

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

Reliably Managing the Energy Transition in North America

A Bulk Power System Reliability Perspective

John Moura

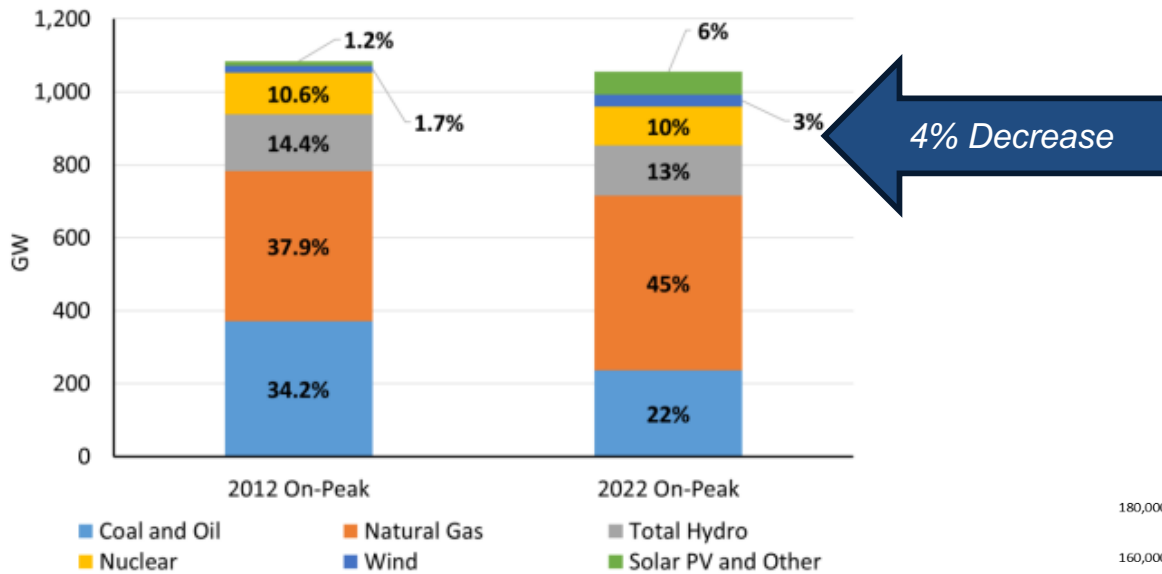
NASEO

September 30, 2024 – New York City

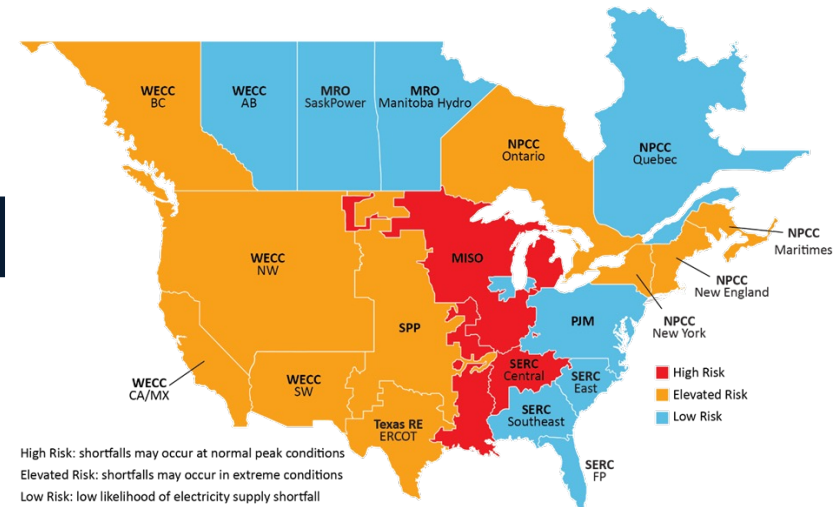
RELIABILITY | RESILIENCE | SECURITY



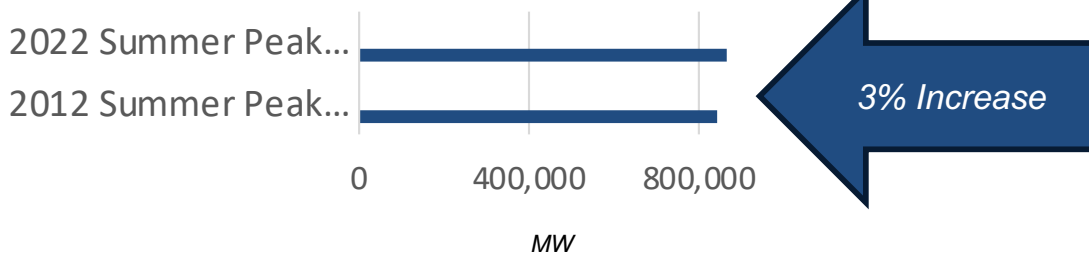
2012 and 2022 Peak Capacity Resource Mix NERC-Wide



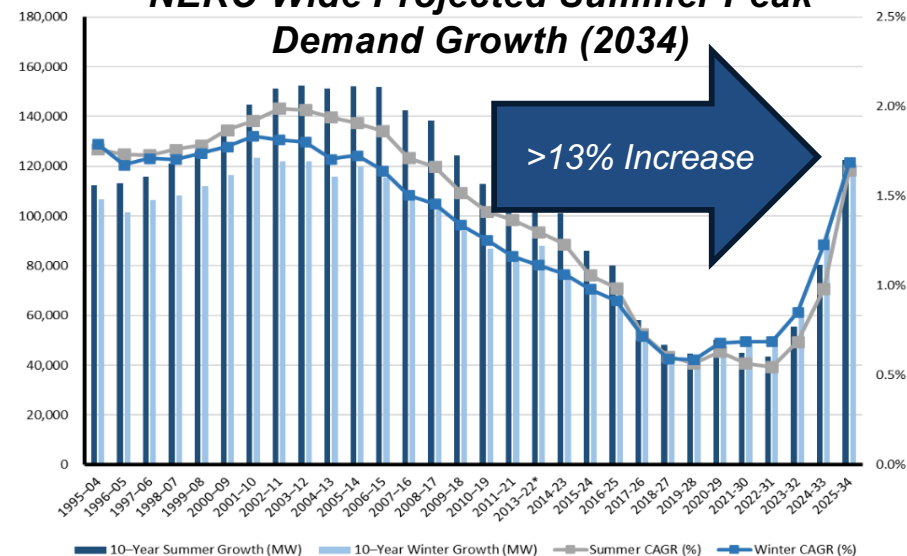
2024-2033 Risk Areas



NERC-Wide Summer Peak Demand Changes 2012 and 2022

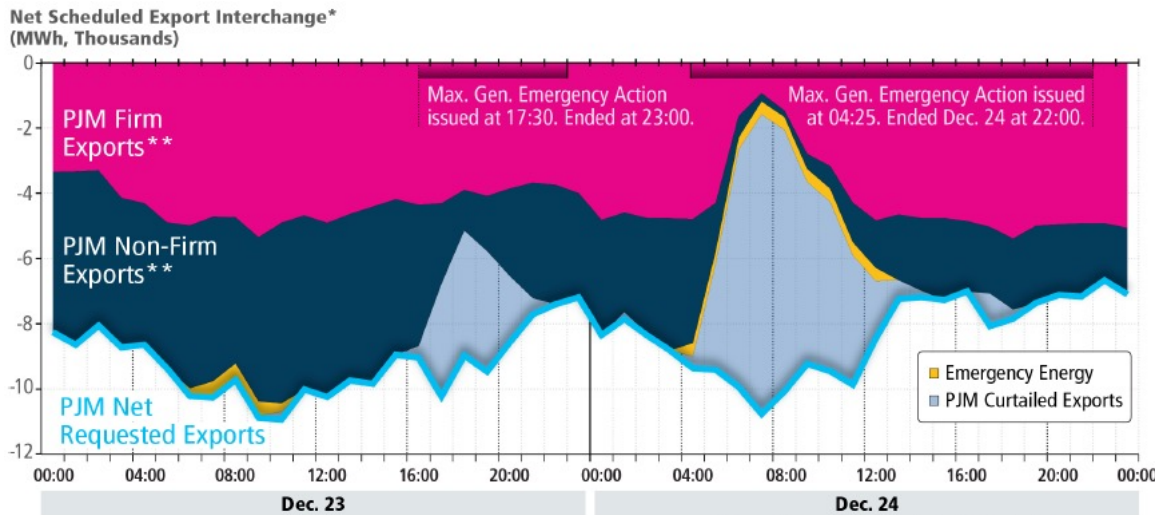
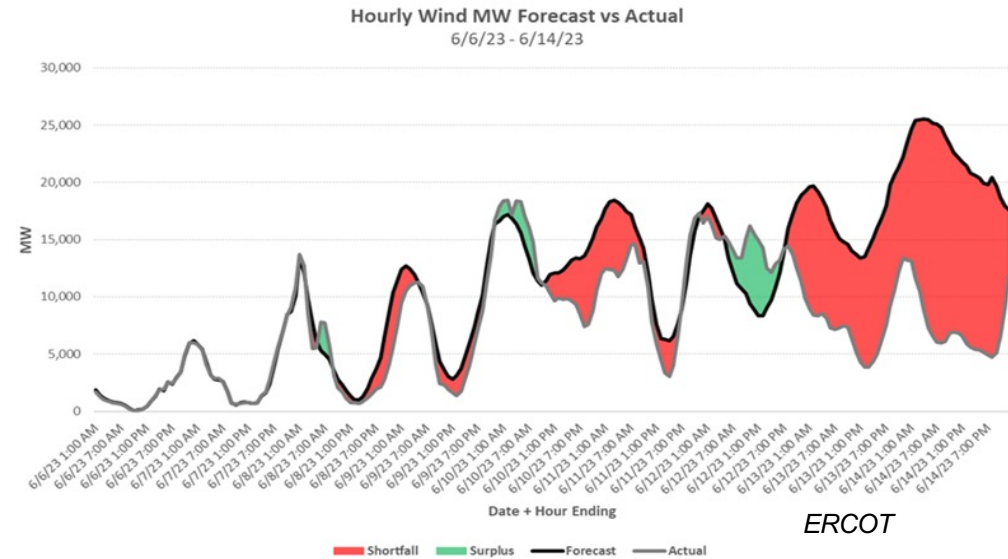


NERC-Wide Projected Summer Peak Demand Growth (2034)



Recent Examples Highlight Need for Wide-Area Energy Assessments

June 6, 2023: ERCOT, SPP, MISO: A “wind drought” caused 60 GW of installed wind capacity to generate 300 MW

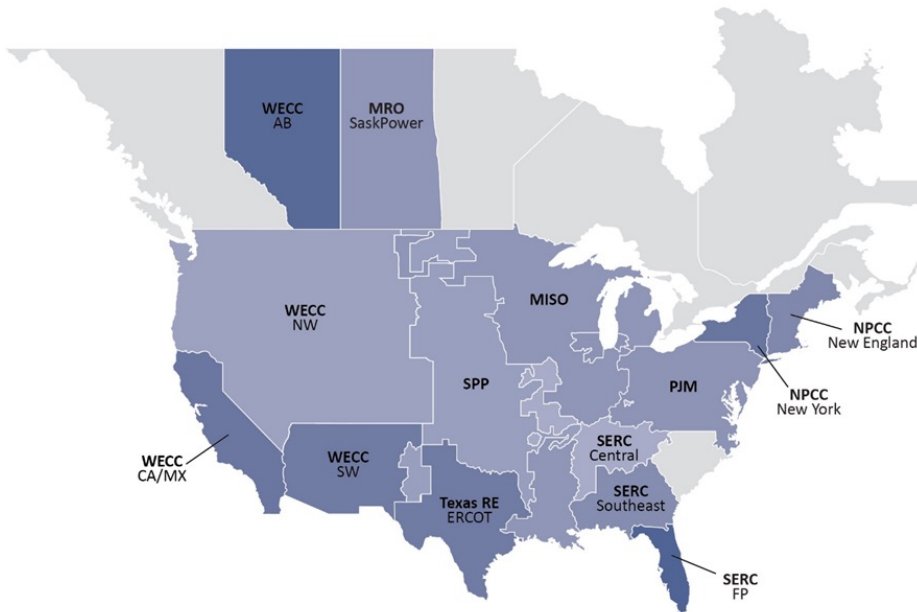


*Dynamic Transfers not included; **Excludes Emergency

December 24, 2022: PJM: Transmission system during extreme cold weather limited the ability to export to support southern neighbors



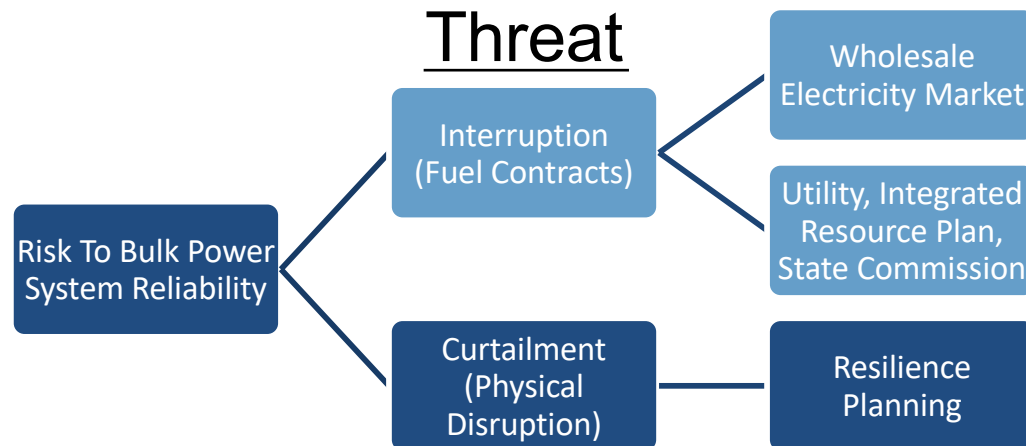
Interconnected Natural Gas and Electric Systems: Essential for Winter Reliability



All other assessment areas have less than 35% natural gas fired generation contribution to winter resource mix.

	Natural-Gas-Fired Generation	
	Peak Winter Capacity	Contribution to Total Winter Resource Mix
MISO	67.5 GW	46%
MRO-SaskPower	2.1 GW	46%
NPCC-New England	17.3 GW	54%
NPCC-New York	24.5 GW	66%
PJM	84.9 GW	47%
SERC-Central	22.7 GW	44%
SERC-Florida Peninsula	50.6 GW	79%
SERC-Southeast	31.5 GW	51%
SPP	27.4 GW	41%
Texas RE-ERCOT	54.2 GW	62%
WECC-AB	11.4 GW	75%
WECC-CA/MX	39.9 GW	65%
WECC-NW	31.0 GW	39%
WECC-SW	18.2 GW	62%

Natural-Gas-Fired Generation Capacity Contributions to 2023–2024 Winter Generation Mix

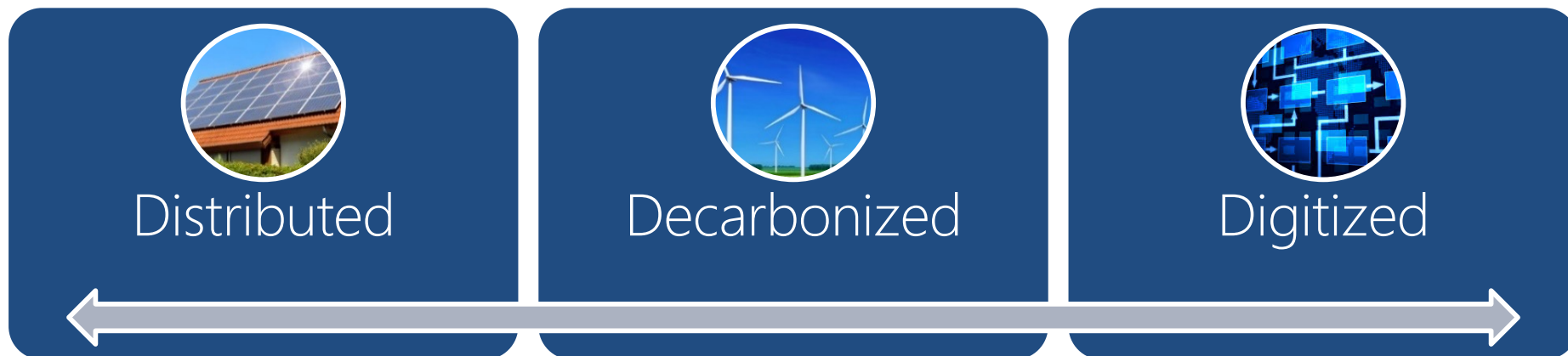


Solution Space

Similarities in Past Extreme Cold Weather Events

	2011 Event	2014 Event	2018 Event	2021 Event	2022 Event
Significant levels of incremental unplanned electric generating unit losses with top causes found to be mechanical/electrical, freezing, and fuel issues.	✓	✓	✓	✓	✓
Significant natural gas production decreases occurred, with some areas of the country more severely affected.	✓			✓	✓
Short-range forecasts of peak electricity demands were less than actual demands for some BAs in event area	✓		✓	✓	✓

Extreme Winter Events		
Event	Geographic Area	Unavailable Generation (MW)
February 1–5, 2011	Texas and Southwest	14,702
January 6–8, 2014 (Polar Vortex)	Midwest, South Central, East Coast	9,800
January 15–19, 2018	South Central	15,600
February 8–20, 2021 (Winter Storm Uri)	Texas and South Central	65,622
December 21–26, 2022 (Winter Storm Elliott)	Central, Midwest, large parts of Southeast and Northeast	90,500



Must Wins:

1. **Build more capacity and manage the pace of transformation** through market mechanisms and inter-agency coordination on policies that impact generation.
2. Ensure a robust **energy supply chain** for the balancing resources, with sufficient access to fuel and stored energy to withstand long-duration, wide-spread extreme weather events
3. Develop sufficient **transmission**, to integrate renewables and distribute them, make the system more resilient
4. Maintain a robust fleet of **balancing resources**, with an ability to provide **Essential Reliability Services** to ensure inverter-based resources don't negatively impact reliability
5. **STATES:** Refine resource adequacy requirements that preserves energy assurance

A stylized map of North America, including the United States, Canada, and Mexico. The map is rendered in shades of blue and grey. A horizontal blue bar with a gradient is overlaid across the middle of the map, containing the title text.

Questions and Answers