

The NERC logo consists of the letters "NERC" in a bold, black, sans-serif font. A horizontal blue bar is positioned directly beneath the letters.

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

2025 Summer Reliability Assessment

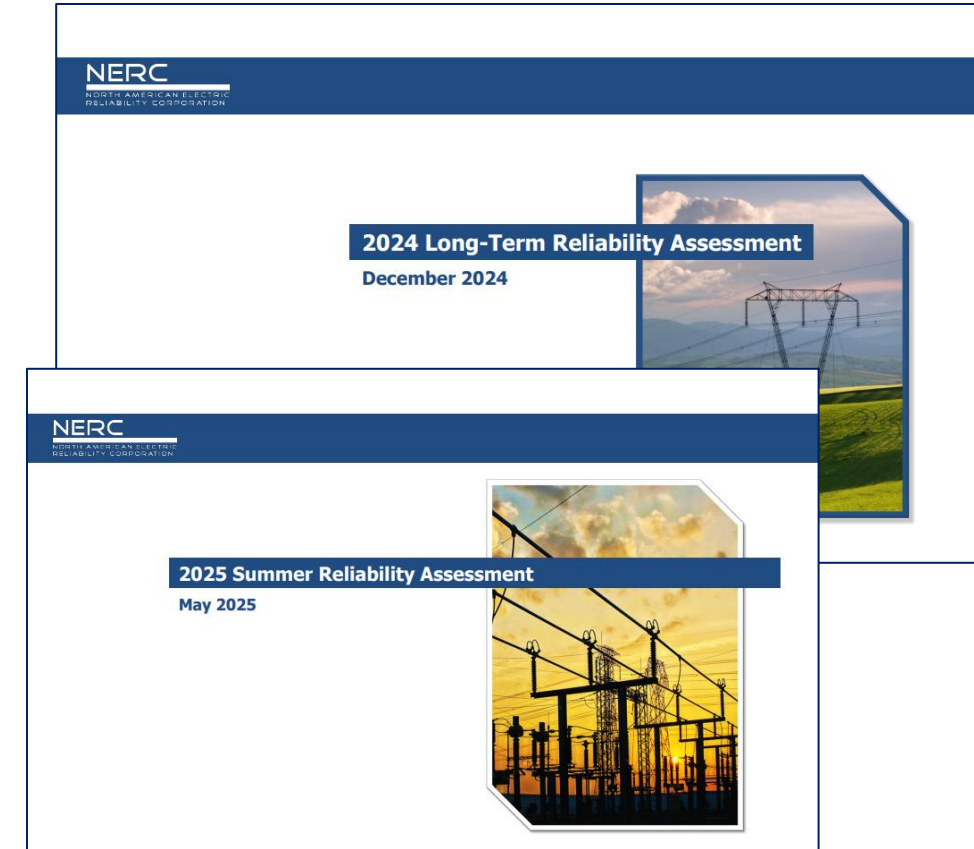
Mark Olson, Manager, Reliability Assessment
National Association of State Utility Consumer Advocates Mid-Year Meeting
June 9, 2025

RELIABILITY | RESILIENCE | SECURITY

NERC is the designated Electric Reliability Organization (ERO) in the U.S. and Canada with responsibilities that include assessing the reliability of the bulk power system

The U.S. Federal Energy Regulatory Commission requires:

The Electric Reliability Organization shall conduct assessments of the adequacy of the Bulk-Power System in North America and report its findings to the Commission, the Secretary of Energy, each Regional Entity, and each Regional Advisory Body annually or more frequently if so ordered by the Commission.



NERC Prepares the following annually: Summer Reliability Assessment, Winter Reliability Assessment, and Long-Term Reliability Assessment

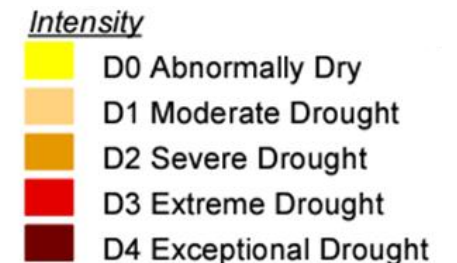
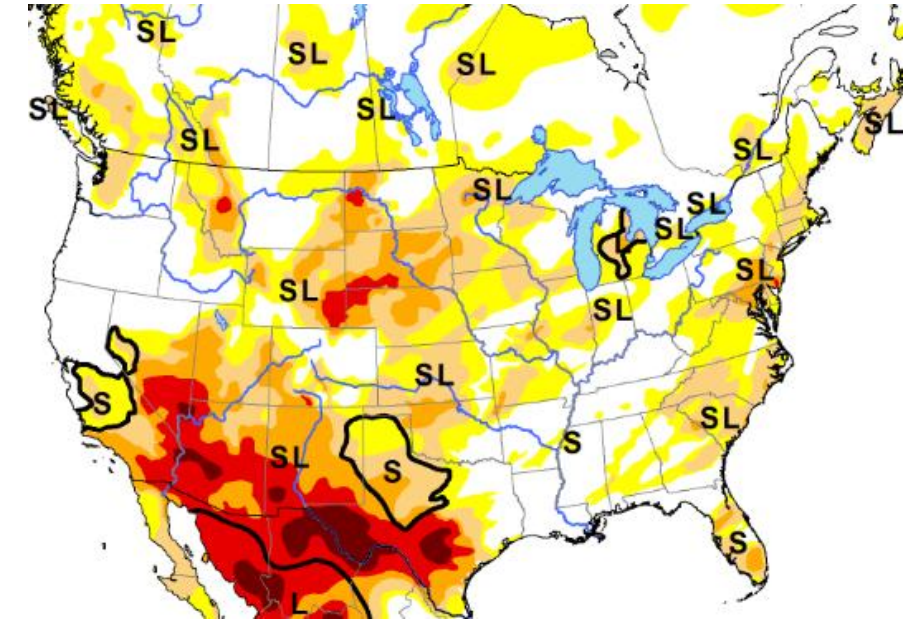
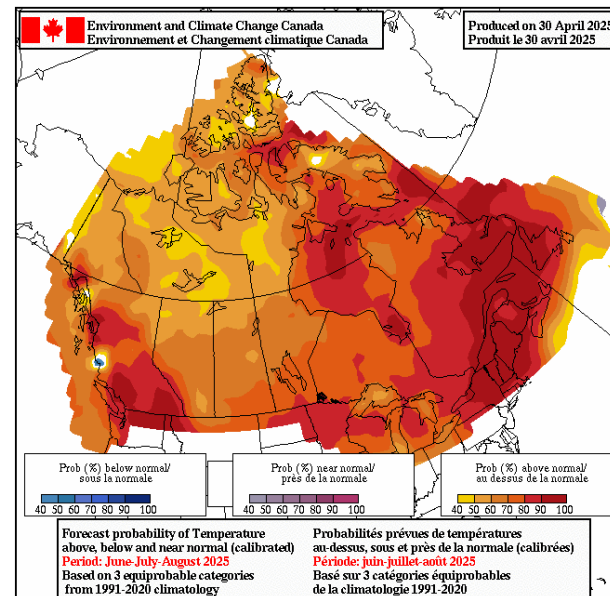
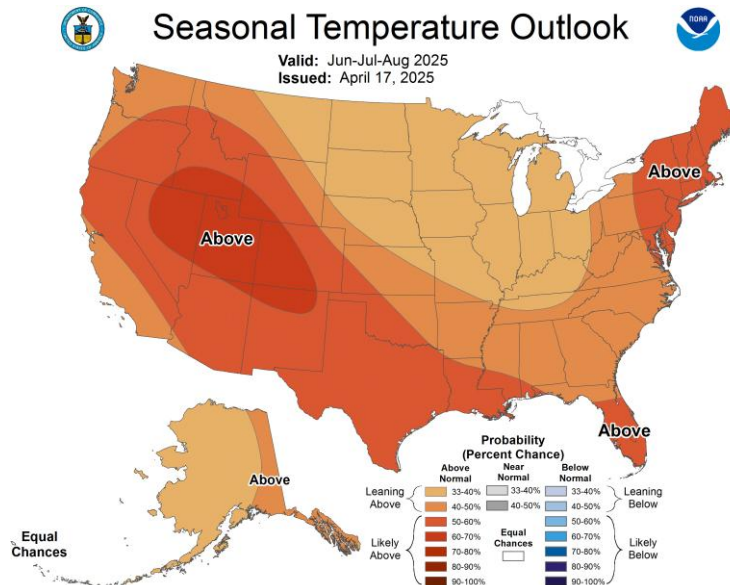
Summer Risk Assessment

- All areas have adequate resources for normal summer demand
- Parts of North America are at risk of electricity supply shortfalls during above-normal demand and other stressed summer conditions

Summer Reliability Trends and Insights

- Accelerating load growth is expected to drive higher peak electricity demand
- Solar photo-voltaic (PV) and battery resource additions are helping to meet summer peak demand and reduce energy shortfall risks in some areas
- Generator retirements are contributing to shrinking reserves and energy risks associated with limited flexible generation
- Unaddressed inverter-based resource (IBR) performance issues are increasing the risk of system instability

- Above average temperatures expected across North America
- Drought conditions across Canada and in the U.S. Southwest can contribute to high temperatures and impact generation and transmission



3-Month Temperature Outlook (U.S. National Weather Service, Environment and Climate Change Canada) and April North American Drought Monitor (NADM)

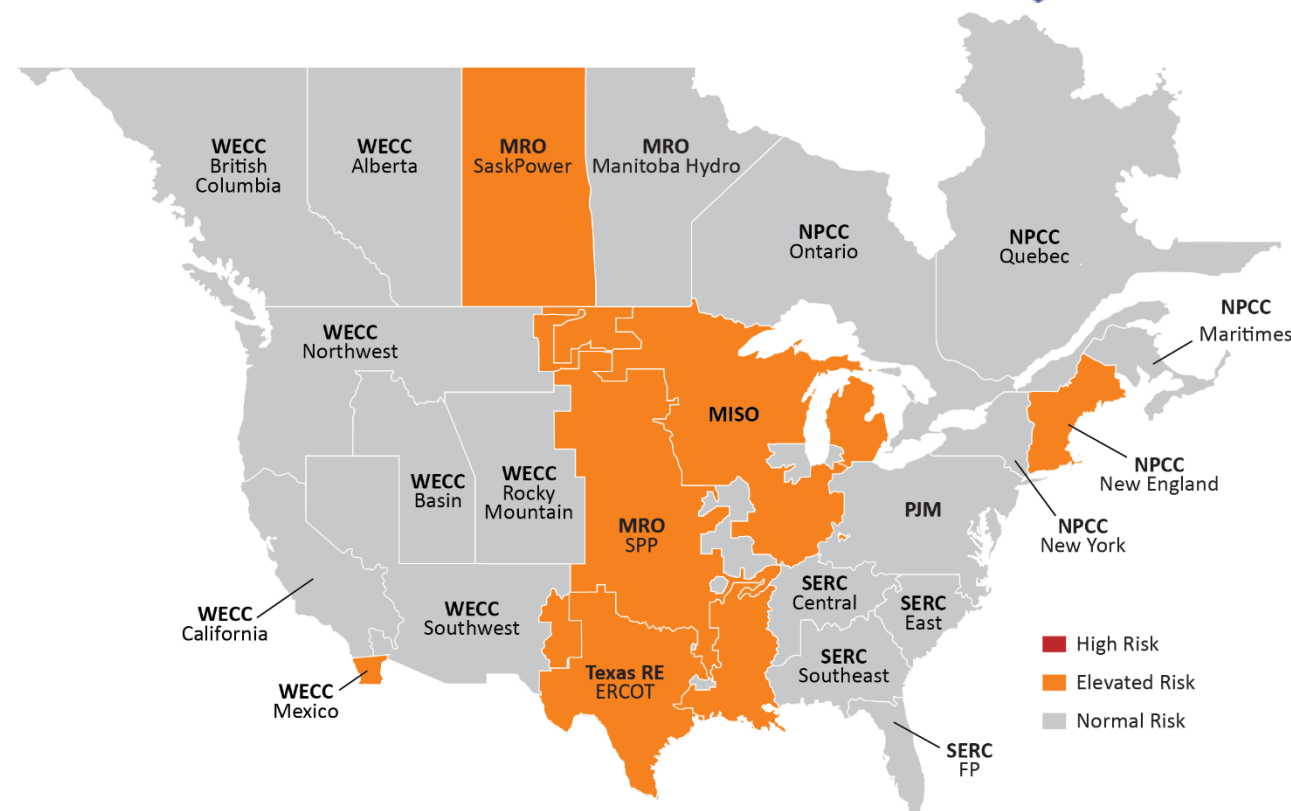
Elevated risk of supply shortages during stressed summer conditions

SPP and MISO: Supply can be insufficient with low wind and unexpected generator outages

NPCC-New England: Lower operating reserves increase reliance on non-firm imports from neighbors

Texas RE-ERCOT: Energy can be insufficient for high evening demand as solar PV output diminishes

SaskPower and Baja-California Mexico: Generator forced outages can trigger supply shortfalls

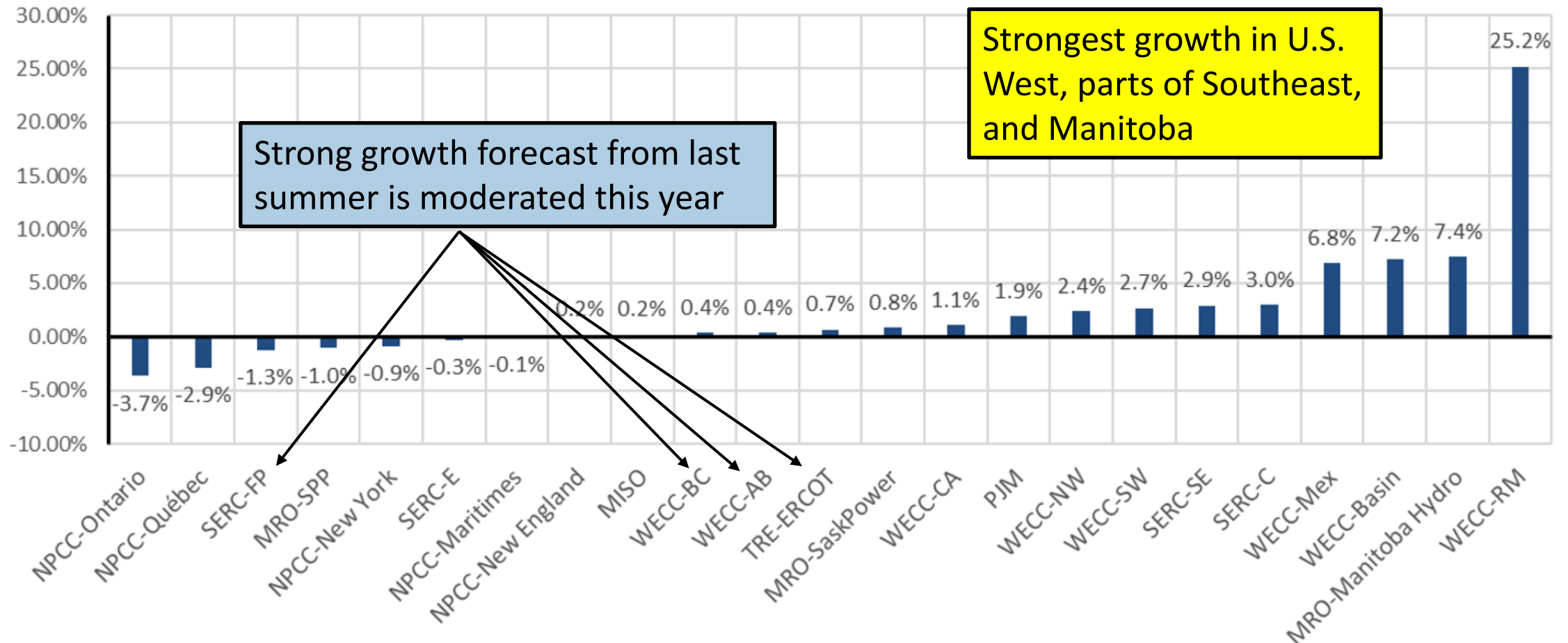


Seasonal Risk Assessment Summary	
Elevated	Insufficient Operating Reserves in Extreme Conditions
Normal	Sufficient Operating Reserves

Extreme summer conditions include 90/10 demand scenarios, historical high generator outage rates, and low variable energy resource scenarios

Summer Peak Demand Forecast | Year-to-Year Change

Summer peak demand has risen by 10 GW (v. 5 GW between 2023 summer and 2024 summer)

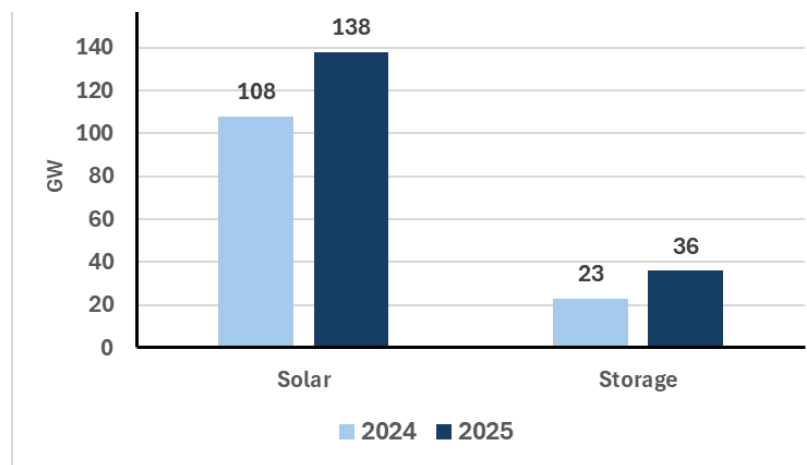


The Resource Mix Is Becoming Increasingly Complex

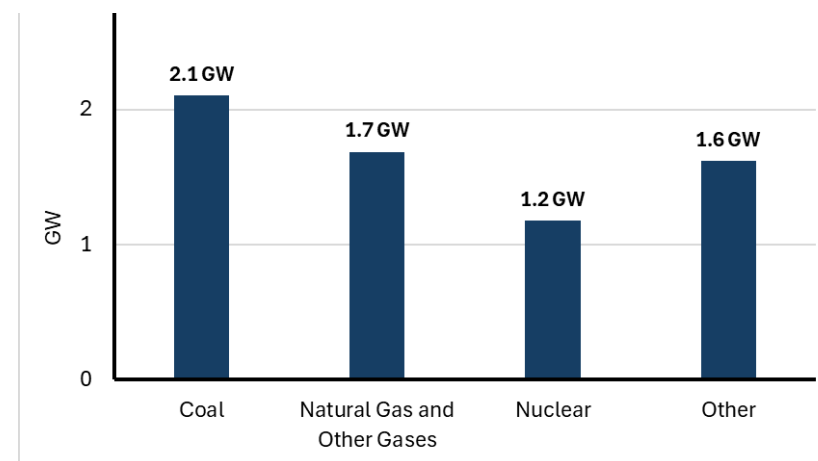
- Resource additions help meet rising summer demand
 - Solar additions: 30 GW installed capacity | 21 GW on-peak
 - Battery additions: 13 GW installed capacity
- Solar PV and batteries are more effective in summer than winter when peak demand occurs during darkness
- Generator retirements are reducing reserve capacity and the availability of flexible generation
- Over 6.5 GW in Bulk Power System (BPS) generator retirements since last summer

U.S. Department of Energy Emergency Orders for plants in PJM and MISO have prevented retirement of additional 2.3 GW

BPS Solar and Storage – Installed Capacity



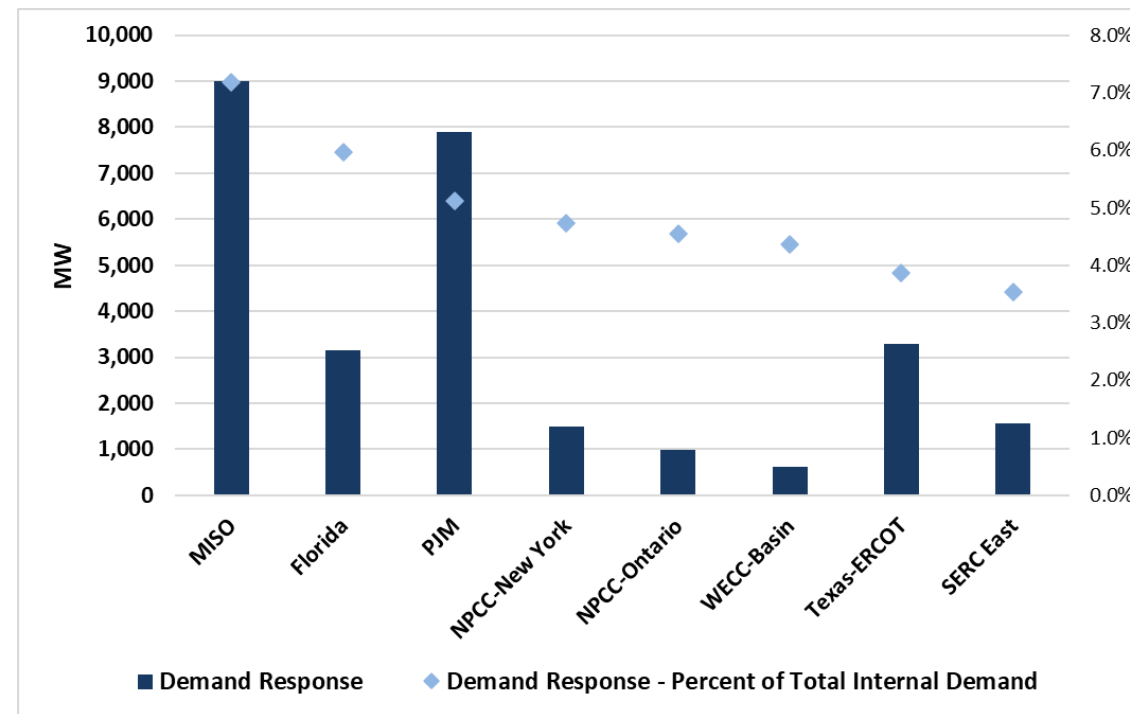
BPS Generator Retirements Since September 2024



- Demand side resources are growing in most summer-peaking areas
- Large commercial customer and retail programs provide load relieve during tight grid conditions

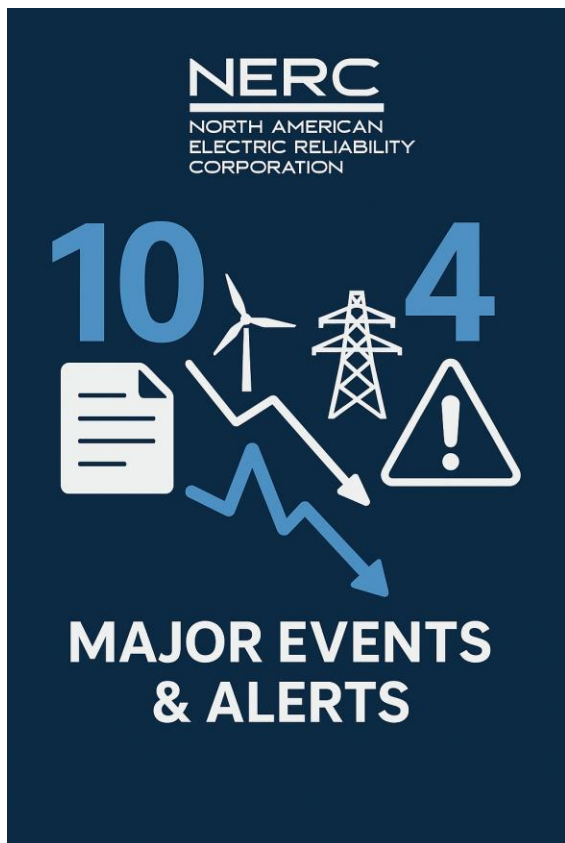
Limitations:

- In some areas operators must have reached energy emergency conditions before using DR
- Contracts with commercial DR customers also limit the number or times DR can be used



Demand Response – Resources (MW) and Percentage of Total Peak Demand

Areas where DR reduces 3% or More of Total Peak Demand



Instances of sudden and unexpected loss of generation during normal grid faults is a serious risk to BPS Reliability as more IBRs come onto the system

NERC has issued Standards, Alerts and Guidelines to reduce risks

Since 2016, NERC has analyzed numerous major events totaling more than 15,000 MW of unexpected generation reduction from solar, wind and battery IBR and some synchronous generation.

In response to these disturbances, NERC has issued 10 major event reports and four Level 2 Alerts. A comprehensive IBR strategy with new standards requirements and guidelines for industry is ongoing.

NERC will issue an Essential Actions to Industry Alert

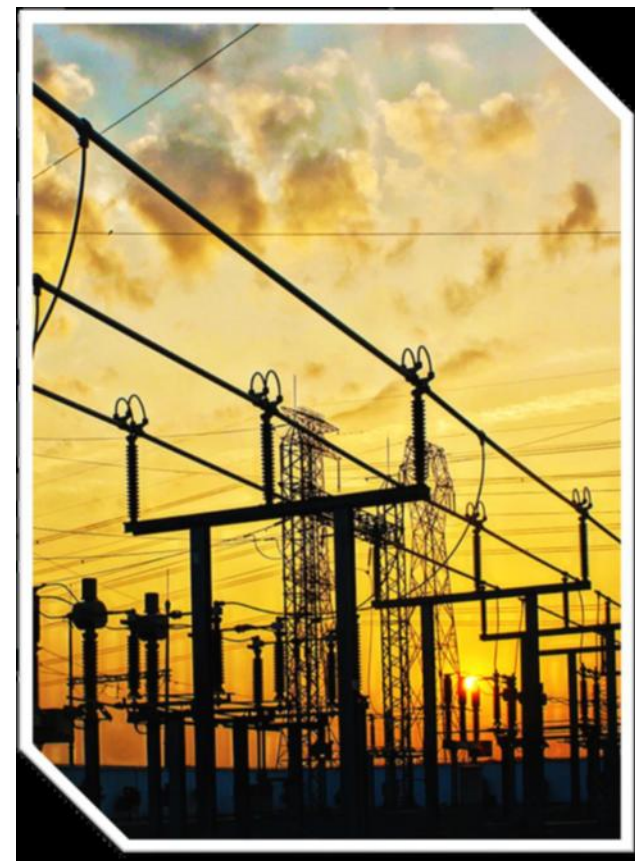
The Level 3 NERC Alert responds to identified IBR model quality deficiencies and will enhance technical requirements and study processes for integrating IBR on the Bulk Power System.

State regulators and administrations:

- Be prepared to implement demand side management in coordination with utilities prior to extreme summer heat
- Review protocols to manage emergent requests for generator environmental waivers if needed for periods of high demand

Grid Owners and Operators:

- Review operating plans for resolving supply shortfalls
- Employ conservative outage coordination procedures
- Consider risks of high forced outages and unexpected loss of generation
- Solar PV and battery resource owners implement recommendations in NERC's Inverter-Based Resource Performance Issues Alert (March 2023)





Questions and Answers