

# 2021 Long-Term Reliability Assessment

The LTRA identifies reliability trends, emerging issues, and potential risks to the bulk power system over a ten-year horizon.

## Resource Adequacy and Energy Risks

Anticipated reserves fall below Reference Margin Levels and energy risks exist in normal peak demand conditions during one or more years:

### MISO

The potential retirement of more than 13 GW of capacity between 2021 and 2024 presents risk. Resource additions must increase beyond current projections to avoid a capacity shortfall of more than 560 MW if these retirements occur.

### California

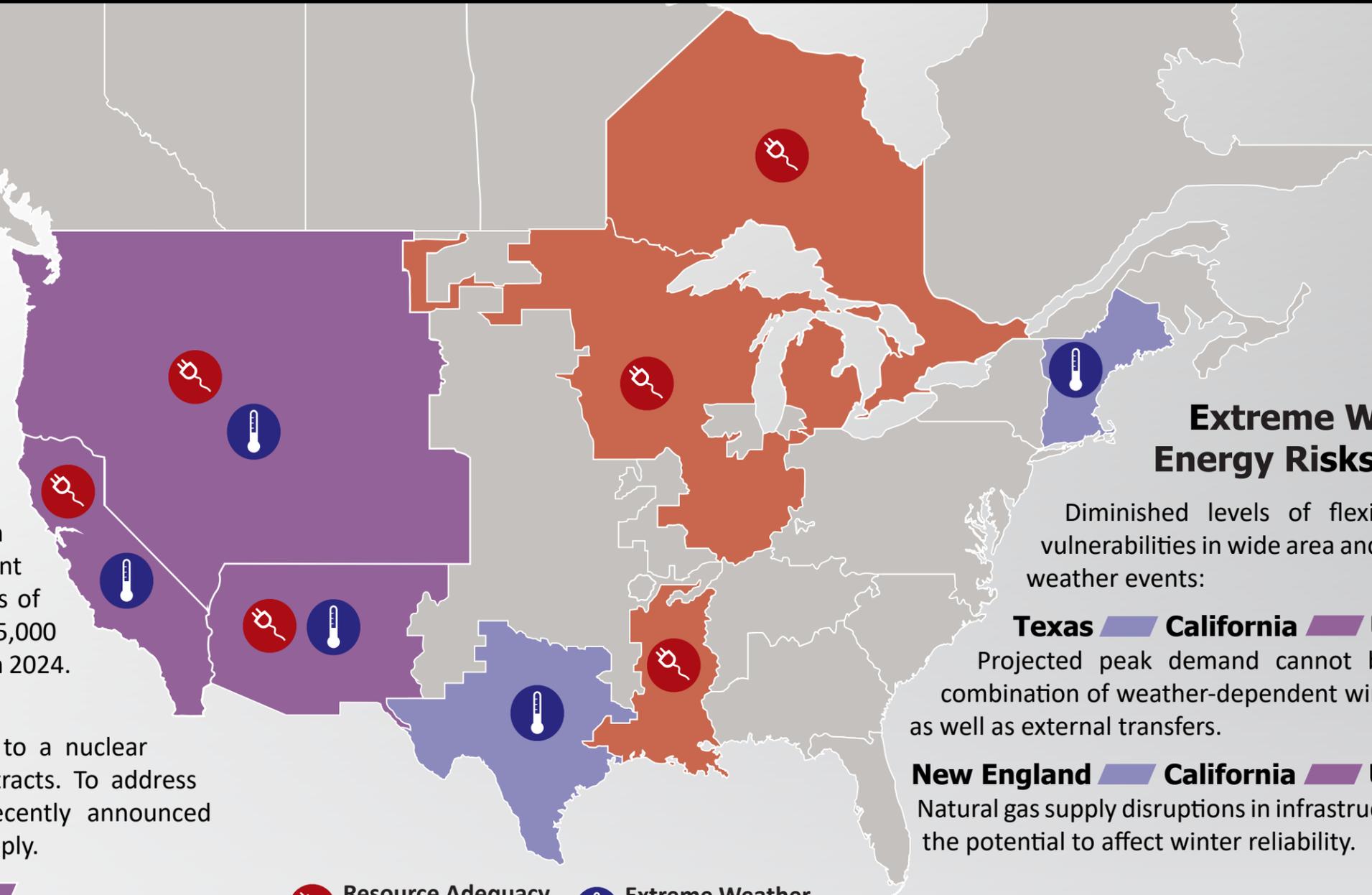
A capacity shortfall of 3,200 MW beginning in 2026 is projected without additional replacement resources. Energy analysis shows up to 10 hours of load loss beginning in 2022 and as much as 75,000 MWh of unserved energy in extreme conditions in 2024.

### Ontario

A projected shortfall in 2026 is primarily due to a nuclear station shutdown and expiring generation contracts. To address the anticipated shortfall, the IESO expects recently announced procurement mechanisms to bolster capacity supply.

### U.S. Northwest U.S. Southwest

A more variable demand and resource profile is increasing energy risks. Energy analysis indicates 23 load-loss hours in the Northwest in 2022. The Southwest faces 17 load-loss hours in 2024.



## Extreme Weather Energy Risks

Diminished levels of flexible generation create vulnerabilities in wide area and long-duration extreme weather events:

**Texas California U.S. Northwest**  
Projected peak demand cannot be met without some combination of weather-dependent wind and solar generation as well as external transfers.

**New England California U.S. Southwest**  
Natural gas supply disruptions in infrastructure-limited areas have the potential to affect winter reliability.

Resource Adequacy and Energy Risks Extreme Weather Energy Risks

## 2031 Snapshot over the Next 10 Years

- **Transmission:** 14,000 miles in development (>100 kV), consistent with 10-year averages. 40% are below 50 miles in length.
- **Wind:** New projects total 360 GW of nameplate capacity over the next 10 years.
  - Areas with the Most Capacity in Planning: MISO (6 GW), New England (1.7 GW), PJM (2.7 GW), SPP (4.6 GW), ERCOT (12.7 GW)
- **Solar:** Distributed solar resources are expected to exceed 60,000 MW by 2031.
  - Areas with the Most Bulk-Power-System-Connected Solar Capacity in Planning: Texas (25 GW), PJM (9 GW), MISO (11 GW)