<https://wmo.int/news/media-centre/wmo-confirms-2024-warmest-year-record-about-155degc-above-pre-industrial-level>

Progress in cleaning up the electricity sector



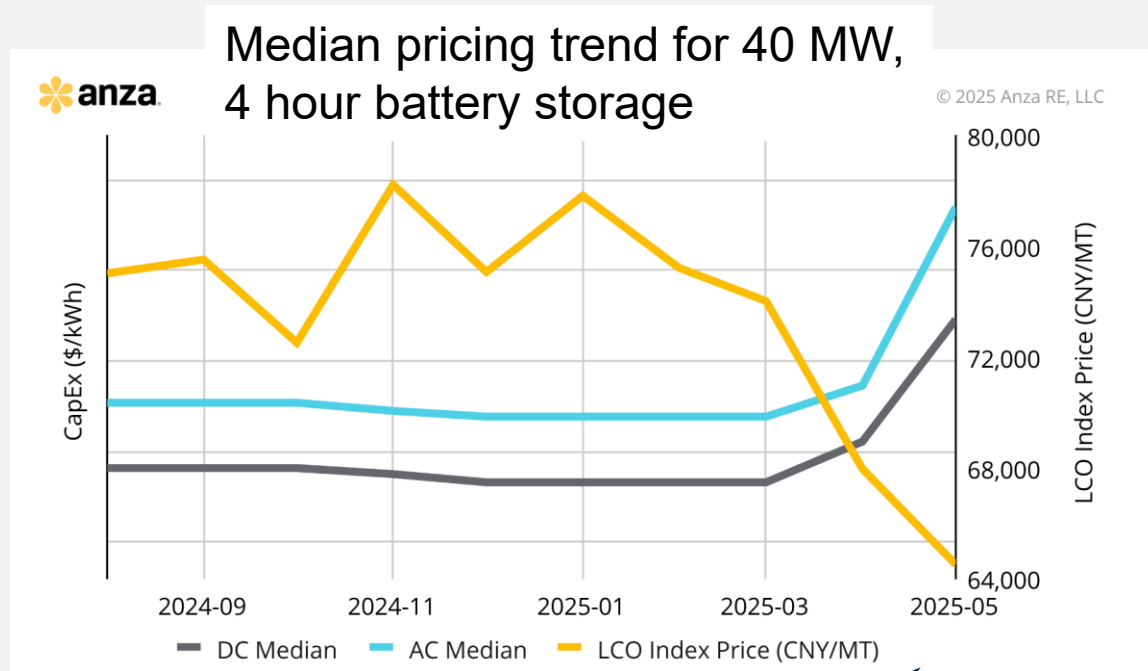
The US added more solar (30 GW) in 2024 than any other technology in 2 decades

Annual Capacity Additions (GW_{AC})



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



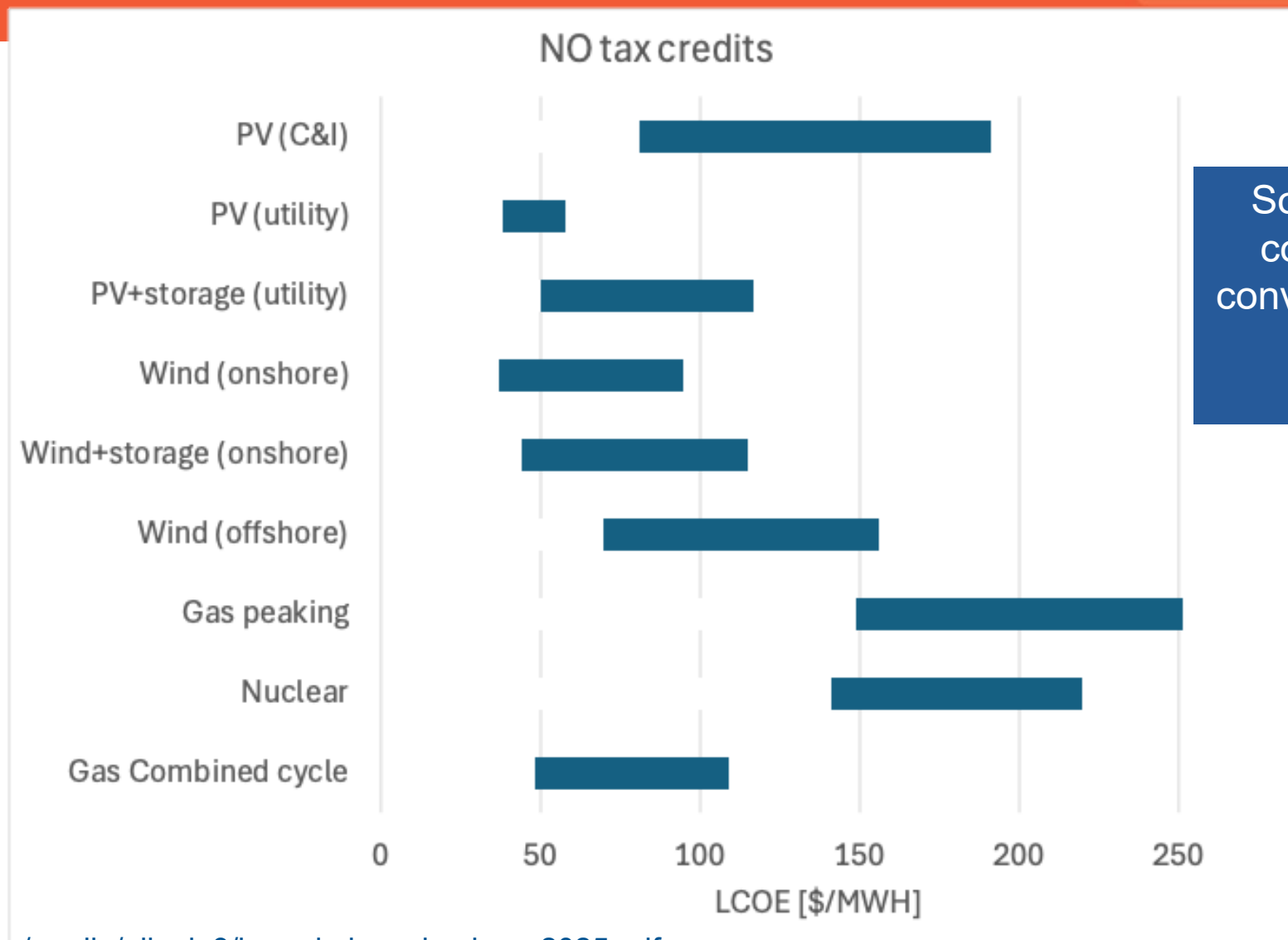
Battery prices rose 56-69% since January, while lithium prices dropped 17%.

The New York Times

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

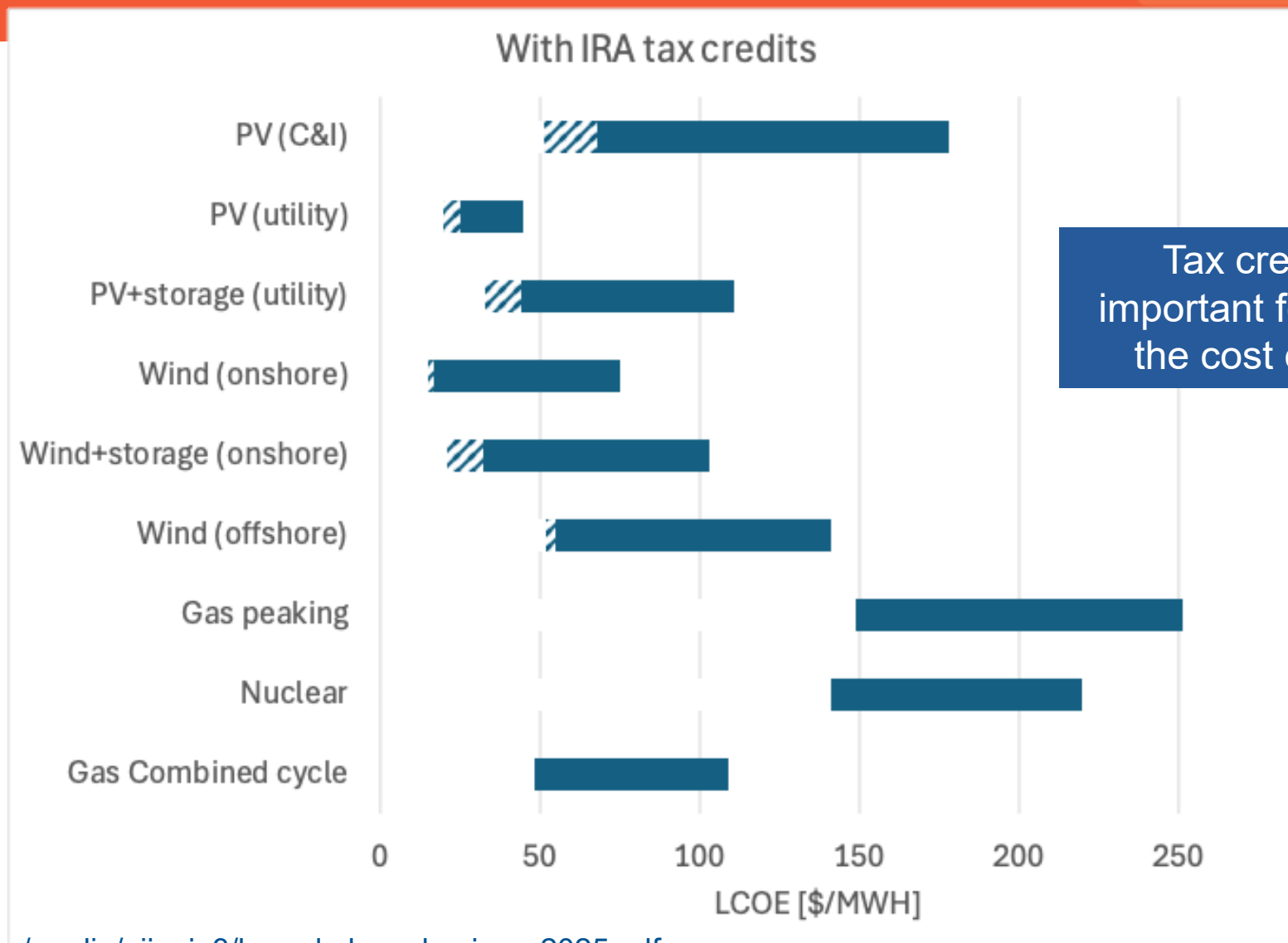
- House passed budget bill on May 22:
 - Ends clean energy production credits (45Y) and clean electricity investment credits (48E) in 2028
 - Ends rooftop solar (25D) tax credits in 2025

Lazard's newest levelized cost of energy analysis



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

Lazard's newest levelized cost of energy analysis



Tax credits are important for reducing the cost of energy

Markets are being questioned

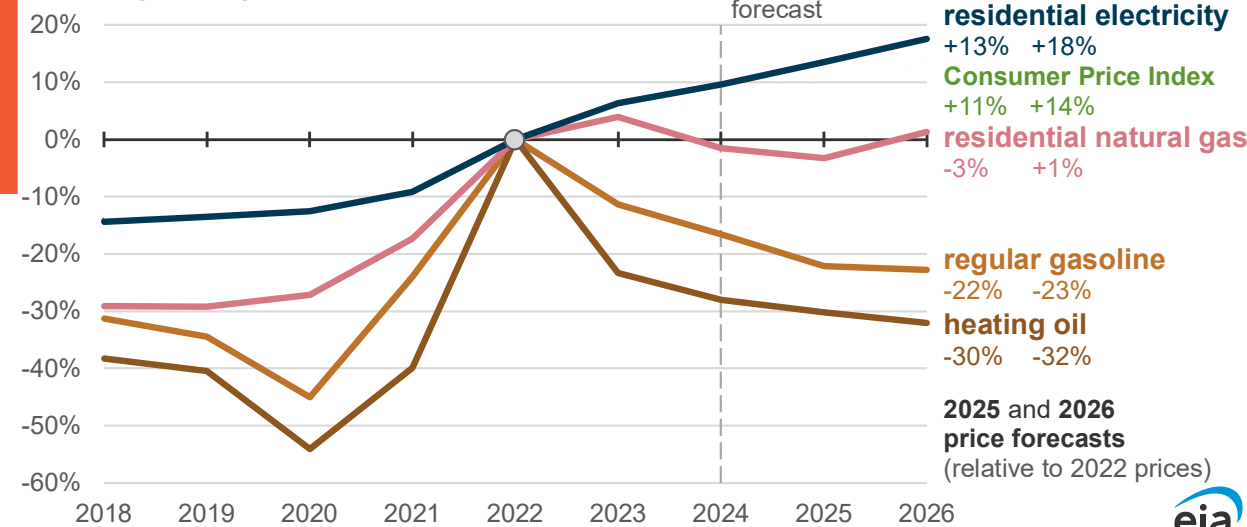
- Retail electricity prices increasing faster than inflation
- Rising transmission and distribution costs
- Capacity market prices increases
- Long timelines to bring on new resources
- Concern about costs due to “other states’ policies”



<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

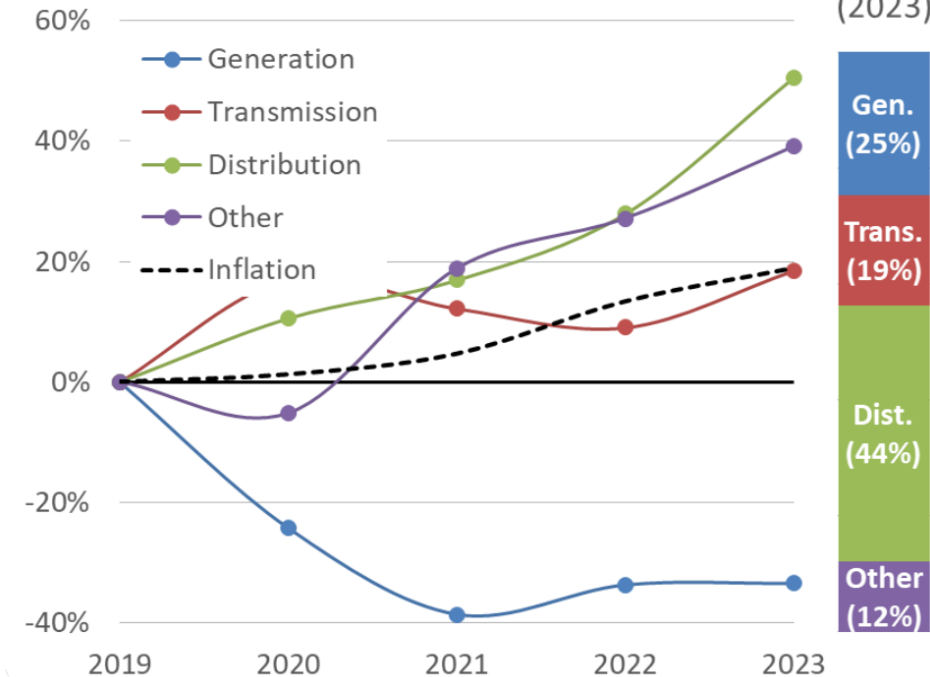
Selected retail energy prices and Consumer Price Index (2018–2026)

percentage change relative to 2022



Change in Annual CapEx from 2019

CapEx Share (2023)

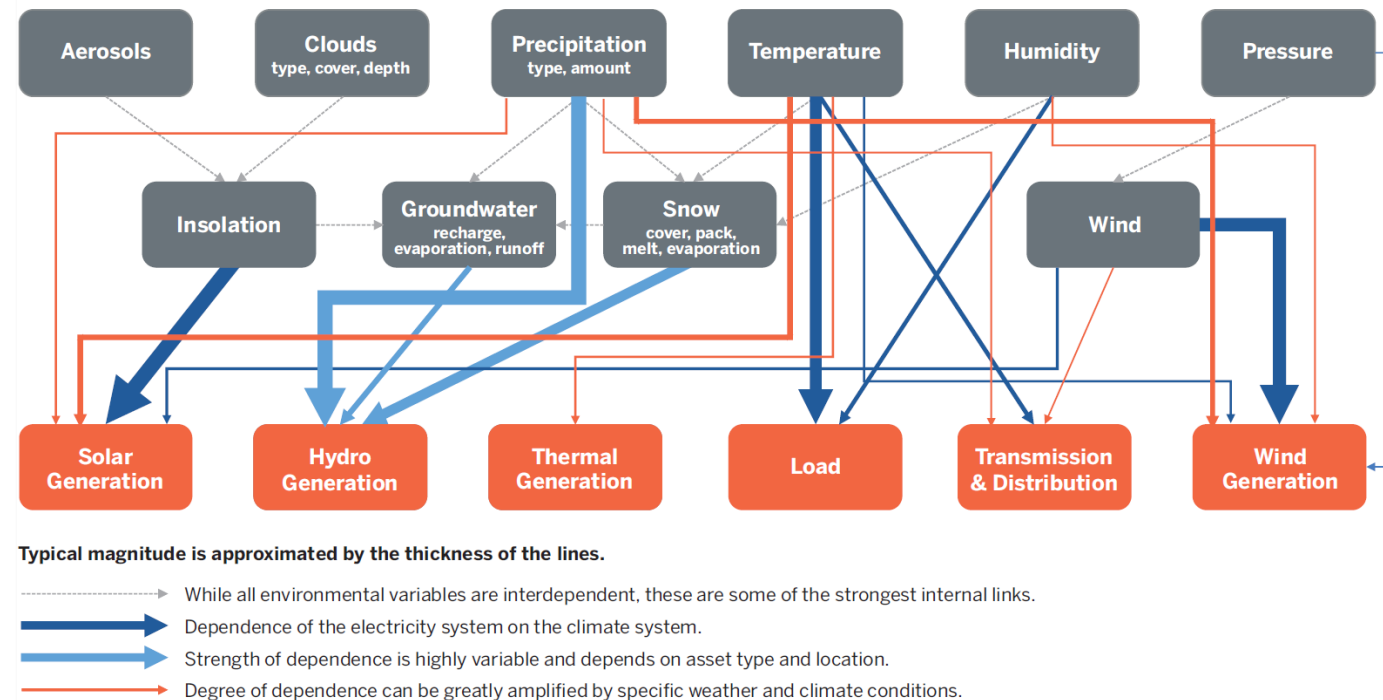


The imperative for linking the energy and meteorology communities

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

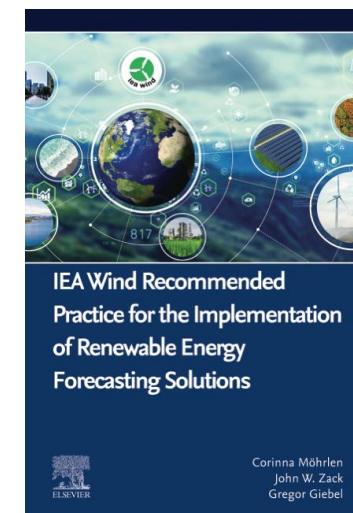
Electricity System Weather-Dependence



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

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

Large Loads TF

Sam Morris

Large Loads TF – Data
Collection PT

Drew Siebenaler

Users Groups Structure



Operations &
Maintenance

Ninotchka
Bosworth

Probabilistic
Forecasts in
Planning &
Operations

Nitika Mago

Grid Enhancing
Technologies

Ken Donohoo

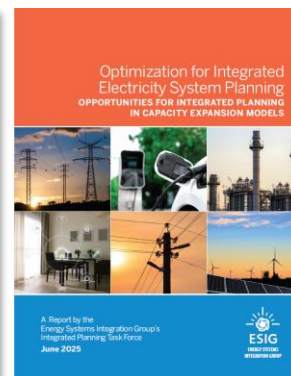
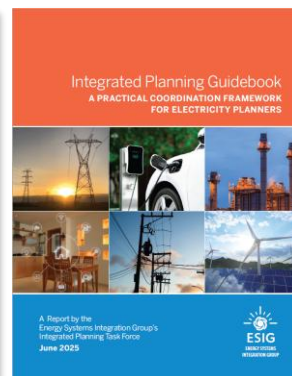
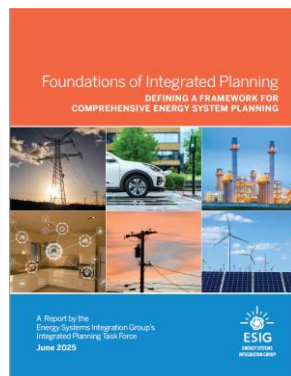
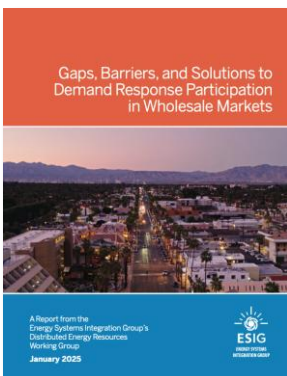
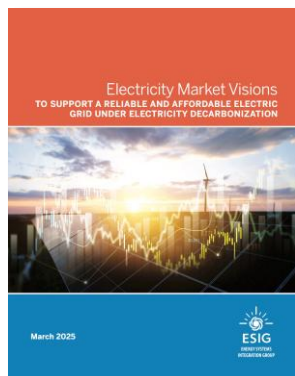
Relevant recent publications



- [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

Thursday

- 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!