

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

2022 Long-Term Reliability Assessment

Mark Olson, Manager, Reliability Assessments
AAPCA Spring Meeting
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RELIABILITY | RESILIENCE | SECURITY



Mission: To efficiently and effectively reduce risks to the reliability and security of the Bulk Power System in North America

- NERC certified as the Electric Reliability Organization by the Federal Energy Regulatory Commission in 2006
- Jurisdiction focuses on the Bulk Power System
- Many programs executed through 6 regional entities with delegated authority across North America
- Develop and enforce mandatory Reliability Standards
- Assess current and future reliability – Reports, Event Analysis
- Operate the Electricity Information Sharing and Analysis Center (E-ISAC) to support security needs of the sector

Each year, we publish the most cited and credible report on Bulk Power System Reliability in North America

What?

We do this using industry forecasts and coordination with our Regional Entities and technical groups

How?

Everything we do helps ensure that the lights stay on today and in the future

Why?

Governance (Rules of Procedure):

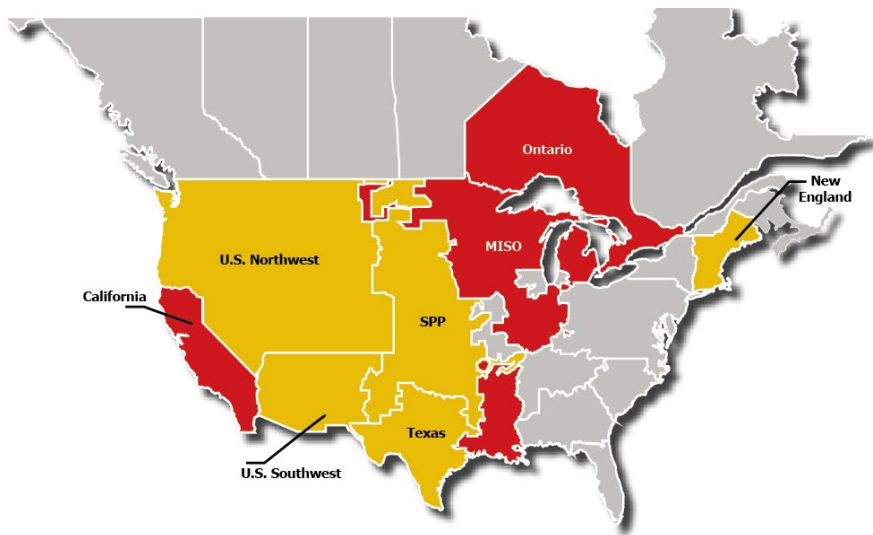
Independently assess and report on the overall reliability, adequacy, and associated reliability risks impacting the North American BPS.

- NERC's annual reliability assessments show increasing risk
- Grid and energy systems are undergoing unprecedented change...**Federal and state policies play a significant role**
- We believe that the energy transition that is occurring can work reliably but **the pace of change needs to be managed**



Report available at [NERC.com](https://www.nerc.com) [here](#)

- Findings cover five topics:
 - Energy Risk Assessment
 - Changing Resource Mix
 - Demand Trends
 - Transmission Trends
 - Emerging Risks



- **High Risk** – Shortfalls occurring in normal peak conditions
- **Elevated Risk** – Shortfalls occurring in extreme conditions

• Risk of insufficient future electricity supply:

- Energy and capacity risk assessment found areas face future risks in normal and extreme weather
- Additional unanticipated generator retirements can increase risks

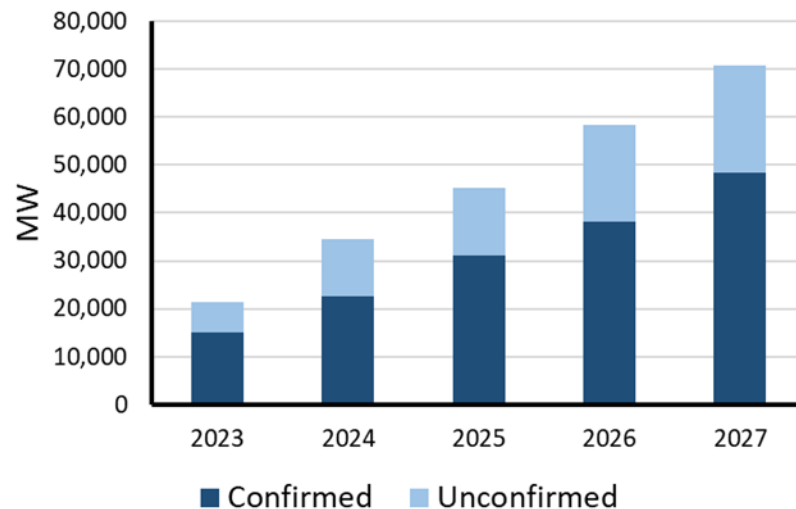
• Unresolved engineering and technical issues

- Behavior of new types of resources and how they are installed affect reliability and must be planned
- Natural gas system is increasingly important for electric reliability but interdependency issues exist

• Lagging transmission system development

- New resources (wind and solar) are frequently not sited in the locations where generators are retiring
- Siting and permitting is a challenge

- Over 88 GW of fossil-fired and nuclear generating capacity is confirmed for retirement during the assessment period
- Additional 22 GW could retire within the next five years and exacerbate capacity and energy shortfalls
- Managing the pace of generator retirements can help prevent energy risks and system reliability issues



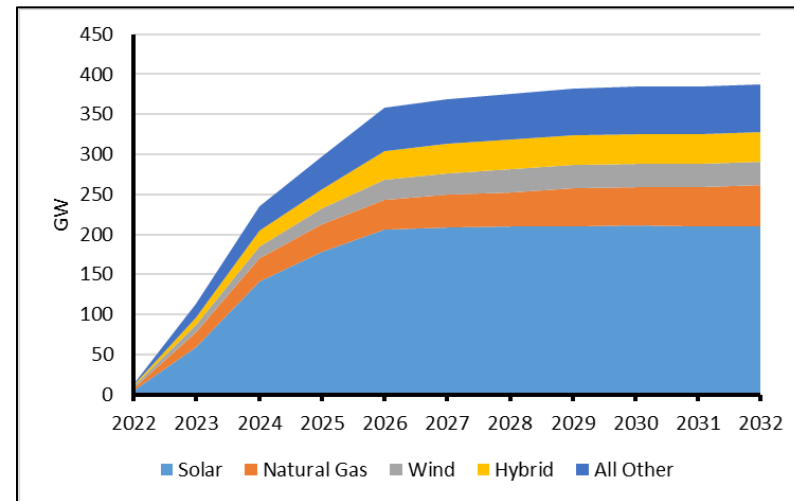
Capacity of Retiring Generation through 2027

- Wind, solar, and hybrid generation leads the continued energy transition as older thermal generators retire
- Implications:
 - Reliably integrating inverter-based resources (IBR) on the grid is paramount
 - Careful planning is needed to ensure the needs of the system are met: energy, capacity, and essential reliability services
 - Addressing vulnerabilities to natural gas delivery to generators is critical for electric grid reliability

Table 1: 2022 Capacity at Peak Demand

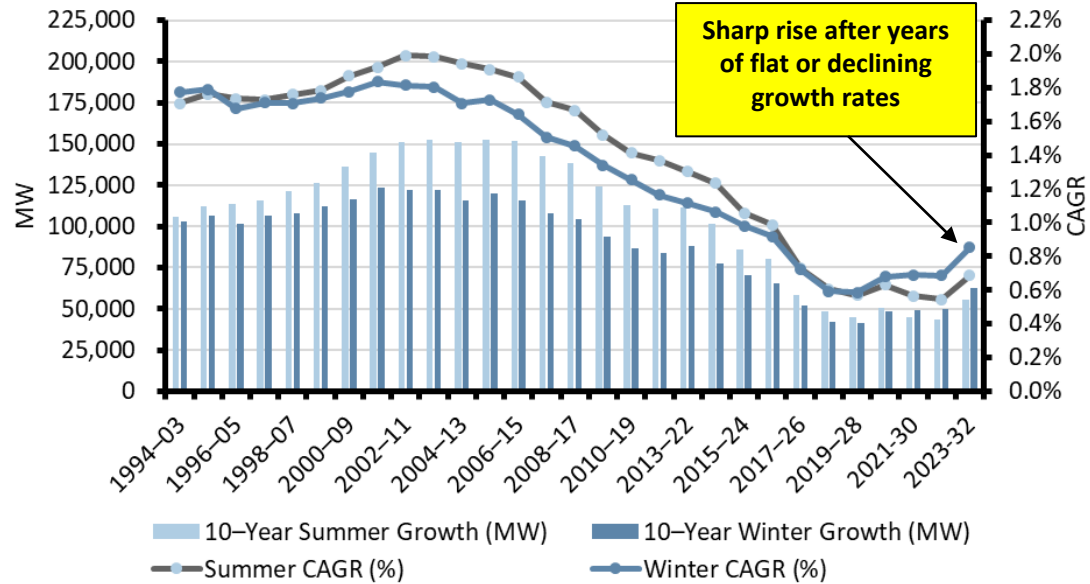
Type	Capacity (GW)	Change since 2021 (GW)
Natural Gas	477	+14
Coal	202	-18
Nuclear	106	-2
Solar and Wind	70	+19
All others	189	+2

Contributions at hour of peak demand. VER (solar, wind, and some hydro) typically count less than installed nameplate capacity.



Resource Capacity in Pipeline to Connect

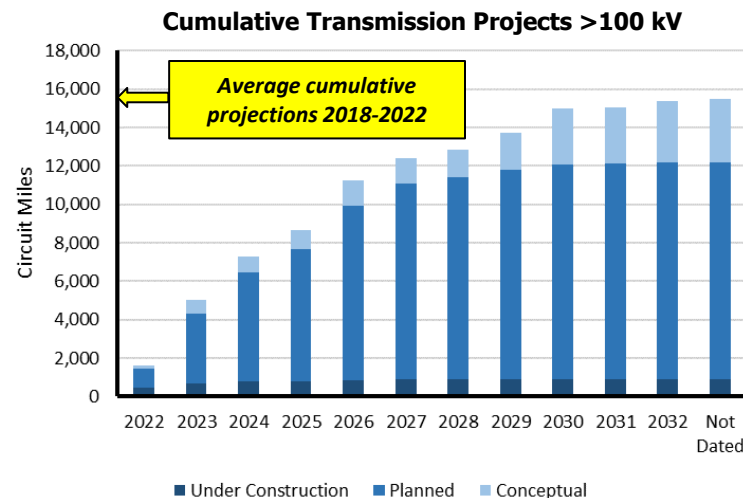
- 10-year Peak Demand growth showing largest increases in recent years
- Further increases from electrification and EV adoption are anticipated
- Areas must plan for all seasons: Peak demand is rising in winter and may match or exceed traditional summer peak



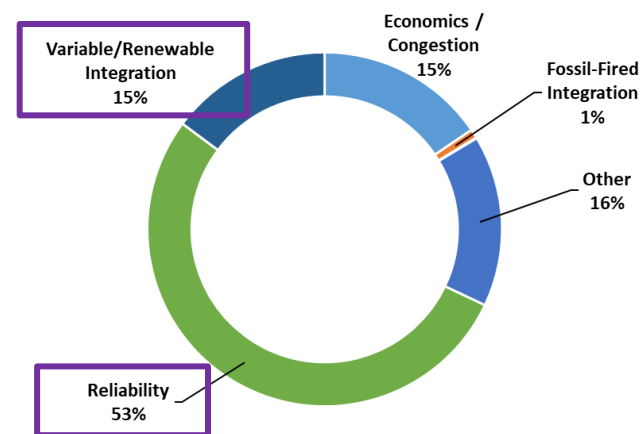
10-year Summer and Winter Peak Demand Growth

Largest 10-year Winter Peak Demand Growth		Largest 10-year Summer Peak Demand Growth	
Assessment Area	Demand Change	Assessment Area	Demand Change
NPCC-New York	2.36%	WECC-SRSG	1.69%
WECC-SRSG	2.06%	NPCC-Ontario	1.27%
NPCC-New England	1.95%	WECC-CAMX	1.19%
NPCC-Ontario	1.32%	MRO-SaskPower	1.05%
Texas RE-ERCOT	1.30%	NPCC-Maritimes	1.03%

- Little change in transmission miles projections in past five years
- Relatively few projects support resource integration
 - Some indication that the trend is changing
 - Miles planned or under construction for renewable integration increased from 1,589 miles to 2,376 miles since 2021 LTRA



Transmission Miles in Planning or Construction through 2032			
Area	Miles	Area	Miles
WECC WPP	3,439	SERC SE	629
NPCC New York	1,635	WECC SRSG	581
PJM	983	NPCC Ontario	570
WECC CAMX	902	NPCC New England	506
WECC BC	775	All other areas	<500 mi each



- Anticipating EV adoption and impacts of energy transition programs on future demand, load shapes, and energy needs is a growing focus for planners and operators
- Cryptocurrency mining is raising policy, market, operational, and planning issues in areas experiencing growth
- Supply chain issues threaten completion timelines for generation and transmission projects in development

Objectives of the *LTRA*'s specific recommendations to policymakers and industry:

- **Manage the pace of generator retirements to ensure energy and essential reliability services needs are met**
- Address performance and integration issues with solar and wind
- Expand resource adequacy evaluations beyond reserve margins to include energy risks for all hours and seasons
- Mitigate risks from interdependent natural gas infrastructure
- Promote use of extreme weather scenarios in resource planning
- Increase focus on operating with more distribution resources
- Consider the impact of electrification on future electricity demand and infrastructure

NERC commends the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy (DOE) on their memorandum of understanding (MOU) to foster interagency cooperation and consultation to support electric reliability. ... We believe that the energy transition that is occurring can work reliably but the pace of change needs to be managed and we have stressed the critical need to evaluate the impacts of these policies on reliability. ... NERC is encouraged by the MOU and looks forward to engaging with DOE, the EPA and others in this important effort.

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Questions and Answers

Contact

Mark Olson

Manager, Reliability Assessments

Mark.olson@nerc.net

The ERO Enterprise

