<Public>

Winter Reliability and Electric-Gas Coordination

Matthew Zapotocky
Senior Reliability Assessments Engineer

Electric Reliability & Security for the West

November 4, 2025

- Western Interconnection
- Reliability Concerns
- Extreme Cold
- Extreme Cold Weather Study
- Gas-Electric Coordination in the West
- Winter Reliability Assessment

Western Interconnection at a Glance

158,332 TOTAL
Miles of transmission lines

90+ MILLION
People living in the Western Interconnection

168.2 GW
Interconnection peak demand

448
Registered Entities

329
Generation Owners

52
Transmission Operators

37
Balancing Authorities

4
Reliability Coordinators

Reliability Concerns

Top Reliability Concerns in the West		
Season	**Reliability Concern**	**% of WECC Members**
Summer	Extreme Heat Events	60%
Winter	Extreme Cold Events	58%
Summer	Wildfires	49%
Year-Round*	Solar Variability	35%
Year-Round	Wind Variability	33%
Year-Round	Hydro Variability	27%
Year-Round	Aging Thermal Fleet	23%
Winter*	Outage Coordination	23%
Summer	Delays in Resource Completion	23%
Summer	BTM/DER Variability	23%

*Solar variability followed by outage coordination are the most prevalent concerns during the shoulder seasons.

"Brace yourself, winter is coming…."

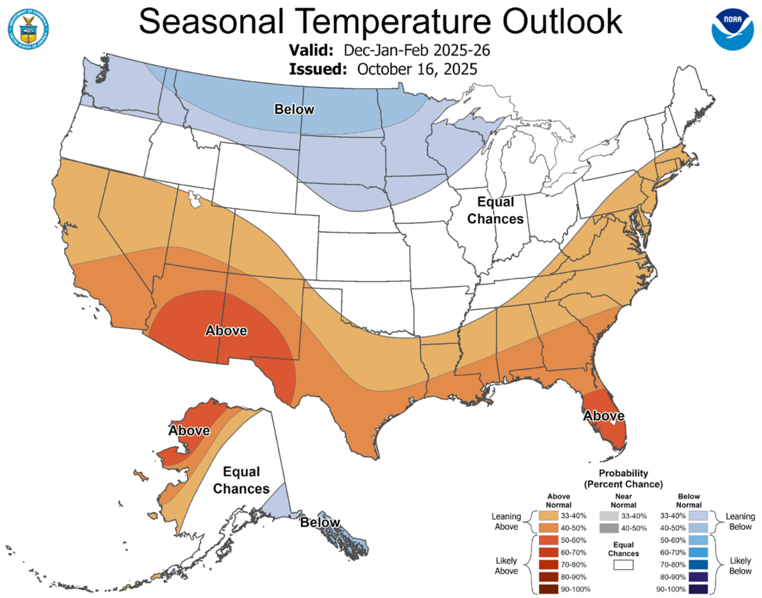
Extreme Cold

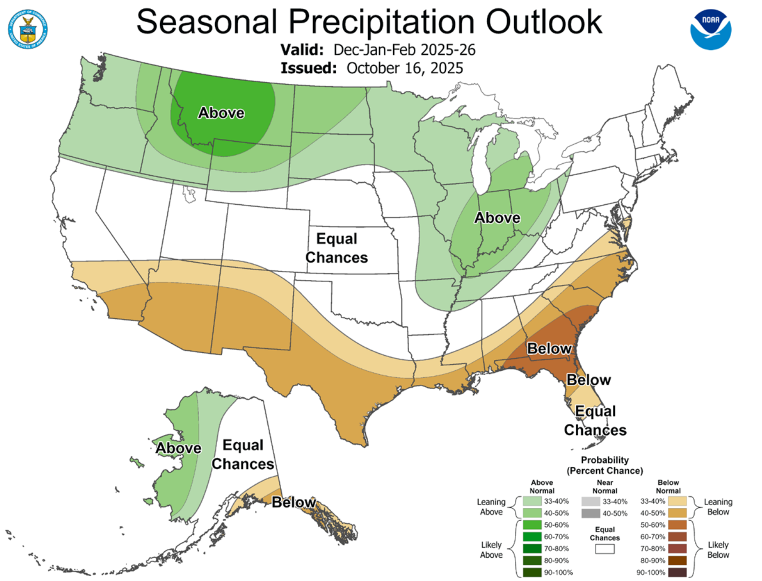
Primarily cited as a concern in the Northwest and Canada

Winter Storms Gerri/Heather:

- Low temperatures—elevated demand
- Turbine blade icing—wind derates
- Minimal solar availability
- Gas delivery constraints
- Unplanned transmission outages
- Unplanned generator outages
- Bilateral market exhaustion

- **5 Energy Emergency Alerts during the same event across different BAs (63 hours of EEAs over four days)**

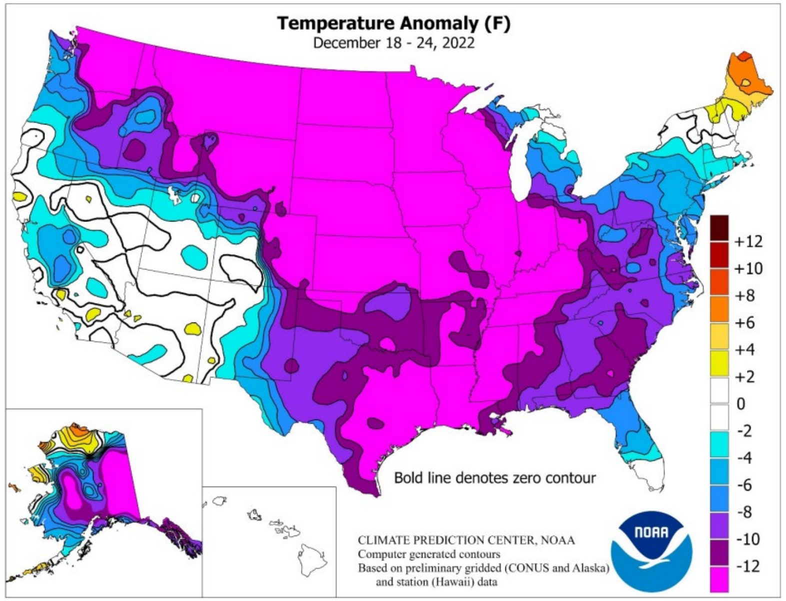


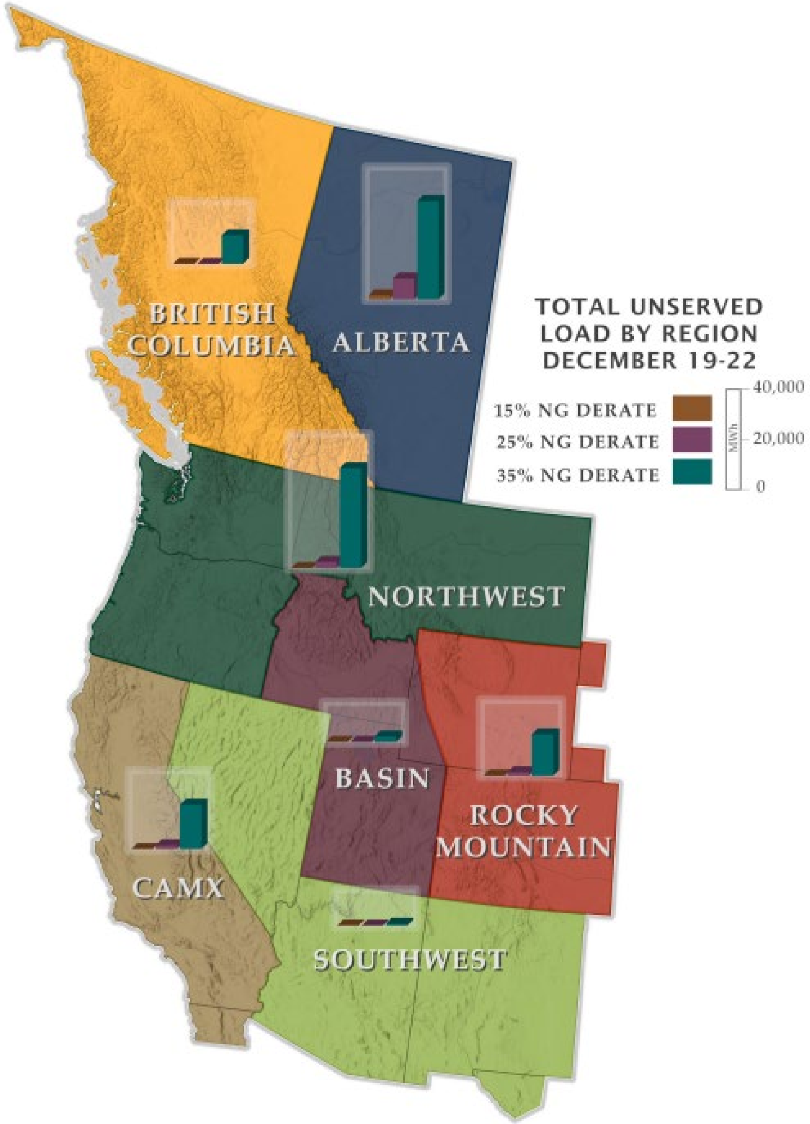


WECC

2032 Extreme Cold Weather Study

- Winter Storm Elliott load shape and incremental demand
- Doubled forced outage rates
- Historic lows for wind and solar output
- Reduced natural gas availability by 15%, 25%, & 35%





Link to extreme cold weather studies: [StS | Western Electricity Coordinating Council]

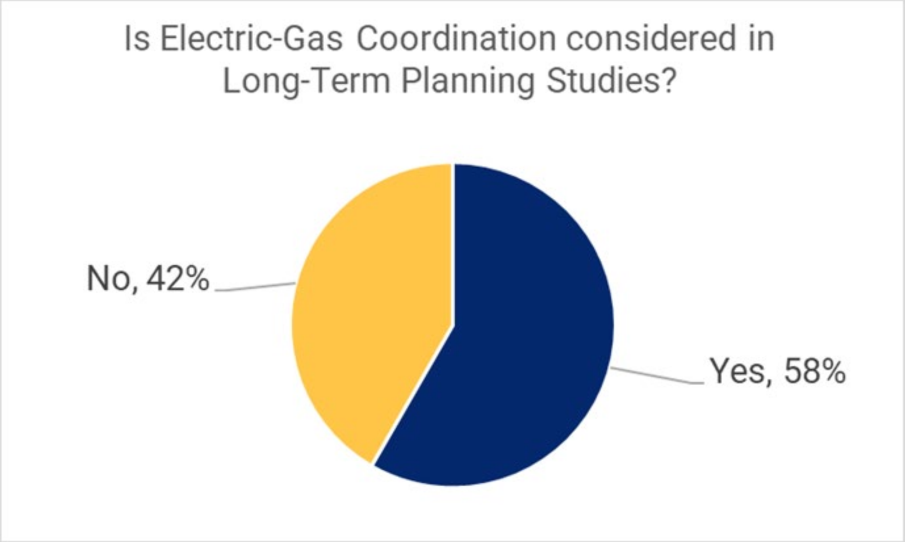
Gas-Electric Coordination

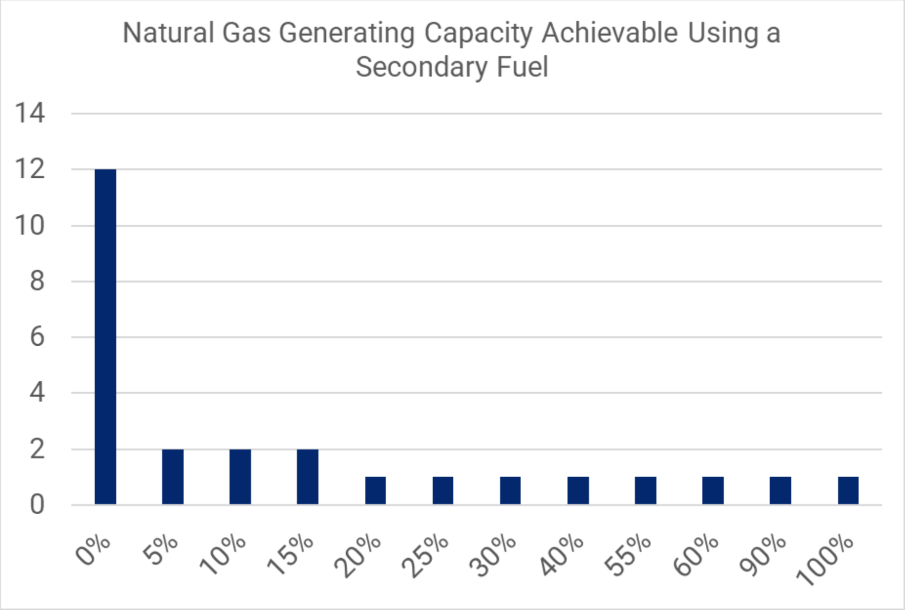
Long-Term Planning

- Pipeline constraints
- Contract terms
- LDC and generation analyzed in tandem to determine contract needs

Operations

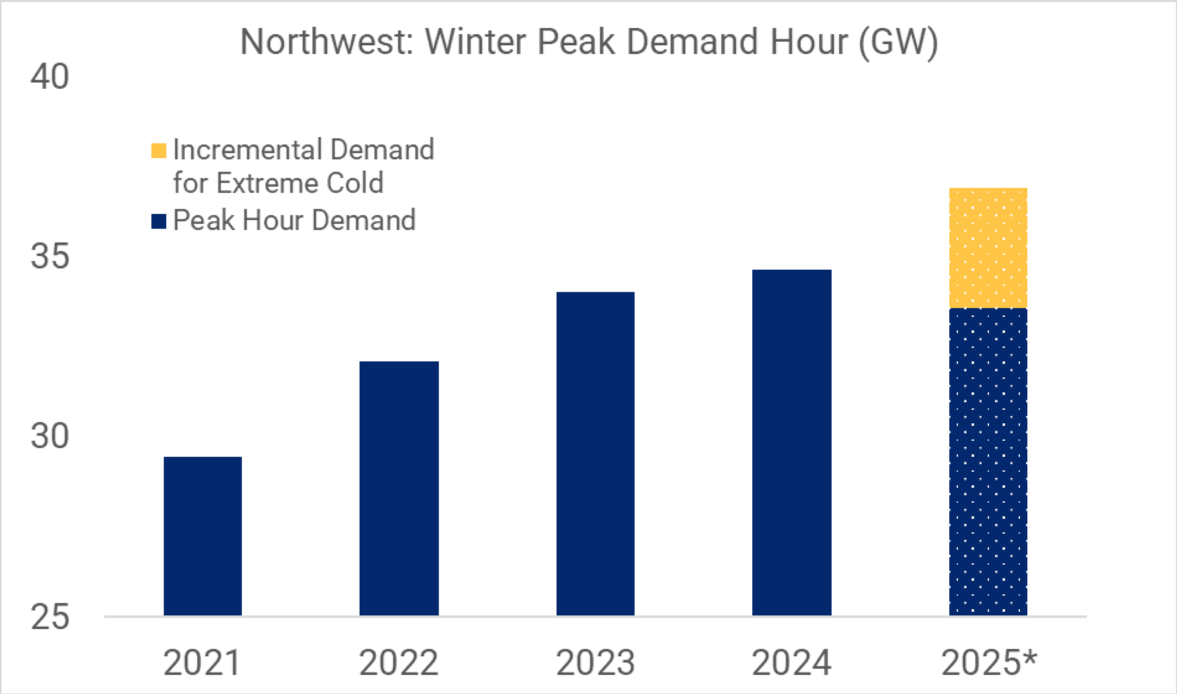
- Mutual assistance agreements
- Daily communication between gas suppliers and system operators
- Emergency scenario simulations
- Secondary fuel (e.g. fuel oil)
- Working groups

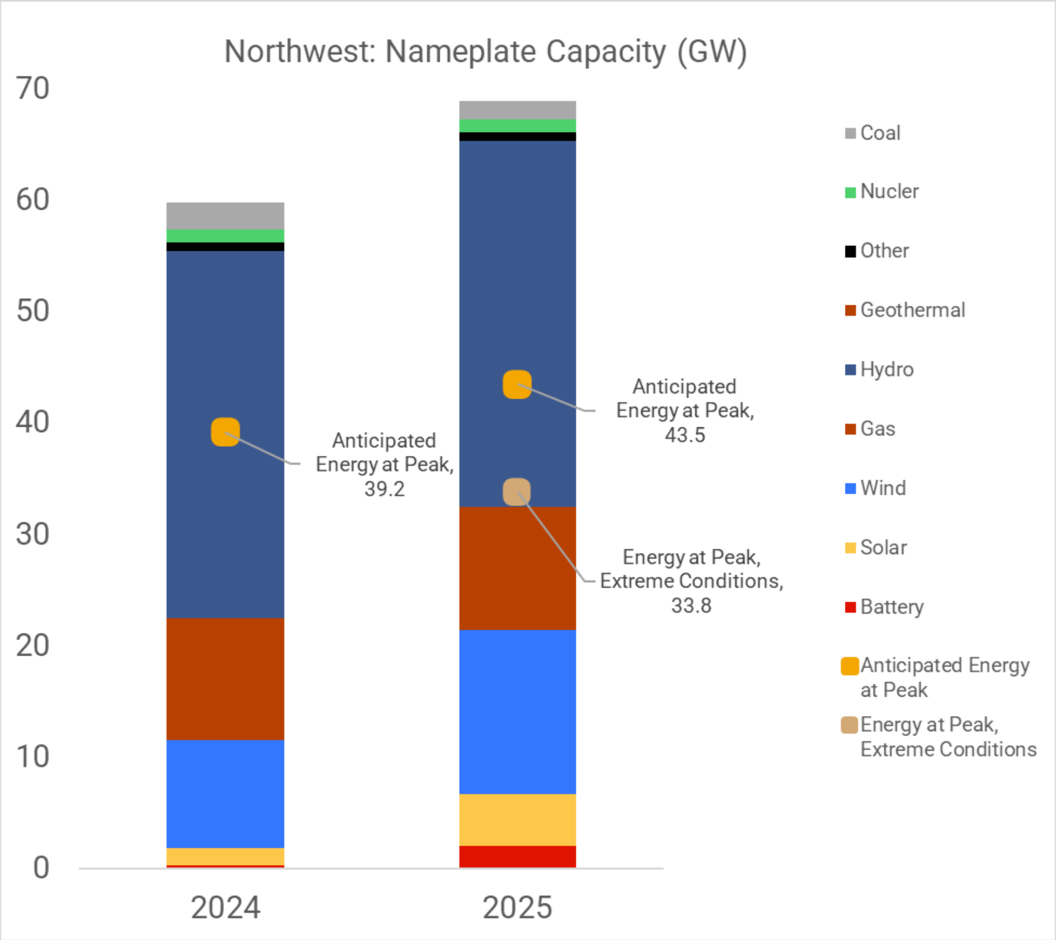




Winter Reliability Assessment (Preliminary)

- Reports on areas with reliability concern this winter (Dec 2025 –Feb 2026)
- Existing + Tier 1 Resources (under construction, operable in WRA timeframe)
- Focused on peak demand hour
- Nameplate capacity ≠ energy at peak





WECC

WWW.WECC.ORG | (801) 582-0353

155 N 400 W, Salt Lake City, UT 84103, USA

NERC's Winter Reliability Assessment

Preliminary Findings for Winter Readiness

Gerad M. Freeman, Ph.D., Senior Engineer, Reliability Assessment

Washington Utilities and Transportation Commission Winter Resource Adequacy Meeting
November 4, 2025

2025-2026 Winter Reliability Assessment

- NERC and the six Regional Entities began collecting data and inputs for the 2025-2026 Winter Reliability Assessment in July
- Capacity and energy risk assessment for 23 North American BPS areas based on both deterministic scenarios and probabilistic evaluations of all risk periods
- Added focus this winter on rapid increases in demand and fuel supply concerns

Seasonal Risk Assessment Criteria		
Risk Level	**Deterministic**	**Probabilistic**
High Indication of insufficient operating reserves or energy shortfalls in normal peak conditions	• Planning reserve margin does not meet reference margin level, **or** • Risk period analysis indicates resources will not be able to sustain operating reserve requirements under **normal peak-day demand and typical resource outage scenarios**	• Seasonal Normalized Expected Unserved Energy **is greater than 0.002%** (20 ppm), **or** • Seasonal Loss of Load Hours **is greater than 2.4 hours**

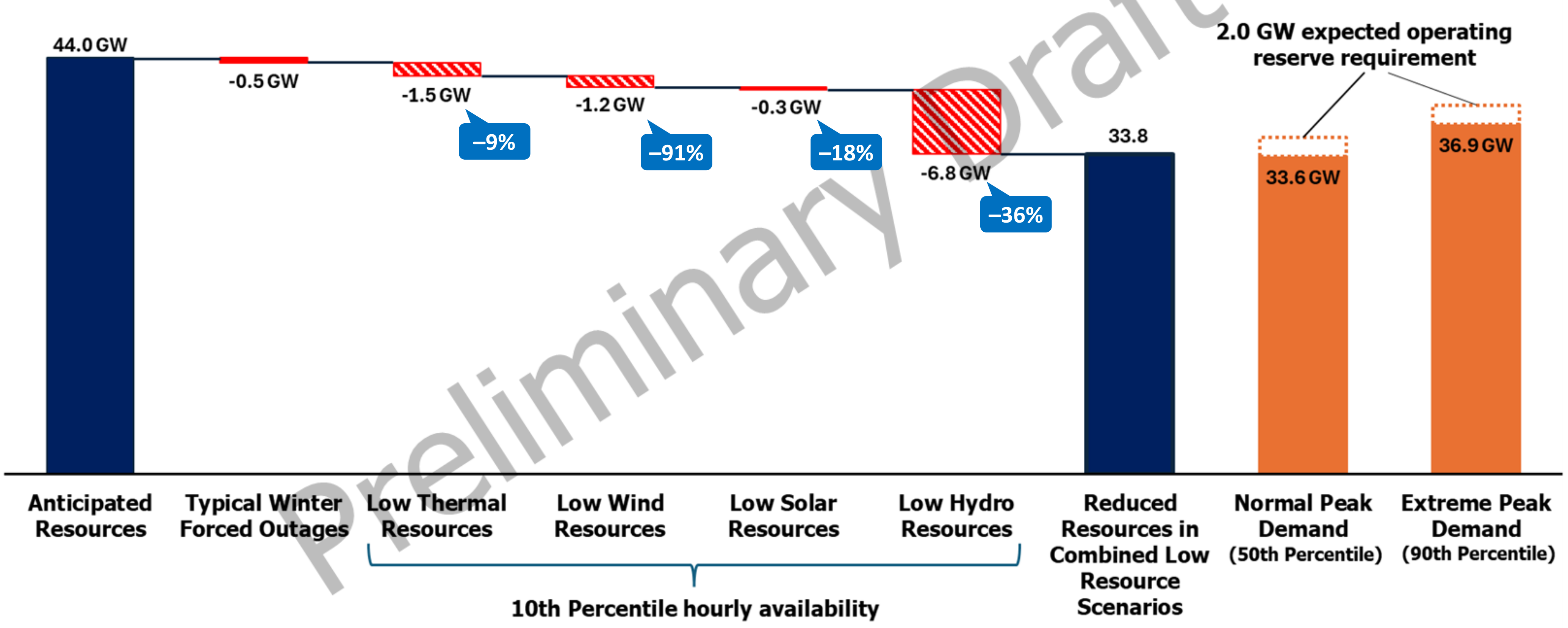
Elevated
Indication of insufficient operating reserves or energy shortfalls in above-normal conditions
	• Risk period analysis indicates resources will not be able to sustain operating reserves under:
	  • **above-normal peak-day demand and normal resource outage levels, or**
	  • **normal peak-day demand and above-normal resource outage levels**
		• Seasonal Normalized Expected Unserved Energy is **greater than zero and less than 0.002%** (20 ppm), **or**
		• Seasonal Loss of Load Hours **is greater than 0.1 hours and less than 2.4 hours**

Normal Indication of sufficient operating reserves and energy shortfalls not expected	• Risk period analysis indicates resources will be sufficient to meet operating reserves under normal **and** above-normal peak-day demand and resource outage scenarios	• Seasonal Normalized Expected Unserved Energy **is negligible**, **and** • Seasonal Loss of Load Hours is **less than 0.1 hours**

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

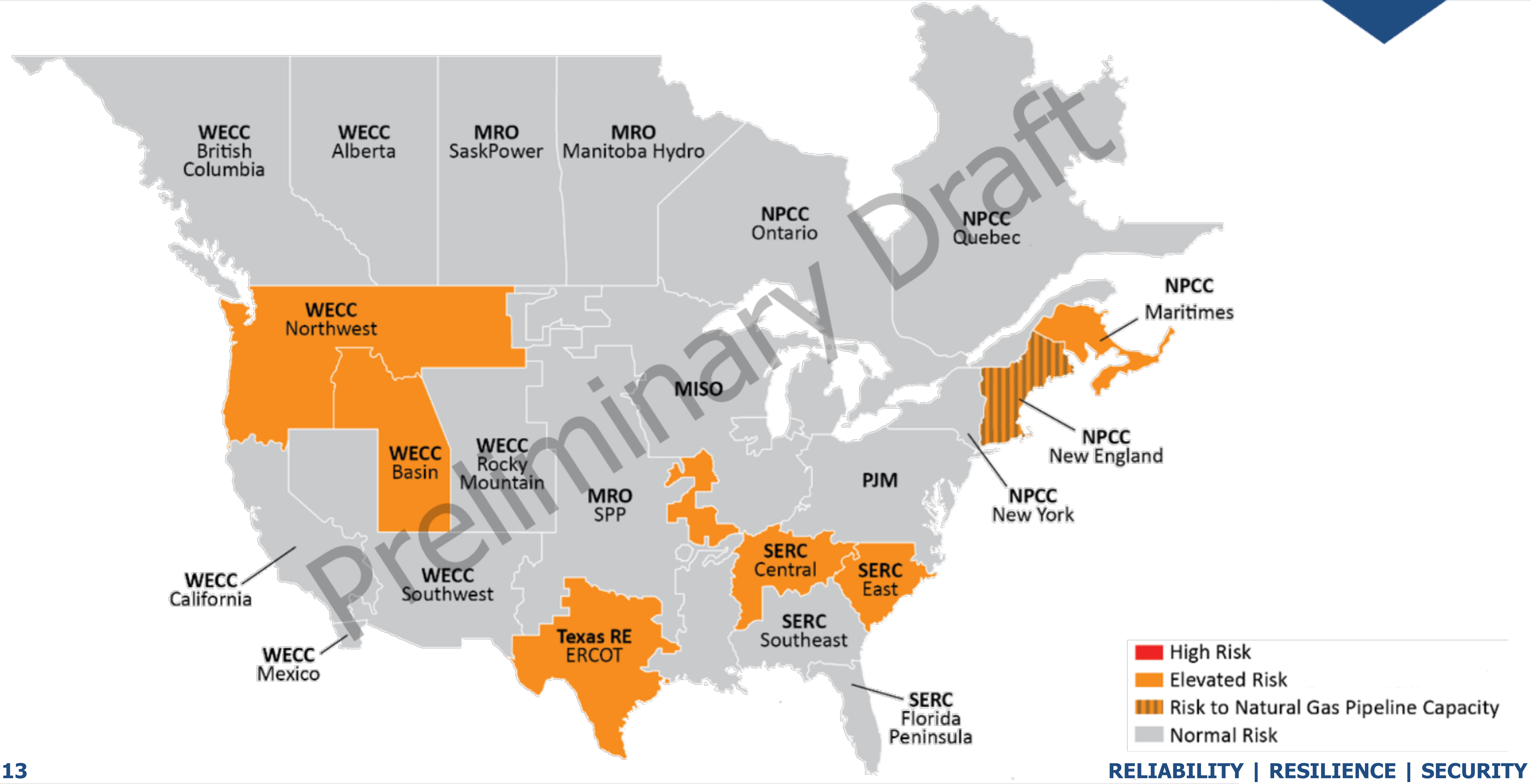
Deterministic Risk Period Analysis for WECC-Northwest

Winter reliability assessment examines each NERC Assessment Area’s ability to meet operating reserve requirements under stressed conditions



NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Multiple regions face an elevated risk of operating reserve or energy shortfalls during the upcoming winter season



NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

2025-2026 NERC Winter Reliability Assessment: Key Gas-Electric Themes

Continent-Wide Gas-Electric Winter Risk Themes

- Increased variable energy resources have led to higher dependence on gas-fired resources, especially in the winter
- Many areas express a concern about extended cold-snaps and the effect they would have on fuel availability for the gas-fired generator fleet
- Potential risks related to natural gas transportation capacity in areas with high pipeline utilization, competition for delivered gas/firm supply, and ratable flow requirements that could affect combustion turbine operations

Focus on awareness and coordination

- **Increased importance of gas-electric coordination when faced with accelerated coal-fired retirements**
- **Regional tabletop exercises with gas and electric operators to simulate emergency scenarios and improve readiness**
- **Increased participation by natural gas industry in BPS regional planning and coordination organizations**
- **Weekly/sub-weekly monitoring and BPS alerting of regional fuel adequacy during times of natural gas pipeline constraint and real-time coordination with the gas industry**

Mitigations are being implemented

- **Updated pipeline operation logic and expedited emergency protocols**
- **Limited duration support from battery energy storage system capacity increases**
- **Increased focus on winterization and inspection of key gas and electric system elements**
- **Electric market service to ensure preparedness for potential winter gas restrictions**
- **Entities updating internal protocols, securing third-party gas supply options, and dual-fuel capability to strengthen winter readiness.**
- **Pre-event unit cycling minimization, early unit startup, unit commitment adjustments based on anticipated reliability, congestion, and capacity needs**

Questions and Answers