2022 Long-Term Reliability Assessment

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Long-Term Reliability Assessment

- 10-year assessment of resource capacity and energy risks
- Uses industry’s demand and generation forecasts and transmission projections
- Coordination and Review with Regions and Stakeholders
- Includes emerging issues which can impact future reliability
Capacity and Energy Risk Assessment

California
- New resources and delayed retirements are alleviating near-term capacity shortage
- Energy risks persist from resource and demand variability

MISO
- Generation retirements are projected to outpace new resource additions
- 1,300 MW capacity shortfall next summer grows over the 10-year period

Ontario
- Planned retirements and nuclear work result in a projected capacity shortfall

U.S. West
- Unserved energy projections are increasing in summer months

New England
- Fuel risk in extended cold weather

 ERCOT
- Reliability continues to be at risk in severe winter weather from generator and fuel issues
- Steps taken since 2021 help mitigate impacts

SPP
- Energy shortfalls likely during low-wind and high demand periods
Wind, solar, and hybrid generation leads the continued energy transition as older thermal resources retire.

Implications:

- Careful attention to the pace of generator retirements is needed to prevent energy risks and loss of essential reliability services.
- Addressing vulnerabilities to natural gas delivery to generators is critical for electric grid reliability.
- Reliably integrating inverter-based resources (IBR) on the grid is paramount.
• 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
• Robust planning processes for managing the pace of generator retirements are needed to prevent energy risks and system reliability issues
• Preparing the grid to operate with distributed energy resources (DER) is a growing priority

• Cumulative solar PV DER expected to reach over 80,000 MW by the end of the 10-year assessment period (up 25% since 2021)
10-year Peak Demand growth showing largest increases in recent years

Planning for increases in demand as electrification and EV adoption gain momentum is an area for added focus

Dual-peaking or changing from summer to winter peaking anticipated in some parts of the U.S. Southeast and Northeast
• Little change in transmission miles projections in past five years
  ▪ An indicator of the significant time and challenges needed to build transmission

• Few projects support resource integration, but trend is changing
  ▪ Miles planned or under construction for renewable integration increased from 1,589 miles to 2,376 miles since 2021 LTRA

<table>
<thead>
<tr>
<th>Transmission Miles in Planning or Construction through 2032</th>
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<tr>
<td>Area</td>
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<tr>
<td>WECC WPP</td>
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<td>NPCC New York</td>
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<td>WECC CAMX</td>
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Emerging Issues

- 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.
- Changes to U.S. communications regulations governing access to the 6 GHz band is raising concerns of harmful interference on circuits used by BPS owners and operators for grid monitoring and control.
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
- Promote use of extreme weather scenarios in resource planning
- Expand resource adequacy evaluations beyond reserve margins to include energy risks for all hours and seasons
- Mitigate risks from interdependent natural gas infrastructure
- Address performance and integration issues with solar and wind
- Increase focus on operating with more distribution resources
- Consider the impact of electrification on future electricity demand and infrastructure
Questions and Answers