

OHIO ELECTRIC COOPERATIVES SUMMER CONFERENCE

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The sole purpose of this presentation is to provide technical reliability-related information based on ReliabilityFirst's expertise. This communication is not intended to be and should not be interpreted as advocating for a specific position or outcome.

THE ERO AND RELIABILITYFIRST



Our mission is to ensure the reliability and security of the bulk power system



We are an objective and independent resource



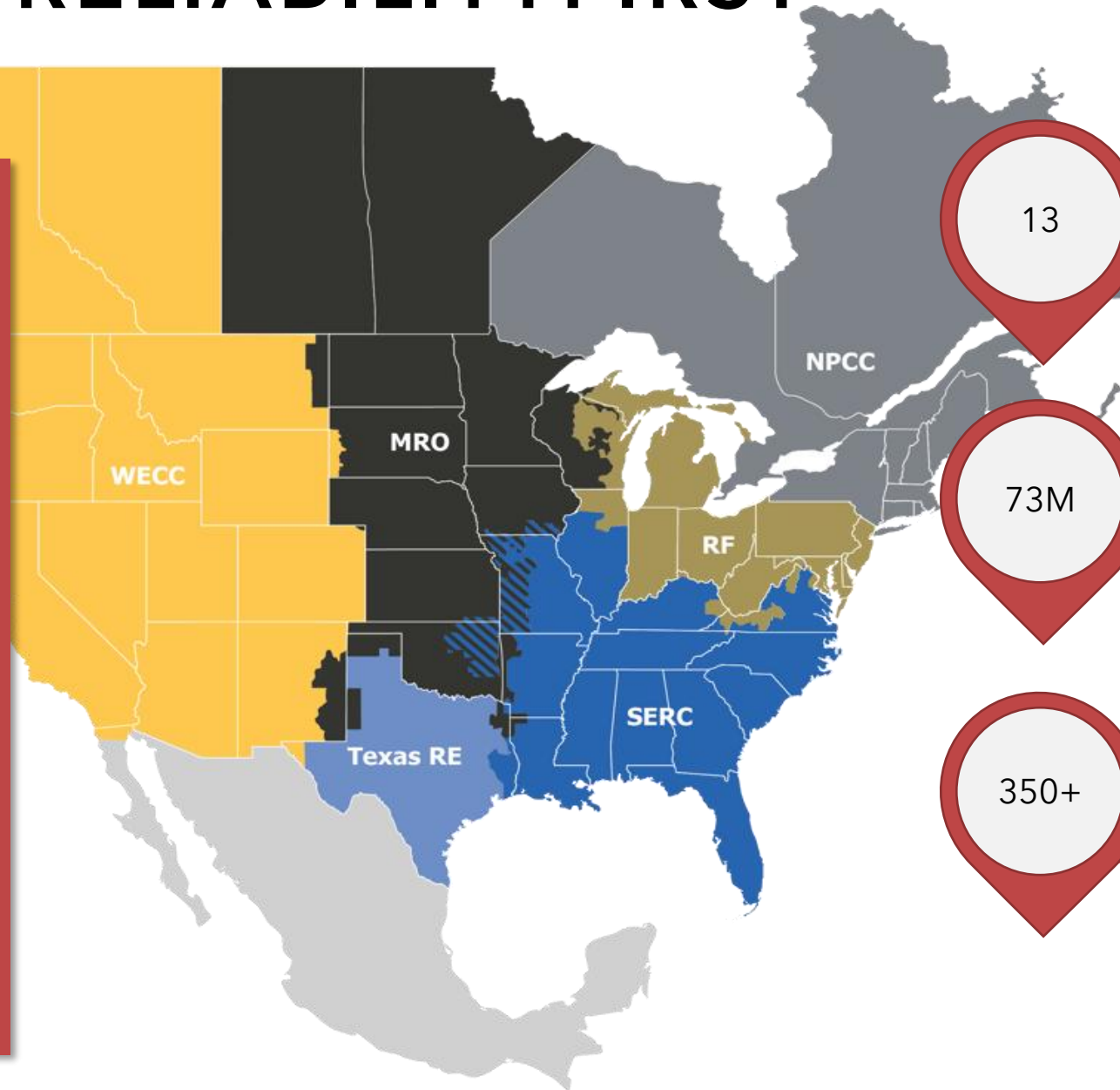
We, along with the other regional entities & NERC, make up the ERO Enterprise



We are regulators of the electric industry



We do not own or operate grid assets or energy markets



13

Number of States and DC

73M

Estimated Population

350+

Registered Entities

ERO JURISDICTIONS

FEDERAL POWER ACT

01 Section 215(c)

Section 215(c) states that the Electric Reliability Organization (ERO) has the ability to **develop and enforce, reliability standards** that provide an adequate level of reliability of the bulk power system

02 Section 215(g)

Section 215(g) requires that the ERO conduct periodic **assessments of the reliability and adequacy** of the bulk power system.

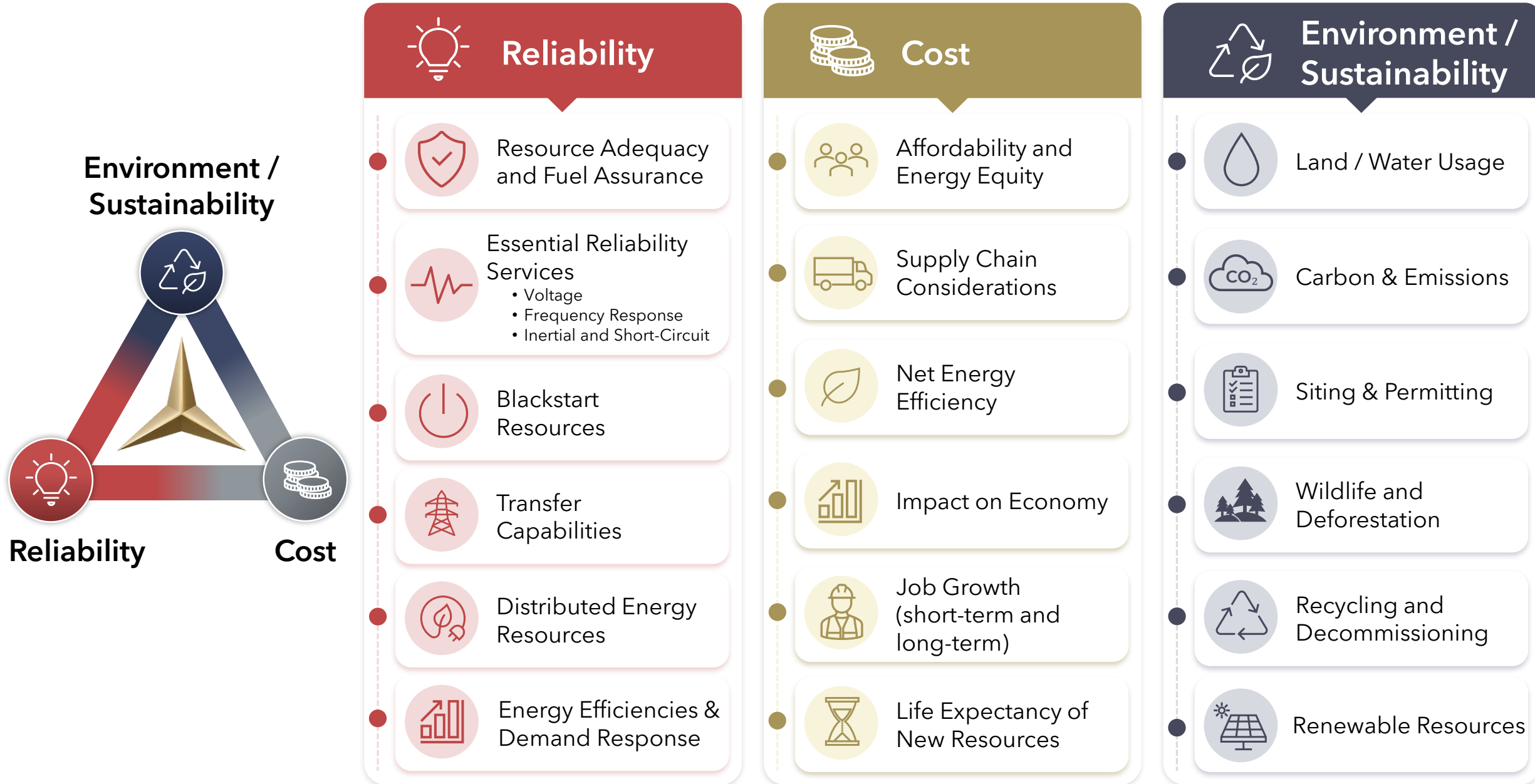
03 Section 215(i)

Section 215(i) states that the ERO **does not** have the authority to set or enforce mandatory standards for **adequacy or safety** of electric facilities or services.

04 Statute

The statute makes clear that the ERO **does not** have the authority to require the **construction** of generation or transmission assets.

ENERGY TRILEMMA CONSIDERATIONS



"HYPER-COMPLEX" RISK ENVIRONMENT



Resource Adequacy Challenges

- Retirements, growth
- IBR growth/integration
- Natural gas interdependencies



Extreme Weather Complexities

- Extreme not infrequent
- Broader, deeper, longer



Energy & Environmental Policy

- Electrification
- Emissions
- Siting and Permitting



Evolving Threat Landscape

- Software vulnerabilities
- Supply chain
- Ransomware
- Physical attacks



Loss of Key "Essential Reliability Services"

- Inertia/frequency response
- Reactive Power/voltage support
- Dispatchability
- Charging/Large Loads

Rapidly changing security needs

- Supply chain protections
- "One to many" attacks
- Low impact protections

Growing Affordability Concerns

- Capital needs
- Capital cost environment

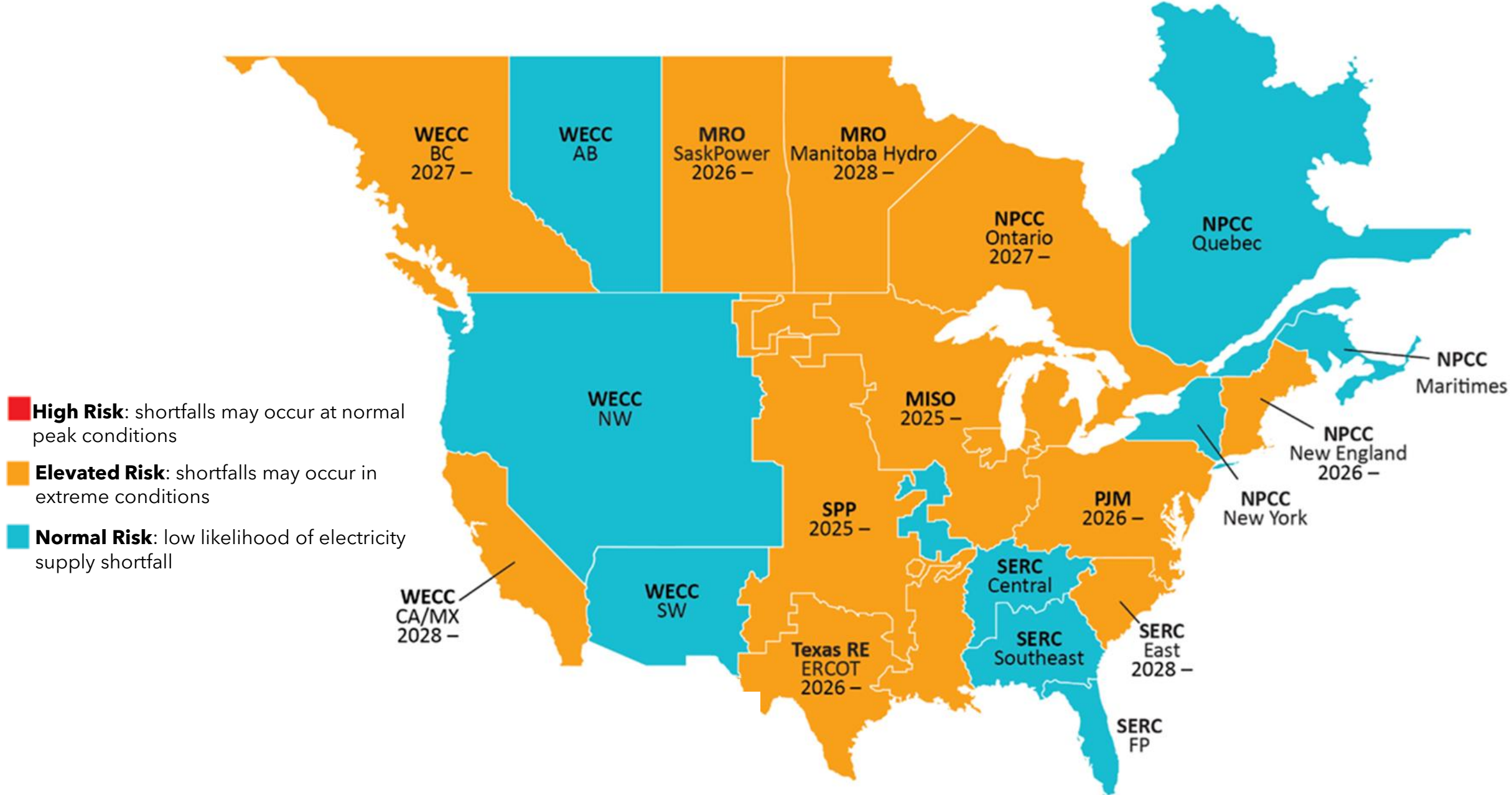
Expanding Cyber Attack Surface

- Industry Control Systems (ICSs)
- IBRs, DERs, EV Charging, Large Loads

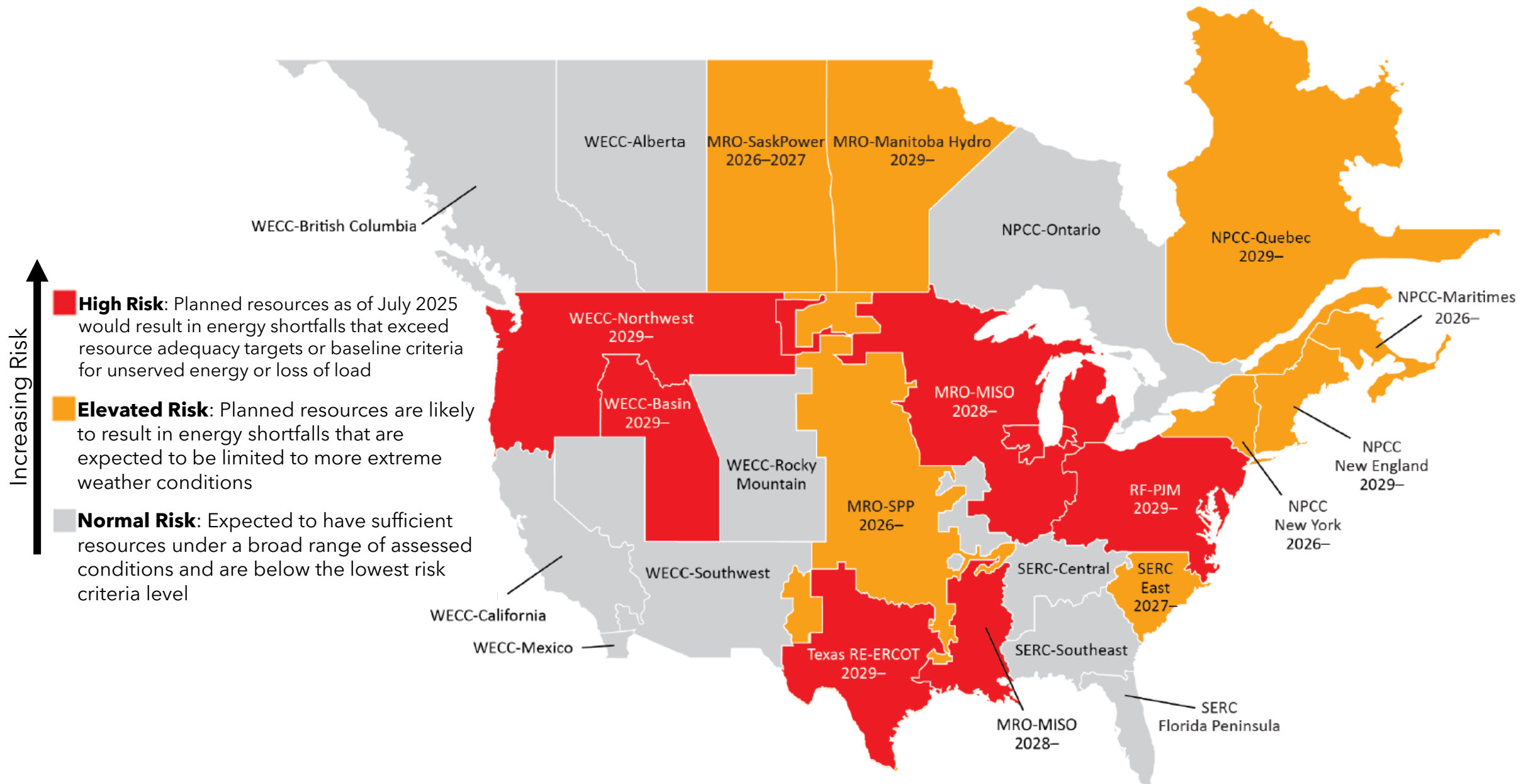
Increasing Concentration of Risk

- Common mode failure
- Declining fuel diversity

RESOURCE ADEQUACY: NERC 2024 LTRA



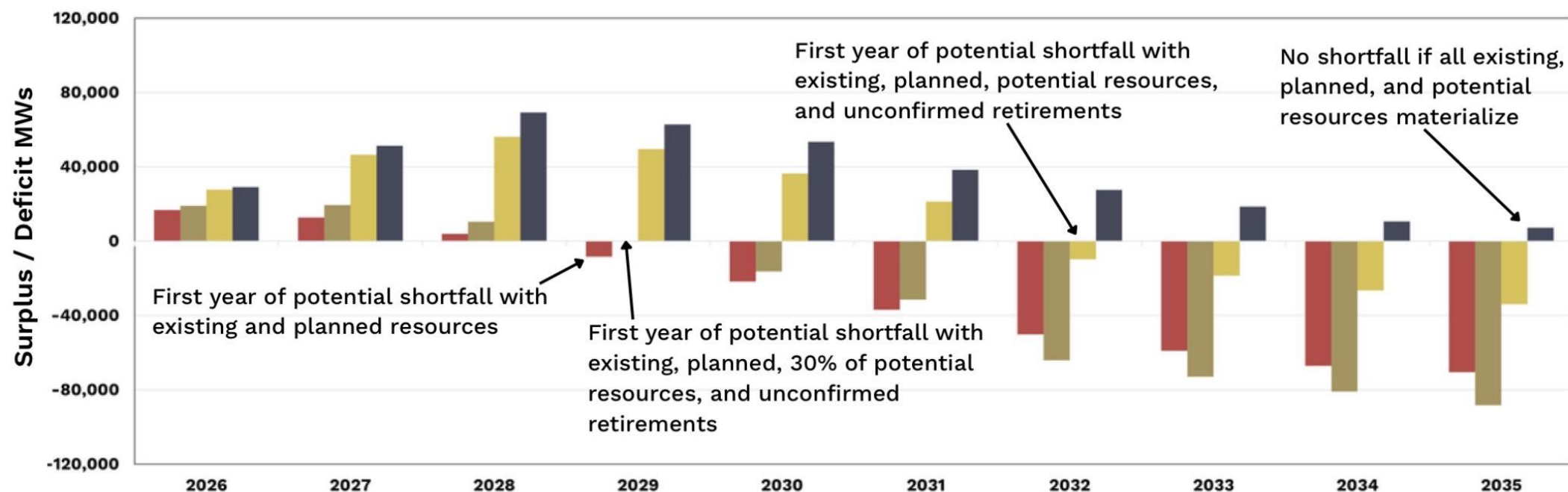
RESOURCE ADEQUACY: NERC 2025 LTRA



PJM CAPACITY VS RESERVE MARGIN LEVEL

ReliabilityFirst Regional Resource Adequacy Report

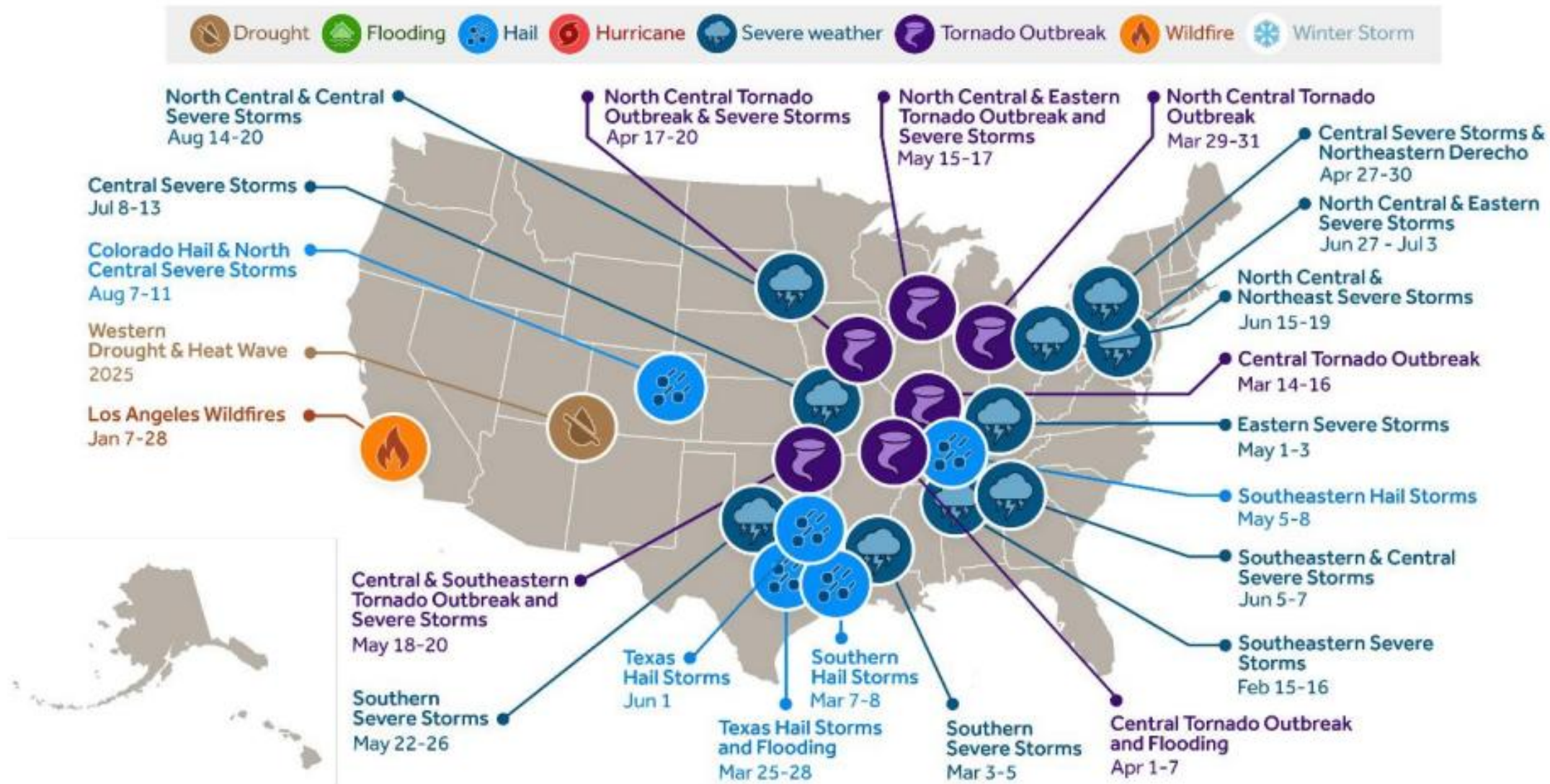
PJM Surplus/Deficit Resource Capacity vs. Reserve Margin Level



- Reserve Margins with Existing and Planned Resources
- Reserve Margins with Existing, Planned, 30% of Potential Resources, and Unconfirmed Retirements
- Reserve Margins with Existing, Planned, Potential Resources, and Unconfirmed Retirements
- Reserve Margins with Existing, Planned, and Potential Resources



GRID WEATHER EVENTS



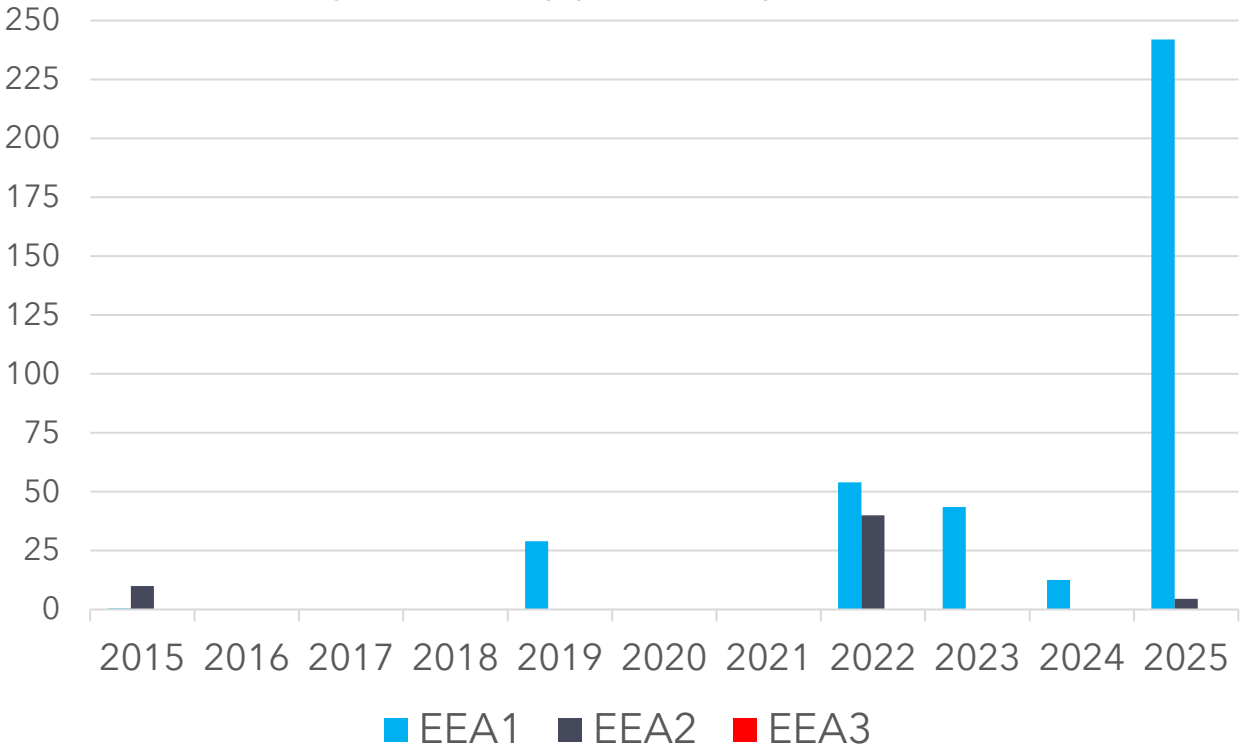
This map shows the approximate location for each of the 23 separate billion-dollar weather and climate disasters that impacted the United States from January-December of 2025.

CLIMATE CENTRAL

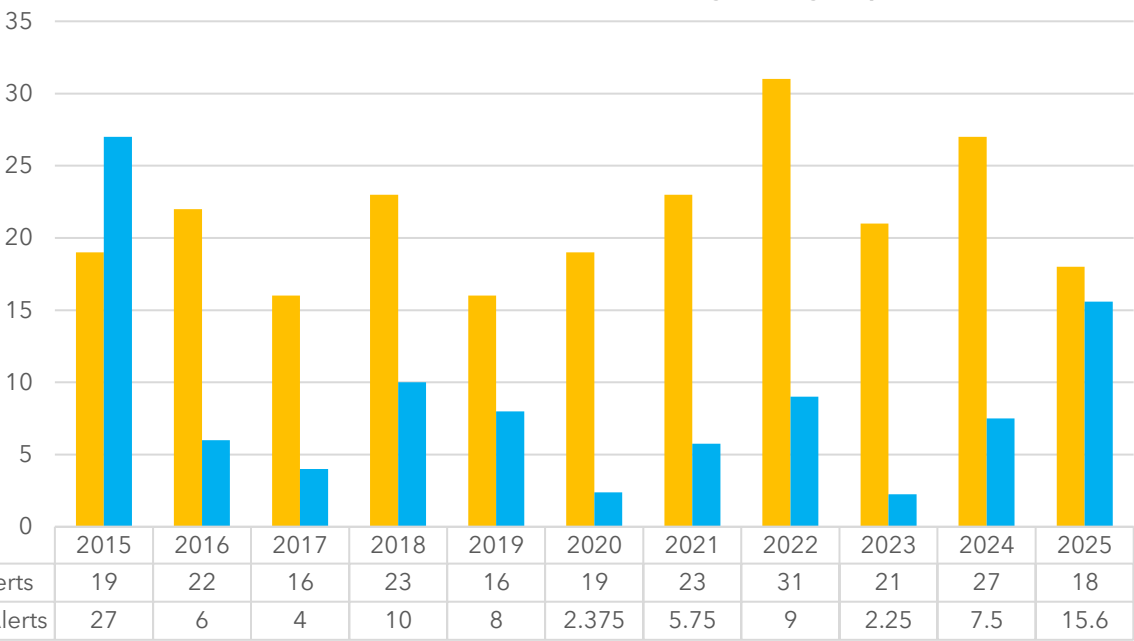
NERC 2026 State of Reliability Report

INCREASING USE OF EMERGENCY PROCEDURES

PJM EEA Level Alerts
by Hours Applicable per Year



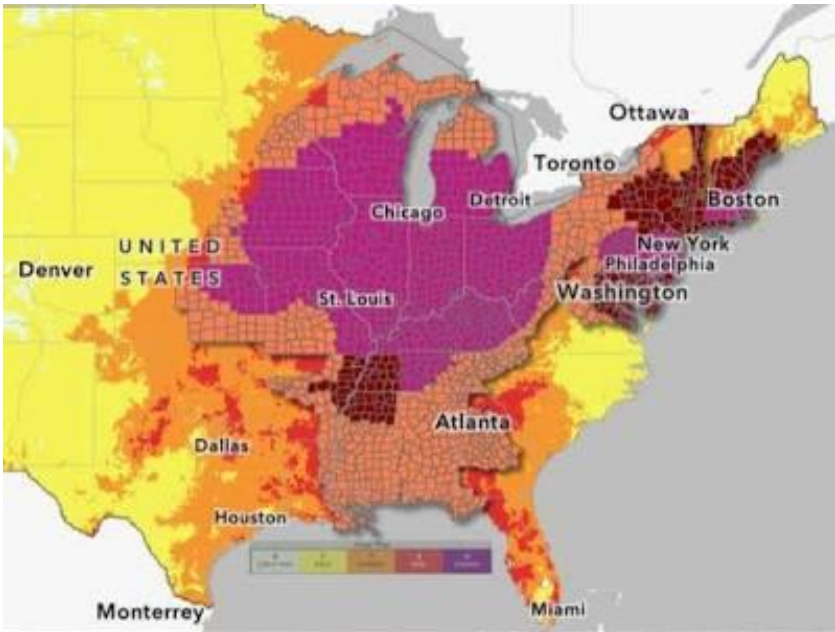
Cold/Hot Weather Alerts by Days per Year



*EEA2 issuances overlap with EEA1 issuances; rounded events time; excluded drills
See PJM all Emergency Procedures at <https://emergencyprocedures.pjm.com/ep/pages/dashboard.jsf>

THE JULY HEAT DOMES

PJM Emergency Log



Largest US Power Grid Issues Alerts as Heat Drives Near-Record Power Demand

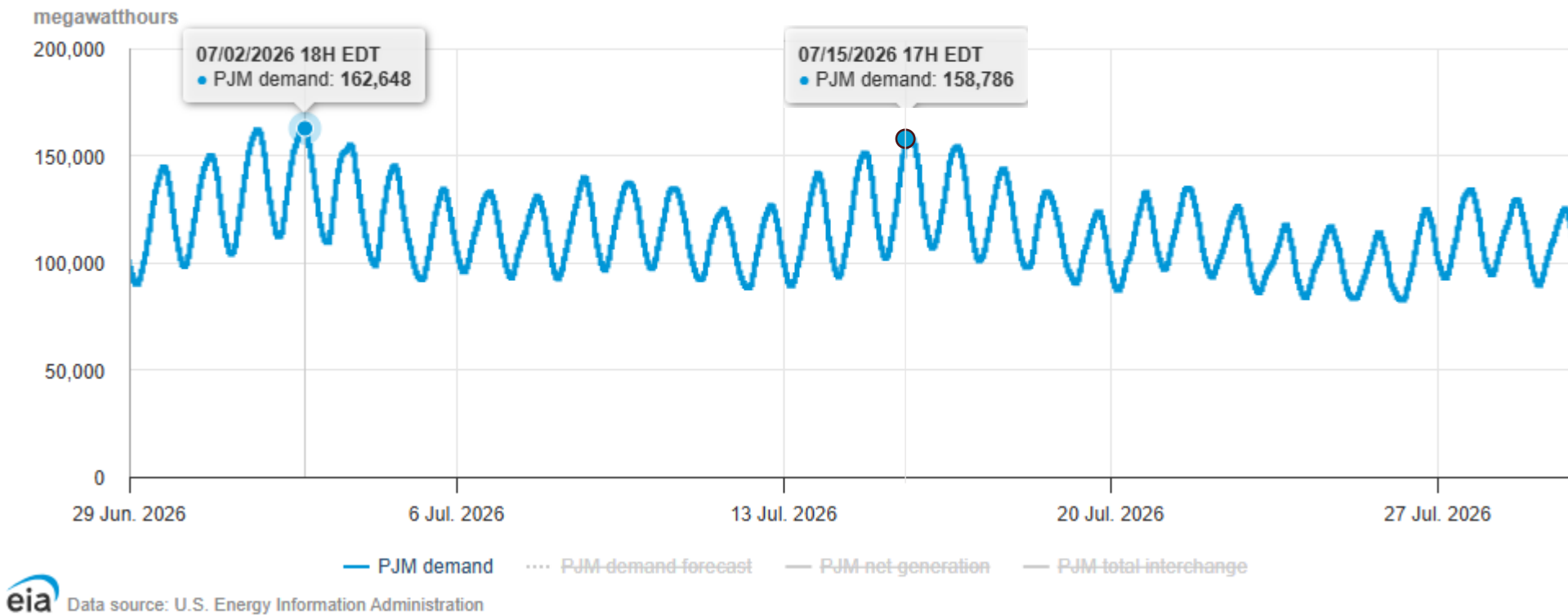
Screenshot via The Epoch Times/National Weather Service

Date	Alert Window	Duration	Level	Event Details
July 16, 2026	12:01 a.m. to 11:26 p.m.	23 hrs	● EEA 1	Maximum Generation Emergency/Load Management Alert
July 15, 2026	12:01 a.m. to 11:59 p.m.	24 hrs	● EEA 1	Maximum Generation Emergency/Load Management Alert
July 3, 2026	8:45 p.m. to 11:59 p.m.	3 hrs	● EEA 1	Emergency procedures were initiated to support reliability.
July 3, 2026	2:00 p.m. to 8:45 p.m.	7 hrs	● EEA 2	Emergency procedures were initiated to support reliability.
July 3, 2026	12:01 a.m. to 2:00 p.m.	14 hrs	● EEA 1	EEA 1 was declared in advance under PJM procedures.

*Unrestricted Peak Load: 168,158 MW
Instantaneous Peak Load: 162,713 MW, including Demand Response

PJM LOAD DURING HEAT DOME EVENTS

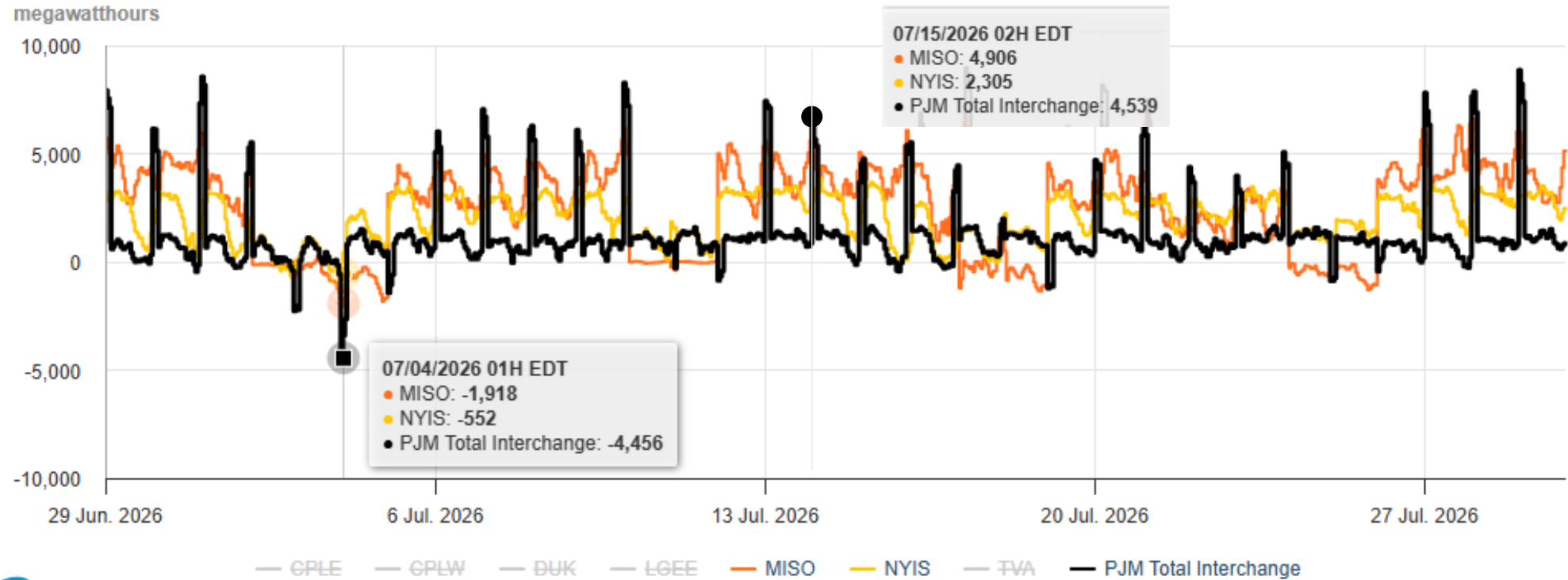
PJM Interconnection, LLC (PJM) electricity overview (demand, forecast demand, net generation, and total interchange)
6/29/2026 – 7/29/2026, Eastern Time



PJM recorded its highest peak load of over 162,000 MW on July 2nd.

IMPORTS/EXPORTS DURING HEAT DOME EVENT

PJM Interconnection, LLC (PJM) electricity interchange with neighboring balancing authorities 6/29/2026 – 7/29/2026, Eastern Time



Data source: U.S. Energy Information Administration

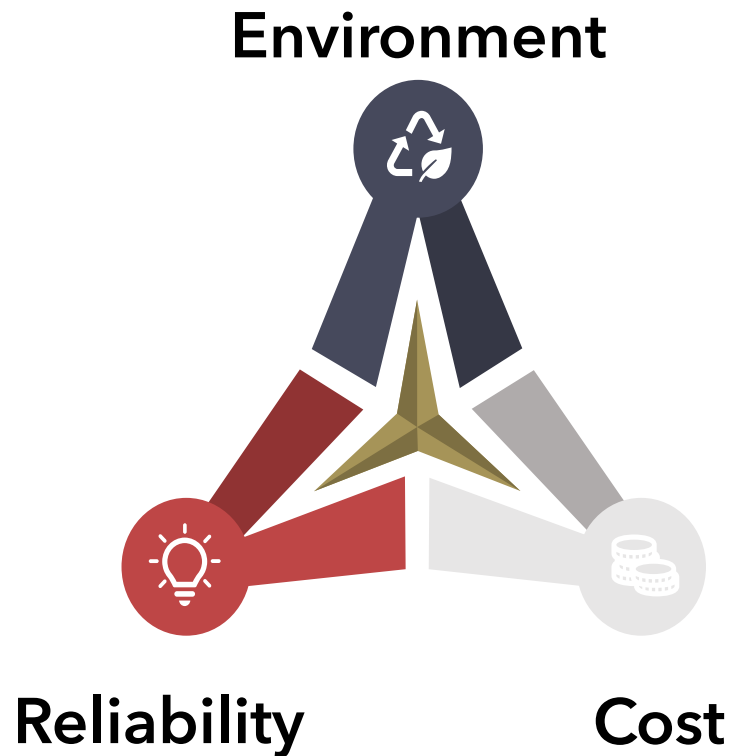
RESOURCE MIX

PJM Interconnection, LLC (PJM) electricity generation by energy source 6/29/2026 – 7/29/2026, Eastern Time



Data source: U.S. Energy Information Administration

DATA CENTER TRILEMMA CONSIDERATIONS



Follow NERC's Large Load
Action Plan

<https://www.nerc.com/initiatives/large-loads-action-plan>

Reliability

Size and Profile of
Load

Operational/Security
Concerns

Visibility of BTM
Generation

Location

Load Flexibility

Ride-Through and
Oscillation Events

Cost

Impact to Customers

Build Outs Needed

Supply Chain

Cost of Adjacent
Critical Infrastructure

Job Creation

Economic Benefits

Environment / Sustainability

BTM fuel source

Purchasing RECs

Land Usage

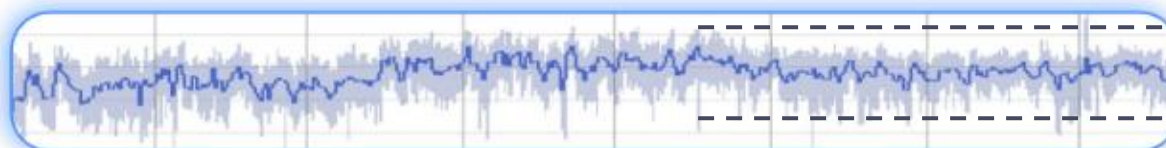
Water Usage

Carbon Footprint

Increased Power
Demand

DATA CENTER LOAD

Traditional (Non-AI) Workload



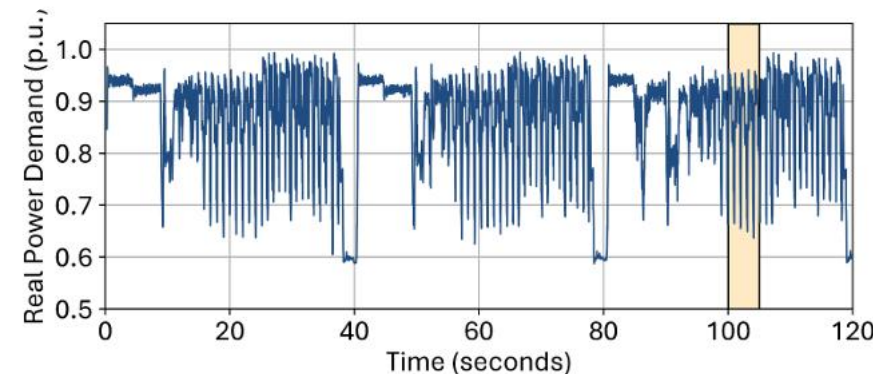
1.5 MW peak to trough in milliseconds

- Stable baseload profile
- High load factor, smoother ramps
- Easier for operations and forecasting

AI Workload



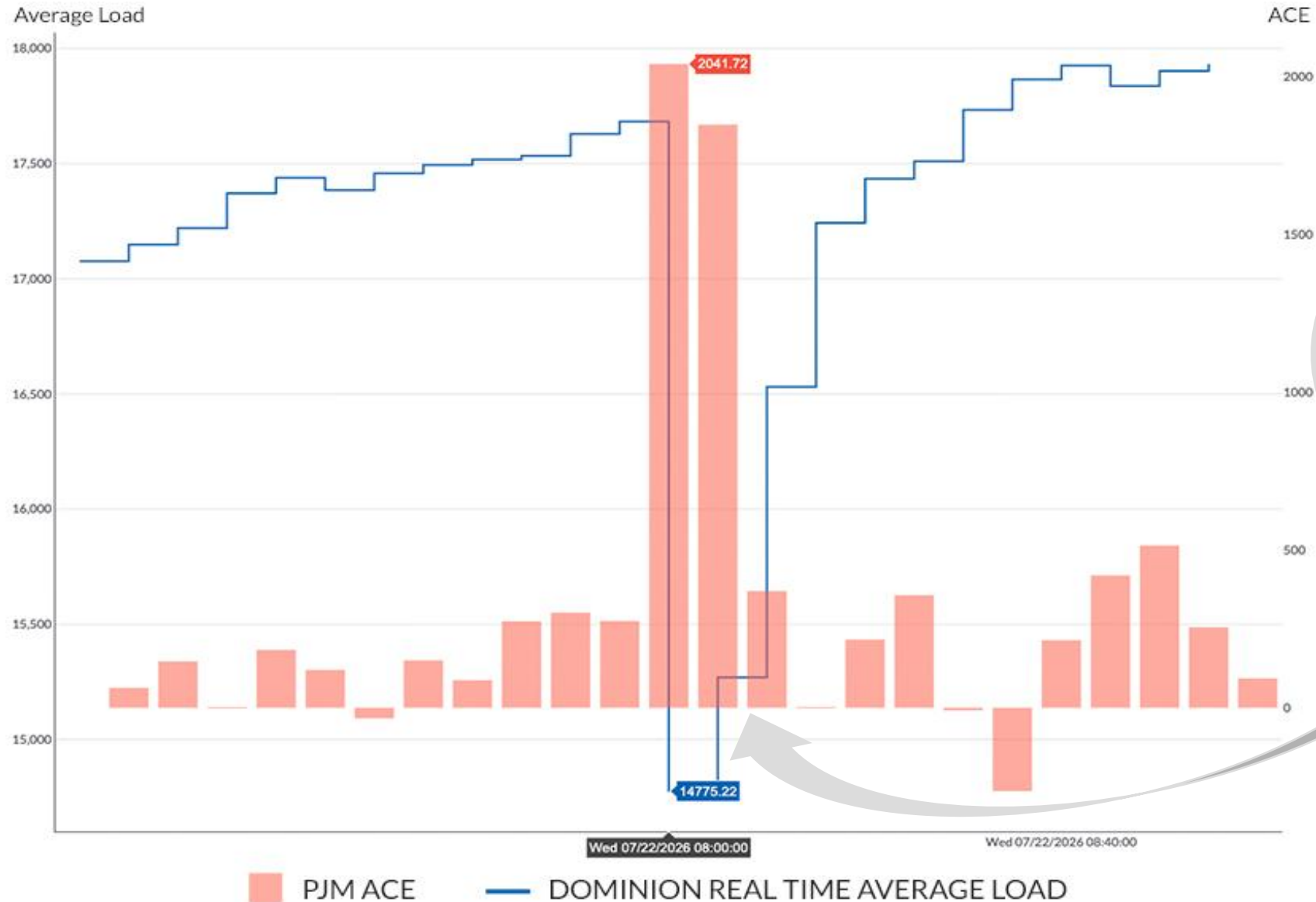
15 MW peak to trough in milliseconds



Source: [NERC Large Loads Task Force White Paper](#)

- Fast, deep cycling during training
- Millisecond-scale peak-to-trough changes
- Behaves like industrial power electronics load

DATA CENTER IMPACTS: DOMINION LOAD TRIP JULY 2026



PJM and Yes Energy data show that about **3 GW of load suddenly dropped off** the grid between 7:55 and 8 a.m., leading to a spike in the RTO's area control error.

Yes Energy & RTO Insider

NERC LARGE LOADS WORKING GROUP (LLWG)

Develop load models

Identify metering & protection changes

Assess impact on resource adequacy

Collect data to identify unique characteristics

Improve planning process for integrating Large Loads

Classification of different Large Loads

Identify processes & standards that do not fully address risk of emerging Large Loads

Whitepaper 1:
Characteristics and Risks of Emerging Large Loads

Whitepaper 2:
Assessment of Gaps in Existing Practices, Requirements, and Reliability Standards for Emerging Large Loads

Whitepaper 3:
Reliability Guideline Risk Mitigation for Emerging Large Loads

New Whitepaper:
Computational Loads Standard
Authorization Request Roadmap

FERC ORDERS ON LARGE LOADS

Six orders were issued in June 2026 directing RTOs & TOs to justify/reform rules on large loads

Protect Consumers

- Prevent cost-shifting with mandatory contracts
- Reduce infrastructure costs with smarter studies
- Boost efficiency with Grid Enhancing Technologies (GETs)

Enhance Transparency

- Provide transparency in transmission costs
- Improve load forecasting practices
- Increase disclosure of utility investments

Four Pillars
of FERC's
Response

Safeguard Reliability

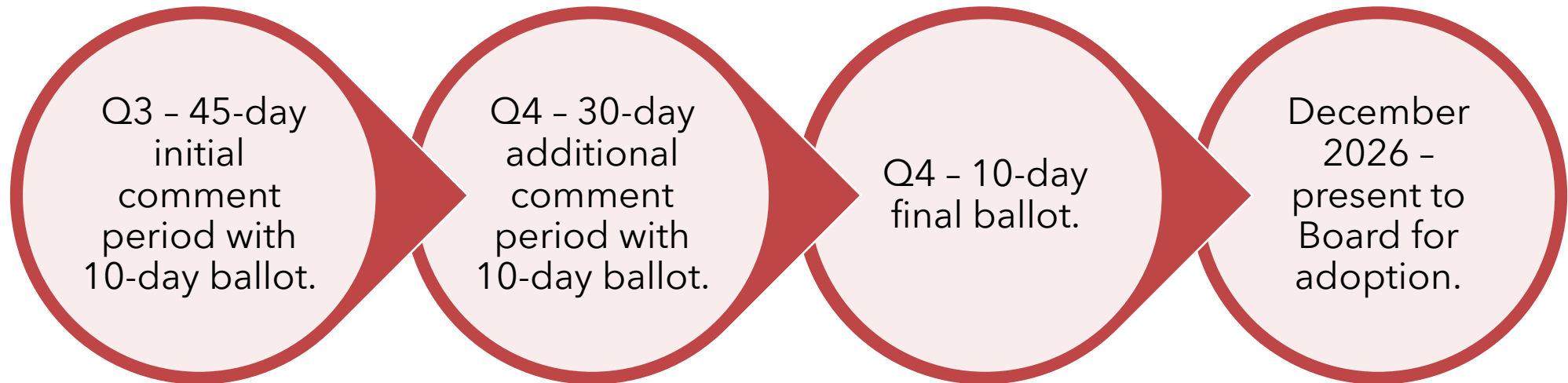
- Establish new large load impact studies
- Accelerate interconnection for system stability
- Continue NERC standards development process

Foster Innovation (Speed to Power Solutions)

- Accelerate co-located and proximity loads
- Leverage advanced load flexibility
- Complete studies faster (60 to 90 days)

NERC STANDARDS DEVELOPMENT: COMPUTATIONAL LOADS

- Project 2026-02 Computational Loads - Timeline 2026



- Key next steps:
 - Review responses to NERC Level 3 Alert
 - Proposed Reliability Standards to be released August 19, 2026

DATA CENTER POLICY IN OHIO

Official/Passed

AEP Ohio Data Center Tariff

- Approved in July 2025
- Applicable for new data centers larger than 25 MW
- Must pay 85% of the energy they expect to require every month, regardless of whether they use less
- Includes exit fees for if a project is cancelled
- One of the first data center specific tariffs

Data Center Sales Tax Exemption

- Include minimum capital investment and employee compensation
- Allows partial or full sales tax exemption
- The consideration of any new data center tax exemptions was paused in May 2026 while data center growth in the state is further studied

Proposed

- Creating Data Center Study Commission
- Restricting public financial incentives for data centers and/or ending the sales tax exemption
- Limiting the amount of data centers that can be constructed
- PUCO approval for very large data centers
- More transparency regarding energy and water use, as well as during the siting process
- Tech companies paying for infrastructure needed to serve data center energy demand

Notable Proposal:
HB 646

TAKEAWAYS AND CALLS TO ACTION

Familiar issues continue...

- Extreme weather risk
- Generation retirements
- Load growth / winter load growth increasing faster and increasingly uncertain
- Large load integration
- Natural gas interdependency

Some bright spots emerging...

- Retirement deferrals; expedited queue processes (MISO, PJM, SPP)
- Gas and Electric sectors "leaning in"
- NERC/FERC actions on energy assurance, IBRs, Large Loads
- Battery / synchronous condenser deployments helping (lessons learned from Iberian Blackout)

Continued focus required...

- Investment in critical infrastructure
- Large load interconnection requirements
- Retention of essential reliability services as well as energy supply
- Gas-Electric Coordination
- Technology (nuclear and LDES) development and deployment

RELIABILITY INSIGHTS

Focused technical documents on critical issues with potential reliability impacts



Reliability Insights

New Approaches Needed to Ensure System Adequacy
June 2025

Reliability Insights

NERC Reliability Assessments Evolve with Emerging Risks
October 2025

Reliability Insights

The Interconnected Gas and Electric Systems
March 2025

Reliability Insights

Supply Chain Security
June 2026

QUESTIONS & ANSWERS

