MISO’s Response to the Reliability Imperative

NASUCA Mid-Year Meeting
Indianapolis, IN

June 13, 2022
➢ Transformational trends in the electric power sector create a reliability imperative. MISO has a four-prong response and roadmap

➢ Recent resource adequacy assessments indicate that the MISO North/Central sub-region is on the front edge of insufficient capacity

➢ Market reforms help mitigate risk. Coordinated action is needed to ensure ample resources as the fleet transitions and to manage the transition
Challenges resulting from the changing resource portfolio and increasing extreme weather risk have created an imperative for broad changes.

**MISO Response to the Reliability Imperative**

**FLEET CHANGE**

<table>
<thead>
<tr>
<th>Year</th>
<th>Renewables</th>
<th>Other</th>
<th>Nuclear</th>
<th>Gas</th>
<th>Coal</th>
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<tbody>
<tr>
<td>2021</td>
<td>16%</td>
<td>29%</td>
<td>3%</td>
<td>3%</td>
<td>39%</td>
</tr>
<tr>
<td>2030 Future 1</td>
<td>35%</td>
<td>8%</td>
<td>10%</td>
<td>5%</td>
<td>20%</td>
</tr>
<tr>
<td>2030 Future 3</td>
<td>3%</td>
<td>44%</td>
<td>7%</td>
<td>5%</td>
<td>39%</td>
</tr>
</tbody>
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**MISO INSIGHTS**

- **MISO Forward**
  - Renewable Integration Impact Assessment (RIIA)
  - The February (2021) Arctic Event
- **Resource Availability and Need (RAN)**
- **Markets of the Future**
- **Electrification Insights**

**RELIABILITY IMPERATIVE**

- Market Redefinition
- Long Range Transmission Planning
- Operations of the Future
- Market System Enhancement

See Appendix for more details

List is not representative of all efforts

MISO is actively pursuing multiple workstreams to ensure on-going reliability and value creation.
The Reliability Imperative is the collection of work urgently needed across MISO’s markets, planning, and operations to reliably enable Member plans in the face of those growing risks.

- **MARKET SYSTEM ENHANCEMENTS (MSE)**
  Transforms MISO’s legacy platform into a flexible, upgradeable and secure system that can evolve for years to come; they will also integrate advanced technologies to process increasingly complex information.

- **MARKET REDEFINITION**
  Aims to ensure that resources with needed capabilities and attributes will be available during the highest risk periods across the year.

- **LONG RANGE TRANSMISSION PLANNING (LRTP)**
  Assesses the region’s future transmission needs holistically, in concert with utility/state plans for new generation resources; it will also consider potential cost allocation changes.

- **OPERATIONS OF THE FUTURE**
  Focuses on the skills, processes and technologies needed to ensure MISO Operations can effectively manage the grid into the future under increased complexity.

Click here to find out more about MISO’s Reliability Imperative.
Capacity deficit in the recent Planning Resource Auction points to accelerating fleet change and increases reliability risk.

North/Central Region Zonal Resource Credits (MW)

- 101,249 REQUIREMENT (PRMR)
- 1,230 SHORTFALL
- 96,791 OFFERS

- 1,900 IMPORTS FROM SOUTH
- 1,325 NORTH/CENTRAL EXTERNAL RESOURCES

PRMR = Planning Reserve Margin Requirement
While total installed capacity has steadily trended up, accredited capacity is moving in the opposite direction due to the capabilities of the resource types selected.

MISO Planning Resource Auction (PRA) results
We collectively need to be prudent in our actions to ensure sufficient resources and flexibility during the fleet transition.

**States**
- Factor regional consideration into state resource adequacy, resource attribute, and market construct requirements
- Inform the broader policy and statutory discussion at the state level

**Members**
- Collaborate with MISO and States on timely resource adequacy, market enhancements and regional transmission
- Share resource plans with MISO to enable accurate regional view

**MISO**
- Enhance transparency of resource evolution and regional outlook
- Improve Resource Adequacy construct (implement filings pending at FERC and develop additional reforms)
- Visibility into and reviewing impacts of resource retirements
- Inform the broader policy discussion with federal policymakers and agencies