Announcement

Future Electricity Demand and Energy Needs Rising Rapidly; Transmission Hurdles Impact Future Reliability

December 13, 2023

ATLANTA – Sharp increases in peak demand forecasts and the potential for higher generator retirements are raising concerns for electric reliability over the next 10 years. NERC's *2023 Long-Term Reliability Assessment* (LTRA) finds that industry faces mounting pressure to keep pace with accelerating electricity demand, energy needs and transmission system adequacy as the resource mix transitions.

"We are facing an absolute step change in the risk environment surrounding reliability and energy assurance," said John Moura, NERC's director of Reliability Assessment and Performance Analysis. "In recent years, we've witnessed a decline in reliability, and the future projection does not offer a clear path to securing the reliable electricity supply that is essential for the health, safety and prosperity of our communities."

The assessment found growth rates of forecasted peak demand and energy have risen significantly since the 2022 LTRA, reversing a decades-long trend of falling or flat growth rates. Electrification and projections for growth in data centers and electric vehicles are contributing to the higher forecasts. In addition, electrification of heating systems is having a pronounced effect on seasonal demand, causing summer-peaking regions in the U.S. Northeast and Southeast to anticipate a change from summer peak-demand season to winter or even dual-season peaks.

Resource adequacy concerns arise throughout the next 10 years, stemming from higher demand, generator retirements and the potential for replacement resources to fall short of capacity and energy needs. More than 83 GW of fossil-fired and nuclear generator retirements are anticipated through 2033, and more generators have announced plans for retirements. Over the same period, the resource mix continues to transition as wind, solar photovoltaic and battery resources are added. The 2023 LTRA finds that most areas are facing resource adequacy challenges, with many projected to have reserve shortages or emerging energy risks in future years. In addition, the new mix of resources heightens fuel supply concerns as the reliance on just-in-time delivery of natural gas fuel to generation increases.

"The critical interdependence between the electric and gas sectors in this year's assessment stands out as a significant risk to future reliability," said Mark Olson, NERC's manager of

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Reliability Assessment. “Subfreezing temperatures, as seen during Winter Storms Uri and Elliott, can disrupt the natural gas fuel supplies to generators. When this causes an electricity supply shortfall, it can further affect natural gas infrastructure, creating more severe impacts on the energy system as a whole.”

The amount of bulk power system transmission projects reported as “under construction” or “in planning for construction” in the next 10 years has increased. These new transmission projects are being driven to support new generation interconnection and enhance reliability. However, siting and permitting challenges continue to impose delays in transmission expansion planning. While regional transmission planning processes are adapting to manage the energy transition, impediments to transmission development remain.

The energy and capacity analysis identifies an expanding area for future potential electricity shortfalls. Most areas are projected to have adequate electricity supply resources to meet demand forecasts associated with normal weather; however, there are two areas identified as not having the reserves to meet resource adequacy criteria:

- **Midcontinent Independent System Operator (MISO):** New resource additions have overcome the planning reserve deficits that were reported in the 2022 LTRA and projected to occur in 2023. Beginning in 2028, MISO is projected to have a 4.7 GW shortfall if expected generator retirements occur, despite the addition of new resources that total more than 12 GW.
- **SERC-Central:** There is a shortfall in planned reserves in the 2025–2027 period as demand forecasts increase faster than the transitioning resource mix grows. This assessment area will add more than 7 GW of natural gas generation and retire more than 5 GW of coal generation over the period.

The assessment identifies four recommendations for energy policymakers, regulators and industry to promote actions to reliably meet growing demand and energy needs while the resource mix transitions:

- Add new resources with reliability attributes, manage retirements and make existing resources more dependable
- Expand the transmission network to provide more transfer capability
- Adapt bulk power system planning, operations, resource procurement markets and processes to a more complex power system
- Strengthen relationships among reliability stakeholders

Undertaken annually in coordination with the Regional Entities, NERC’s 2023 LTRA is the Electric Reliability Organization’s independent assessment and comprehensive report on the adequacy of planned bulk power system resources to reliably meet the electricity demand across North America over the next 10 years.

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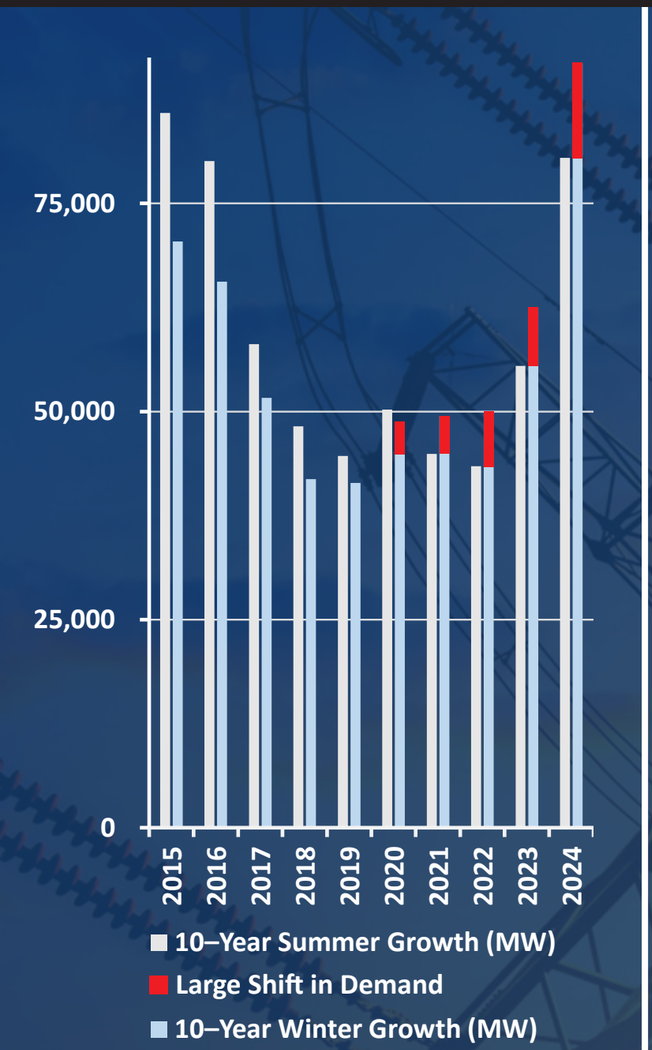
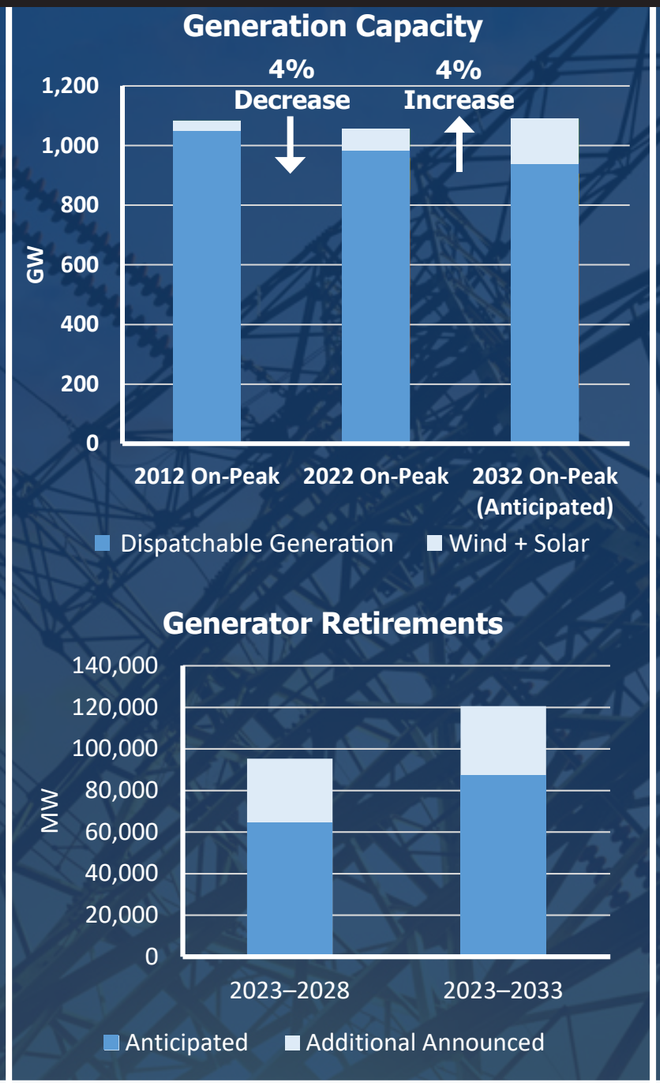
Electricity is a key component of the fabric of modern society and NERC, as the Electric Reliability Organization, serves to strengthen that fabric. The vision for the ERO Enterprise, which is comprised of NERC and the six Regional Entities, is a highly reliable and secure North American bulk power system. Our mission is to assure the effective and efficient reduction of risks to the reliability and security of the grid.

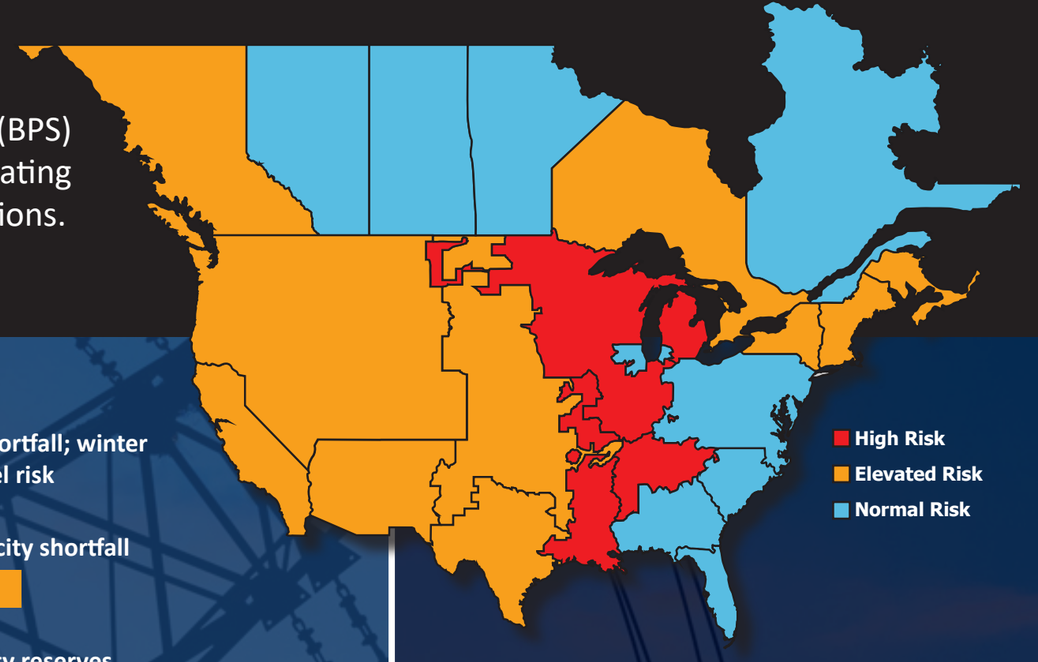
Long-Term Reliability Assessment 2023

The LTRA identifies reliability trends, emerging issues, and potential risks to the bulk power system (BPS) over a 10-year assessment period. Industry faces mounting pressure to keep pace with accelerating electricity demand, energy needs, and transmission system adequacy as the resource mix transitions.

LTRA | Video







High Risk Areas

MISO
2028: Capacity shortfall; winter generator and fuel risk

SERC-Central
2025–2027: Capacity shortfall

Elevated Risk Areas

Maritimes
2026: Low capacity reserves

New England
2024: Winter fuel supply risk

New York
2025: Low capacity reserves

Ontario
2028: Low capacity reserves

SPP
2024: Winter generator and fuel risk; insufficient dispatchable resources

ERCOT
2024: Winter generator and fuel risk; insufficient dispatchable resources

WECC-BC
2026–2027: Low capacity reserves

WECC-CA/MX
2026: Insufficient dispatchable resources

WECC-NW
2026: Insufficient dispatchable resources

WECC-SW
2026: Insufficient dispatchable resources

- Add new resources with reliability attributes, manage retirements, and make existing resources more dependable
- Expand the transmission network to provide more transfer capability and deliver supplies from new resources and locations to serve changing loads
- Adapt BPS planning, operations, resource procurement markets, and processes to a more complex power system
- Strengthen relationships among reliability stakeholders and policy makers

Demand Growth

The BPS is currently forecast to have its highest demand and energy growth rates since 2014, mainly driven by electrification and projections for growth in electric vehicles over this assessment period.

Generation Trends

As fossil generation is retired, resource growth is becoming more challenging. More than 83 GW of generator retirements are planned through 2033, and more are expected. Generation plans need to consider growing energy needs and grid stability.

Resource Adequacy Risk

Capacity shortfalls are projected in areas where future generator retirements are expected before replacement resources can be put in service to meet rising electricity demand.

Priority Actions

Natural gas supply infrastructure and the BPS form an interconnected energy system. NERC endorses actions to establish reliability rules for the natural gas infrastructure that is necessary for an interconnected energy system.