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ONE HUNDRED NINETEENTH CONGRESS

Congress of the United States
House of Representatives
COMMITTEE ON ENERGY AND COMMERCE
2125 RAYBURN HOUSE OFFICE BUILDING
WASHINGTON, DC 20515-6115
Majority (202) 225-3641
Minority (202) 225-2927

MEMORANDUM March 20, 2025

TO: Members of the Subcommittee on Energy
FROM: Committee Majority Staff
RE: Hearing titled "Keeping the Lights On: Examining the State of Regional Grid Reliability"

I. INTRODUCTION

The Subcommittee on Energy has scheduled a hearing on Tuesday, March 25, 2025, at 10:15 a.m. (ET) in 2123 Rayburn House Office Building. The title of the hearing is "Keeping the Lights On: Examining the State of Regional Grid Reliability." This hearing will examine how the nation's regional grid operators plan to address grid reliability challenges, as demand for power increases across the nation.

II. WITNESSES

- **Gordon van Welie,** President & Chief Executive Officer, ISO New England (ISO-NE);
- **Richard J. Dewey,** President & Chief Executive Officer, New York Independent System Operator (NYISO);
- **Manu Asthana,** President & Chief Executive Officer, PJM Interconnection, LLC;
- **Jennifer Curran,** Senior Vice President for Planning and Operations, Midcontinent ISO (MISO);
- **Lanny Nickell,** Chief Operating Officer, Southwest Power Pool;
- **Elliot Mainzer,** President & Chief Executive Officer, California Independent System Operator (CAISO);
- **Pablo Vegas,** President & Chief Executive Officer, Electric Reliability Council of Texas, Inc., (ERCOT).

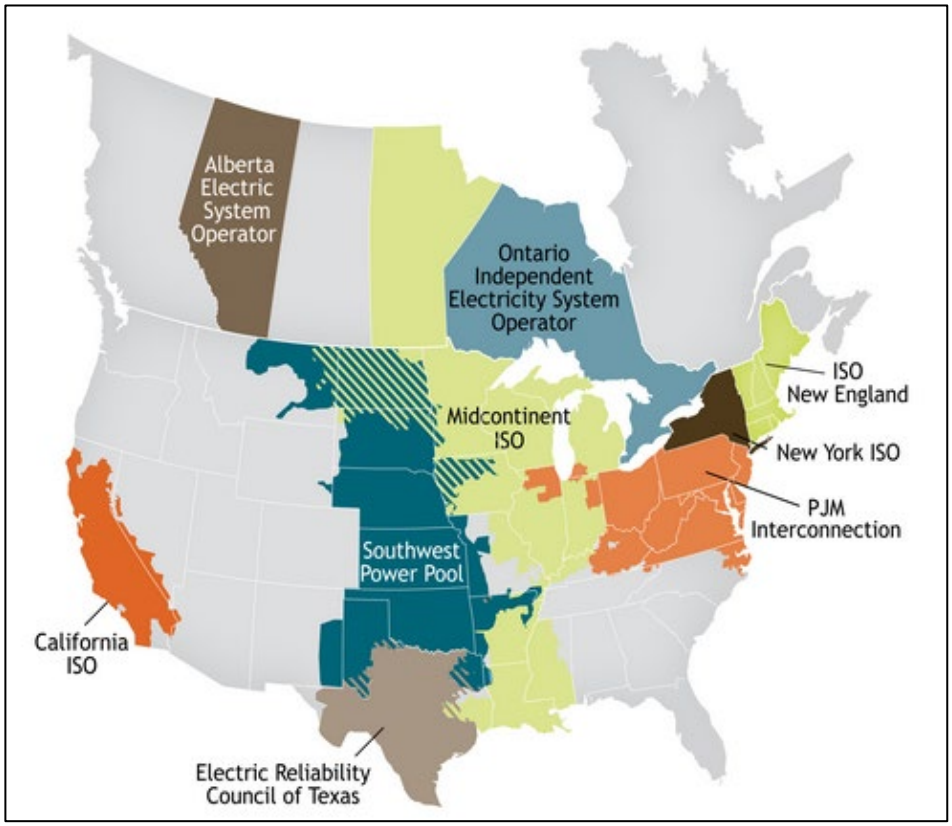
III. BACKGROUND

The nation's electric power system is comprised of vast networks of high voltage transmission lines, generating resources, local distribution lines, and other critical infrastructure to ensure the physical delivery of adequate and reliable supplies of electricity. The success of the grid relies on real-time communication and coordination between the grid operators and the many

entities that participate in its wholesale markets, which, depending on market structure, include generators, transmission owners, energy traders, marketers, and demand response providers, among others.[1]

The electricity system in the United States was originally made up of vertically integrated utilities for all aspects of generation, transmission, and distribution. Following the passage of the Energy Policy Act of 1992 and subsequent Federal Energy Regulatory Commission (FERC) Orders, the electricity industry opened transmission access to other wholesale power producers, and many regions of the country created competitive markets for wholesale power, which is generally called restructuring or deregulation. These markets, known as Regional Transmission Operators (RTO) or Independent System Operators (ISO), cover two thirds of the country.

Each RTO and ISO operates with varying degrees of similarity and are charged with overseeing the nation's wholesale electricity markets, managing the day-to-day operations of its respective transmission systems and offering a market to purchase products including energy, capacity, ancillary services,[2] and financial transmission rights. In addition to operating the real-time and day-ahead electricity markets, each of these RTOs and ISOs are responsible for longer-term resource adequacy forecasting and transmission planning to ensure continued reliability. Combined, these organized markets serve two-thirds of the nation's electricity load. There are currently seven ISO/RTOs in the United States. FERC exercises exclusive jurisdiction over six of these: PJM Interconnection (PJM), New York ISO (NYISO), Midcontinent ISO (MISO), ISO-New



[1] *See generally* FED. ENERGY REG. COMM'N, *Energy Primer: A Handbook for Energy Market Basics*, (December 2023) at 53, https://www ferc.gov/sites/default/files/2024-01/24_Energy-Markets-Primer_0117_DIGITAL_0.pdf.
[2] Ancillary services ensure the reliability of and support for the transmission of electricity.

England, California ISO (CAISO), and the Southwest Power Pool (SPP). The Electric Reliability Council of Texas (ERCOT) manages wholesale transactions solely within the state of Texas.

The regions that are not in RTOs/ISOs, the Southeast, Southwest, and Northwest, have remained in traditional wholesale electricity markets where utilities are responsible for grid operations and management as well as providing electricity to consumers. These traditionally regulated utilities are primarily regulated by their respective state public utility commissions and may voluntarily participate in non-RTO/ISO market structures.[3]

Energy Markets, Interconnection Queue, and Reserve Margins

For short-term grid reliability and resource scheduling in the markets, electricity is sold and purchased at a clearing price, generally on a day-ahead or real-time basis. This price is known as the locational marginal price (LMP) and reflects the market price for electricity. It is composed of three elements: an energy charge, a congestion charge, and a charge for transmission system energy losses. The RTOs/ISOs calculate a LMP at each location on its grid to reflect the marginal cost of serving demand (or "load") at the specific location. All resources selling energy receive the LMP and all buyers pay that same market clearing price. Under this pricing mechanism, power sellers that offer prices lower than the clearing price, still receive the highest clearing prices.[4]

In addition to energy markets, several of the RTOs/ISOs also operate capacity markets to provide longer term revenues for power producers to ensure generation resources will be available, when needed, in the future. There are different designs among regions, but the sale of "capacity" typically provides the buyer with the right to purchase the energy at a capped price to use at some point in the future. When the capacity obligation comes due in the future, the generator is required to make its output available.

When seeking to add new generation resources to their transmission systems, each RTO and ISO requires developers to undergo a series of impact studies that identify the operational requirements for new resources to be added, as part of the interconnection process. In recent years, RTOs and ISOs have seen growing backlogs of interconnection requests—known as the interconnection queue—mostly from wind, solar, or battery storage resources. The number of requests in the queue is not necessarily indicative of the generation capacity that will be added to the system. For example, in PJM, the historical rate for completing the interconnections of renewable resources has been 5 percent.[5] PJM recently noted that the amount of generation

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[3]Some utilities in traditionally regulated states voluntarily participate in wholesale electricity markets, such as the Southwest Power Pool (SPP) Markets +, CAISO Extended Day-Ahead Market, or the Southeastern Energy Exchange Market in nine southeastern states. These voluntary markets are intended to leverage unique regional resources and economies of scale to lower costs, mitigate transmission congestion, and increase price transparency through enhanced market operations.

[4] *See* FED. ENERGY REG. COMM'N, *An Introductory Guide to Electricity Markets Regulated by the Federal Energy Regulatory Commission* (last updated Jan. 23, 2025), https://www ferc.gov/introductory-guide-electricity-markets-regulated-federal-energy-regulatory-commission.

[5] PJM, *Energy Transition in PJM: Resource Retirements, Replacements & Risks* (February 24, 2023), https://www.pjm.com/-/media/DotCom/library/reports-notices/special-reports/2023/energy-transition-in-pjm-resource-retirements-replacements-and-risks.ashx.

awaiting interconnection is not sufficient to replace the retiring generation capacity, most of which is dispatchable baseload thermal generation.[6]

Another essential function of the RTOs/ISOs is to maintain adequate reserve margins, ensuring obligations to deliver electricity are met when system disruptions occur, or when peak demand exceeds the obligated load. The chart below illustrates when the projected shortfalls in reserve margins may occur over the next decade.

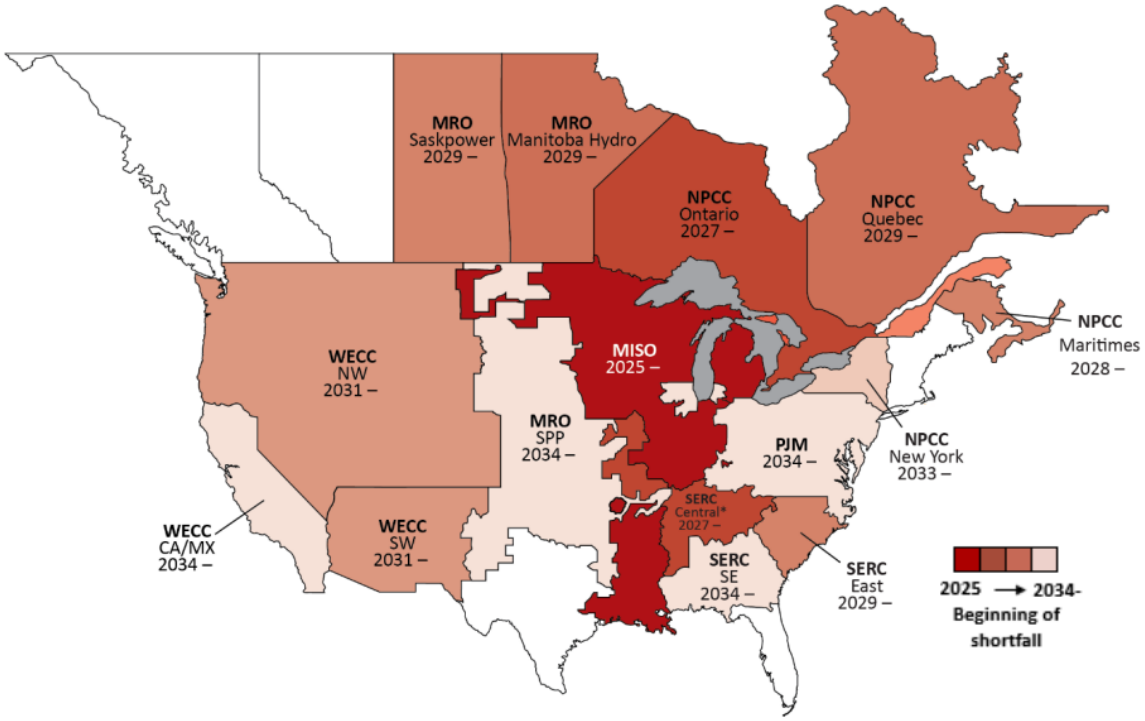

Figure 2: Projected Reserve Margin Shortfall Areas

Source: 2024 NERC Long-Term Reliability Assessment

Ongoing Challenges to Reliability and Resource Adequacy

The retirement of dispatchable generating sources (e.g. coal, natural gas, and nuclear) and the increase in intermittent generation from wind and solar resources has created reliability challenges. The North American Electric Reliability Corporation's (NERC) 2024 Long-Term Reliability Assessment found that a majority of the nation's bulk power system faces mounting resource adequacy challenges. The report finds that less overall capacity, particularly dispatchable capacity, is being added to the system than what was projected and needed to meet future demands. The head of NERC stated he believes the United States is headed for a reliability crisis.[7]

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[6] *Scaling for Growth: Meeting the Demand for Reliable, Affordable Electricity: Hearing Before the Subcomm. On Energy of the H. Comm. on Energy and Commerce 119th Cong.,* (March 5, 2025) (statement of Asim Z. Haque, Sr. Vice President, PJM Interconnection).

[7] *The Reliability and Resiliency of Electric Service in the United States in Light of Recent Reliability Assessments and Alerts: Hearing Before the Senate Comm. on Energy and Natural Resources,* 118th Cong. (2023) (statement of James B. Robb, President and CEO of the North American Electric Reliability Corporation).

Increasingly, ISOs and RTOs have warned of the potential for electricity disruptions and asked their customers to conserve power.[8] Currently, some regions do not have enough reliable, dispatchable generation to produce the electricity required to maintain reliable operation of the bulk power system. PJM, the nation's largest wholesale market, recently warned that the RTO could see a capacity shortage as early as 2026 or 2027 and identified public policies, permitting constraints, and supply chain challenges as key trends that are tightening supply-demand balance within the system.[9] Over the next 10 years, 115 GW of generation has been announced to be retired across the United States.[10] In 2025 alone, electric generators plan to retire 12.3 GW of coal capacity, a 65 percent increase in retirements compared to 2024.[11] Absent sufficient replacement of generating resources, reliability risks will continue across the nation—even during normal peak demand—especially in the RTO/ISOs. The following image from NERC's Long-Term Reliability Assessment, issued in December 2024, illustrates the risk status of certain regions between 2025-2029.

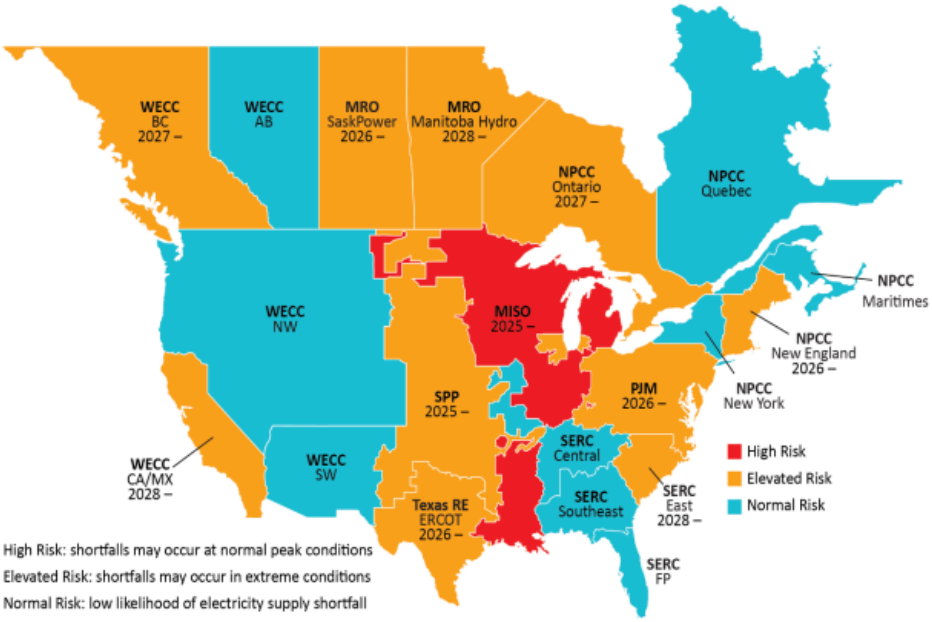

Figure 1: Risk Area Summary 2025–2029

Source: 2024 NERC Long-Term Reliability Assessment

[8] CAISO, SPP, MISO, PJM, and ERCOT have all issued alerts to conserve power in recent years. *See, e.g.,* ERCOT, Energy Emergency Alert 2 (Sept. 6, 2023), https://www.ercot.com/energyemergtwo.

[9] Mark Takahashi, PJM Letter to Stakeholders (Dec. 9, 2024), https://www.pjm.com/-/media/DotCom/about-pjm/who-we-are/public-disclosures/2024/20241209-board-letter-outlining-action-on-capacity-market-adjustments-rri-and-sis.pdf.

[10] N. AM. ELEC. RELIABILITY CORP., *2024 Long-Term Reliability Assessment* (Dec. 2024), https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_Long%20Term%20Reliability%20Assessment_2024.pdf.

[11] ENERGY INFO. ADMIN., *Planned retirements of U.S. coal-fired electric-generating capacity to increase in 2025* (Feb. 2025), https://www.eia.gov/todayinenergy/detail.php?id=64604&utm_medium=email.

III. ISSUES

- Reliability challenges in RTO/ISO service areas.
- How the RTOs and ISOs are adapting to the changing generation mix.
- The impact of federal and state public policy decisions on reliability and affordability of the electric grid.
- How to meet the growing demand for power by AI, manufacturing, and electrification.
- How to address reliability risks from the premature retirement of dispatchable electricity generation.

IV. STAFF CONTACTS

If you have any questions regarding this hearing, please contact Peter Spencer, Andrew Furman, or Mary Martin of the Committee staff at (202) 225-3641.