



The Transitioning Grid and the Changing Complexion of Resource Adequacy

Louisiana Public Service
Commission

November 17th, 2022

Executive Summary



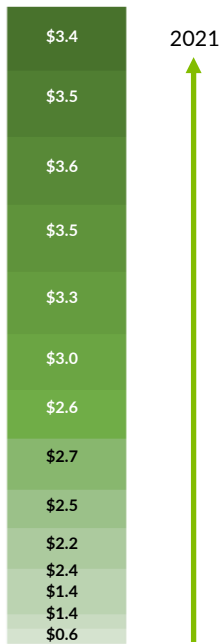
- MISO Zone 9 is tight and forecasted to be short soon given the economic growth and anticipated unit retirements in the region.
- Current price signals do not; 1) appropriately compensate excess capacity paid for by retail customers 2) send appropriate scarcity price signals and 3) incentivize longer term capacity/reliability planning.
- Excessive reliance on the current market design and insufficient resource planning (Free Riders)
- MISO, OMS, and the States are moving to improve the price signal construct.
- A state local requirement would complement the price signal reform and ensure capacity/reliability planning is taking place.

Since 2007, MISO has documented over \$36 billion in benefits to the region

Cumulative Benefits

(\$ billions)

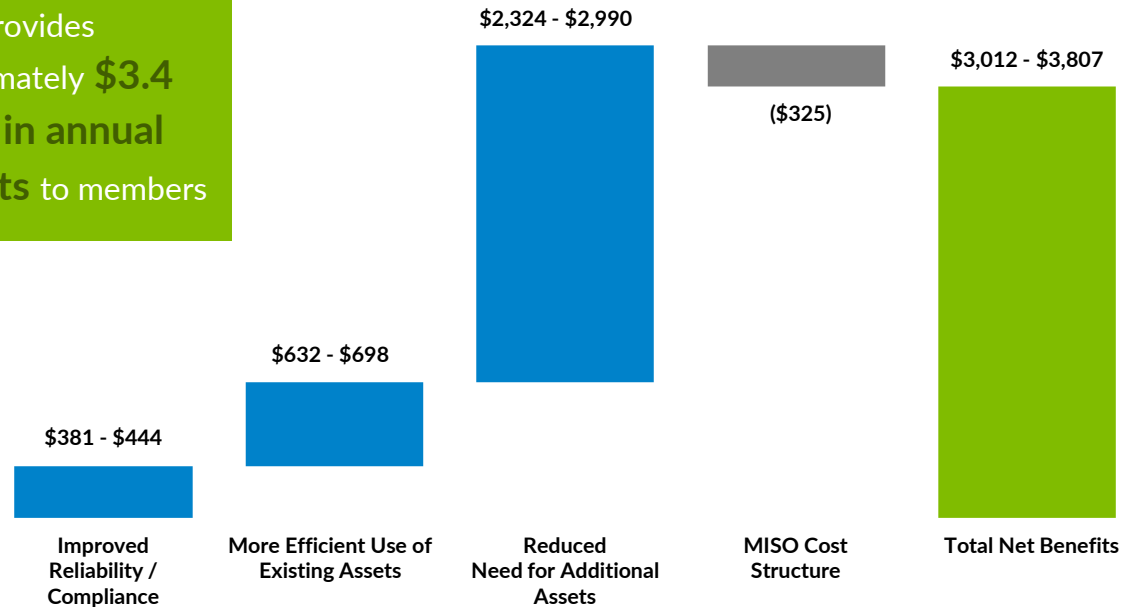
\$36



QUANTITATIVE BENEFITS

MISO provides approximately **\$3.4 billion** in annual benefits to members

2021 Benefit by Value Driver (\$ millions)



MISO South 2021 Value Proposition

2021 Benefit by Value Driver (\$ millions)



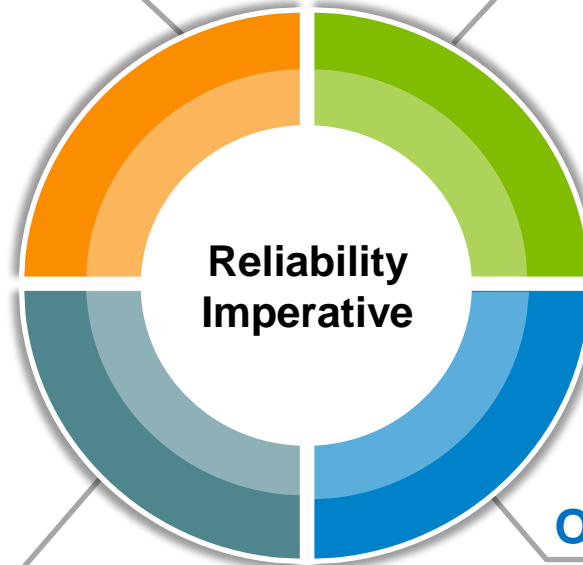
MISO's Reliability Imperative defines the changes necessary to reliably manage the changing resource portfolio and system risks

Market Redefinition

Aims to ensure that resources with needed capabilities and attributes will be available in the highest risk periods across the year

Long Range Transmission Planning (LRTP)

Assesses future transmission needs holistically, reflecting utility/state plans for new generation; will also consider potential cost-allocation changes



Market System Enhancements (MSE)

Transforms MISO's legacy platform into a flexible, upgradeable, and secure system that can evolve for years to come; will also integrate advanced technologies to process increasingly complex information

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

The region's energy landscape is evolving and will continue to evolve toward a more complex, less predictable future

Past

- Primarily controllable resources
- Ample reserve margins
- Predictable resource outages
- Relatively predictable weather
- Focus on providing energy in *the worst peak load hour* during the summer

Present

- Transitioning resource mix
- Tightening reserve margins
- Less predictable resource outages or unavailability
- Growing uncertainty in weather conditions
- Greater inter-dependence between utilities, states, and RTOs
- Focus on providing energy on *the worst day in each season*

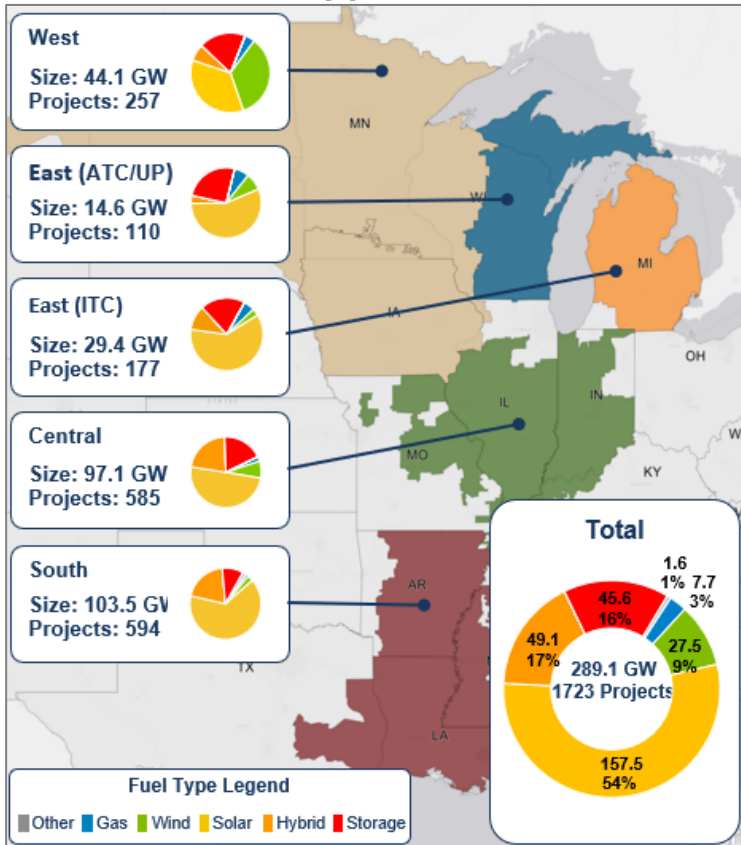
Future

- Primarily weather-dependent resources
- Risk-adjusted reserve margin requirements
- Less predictable resource outages or unavailability
- Less predictable weather
- Increasing scarcity of essential reliability attributes
- Increasing electric load
- Increasing importance of accurate load and renewable forecasting
- Focus on providing energy for *the worst week in each season*

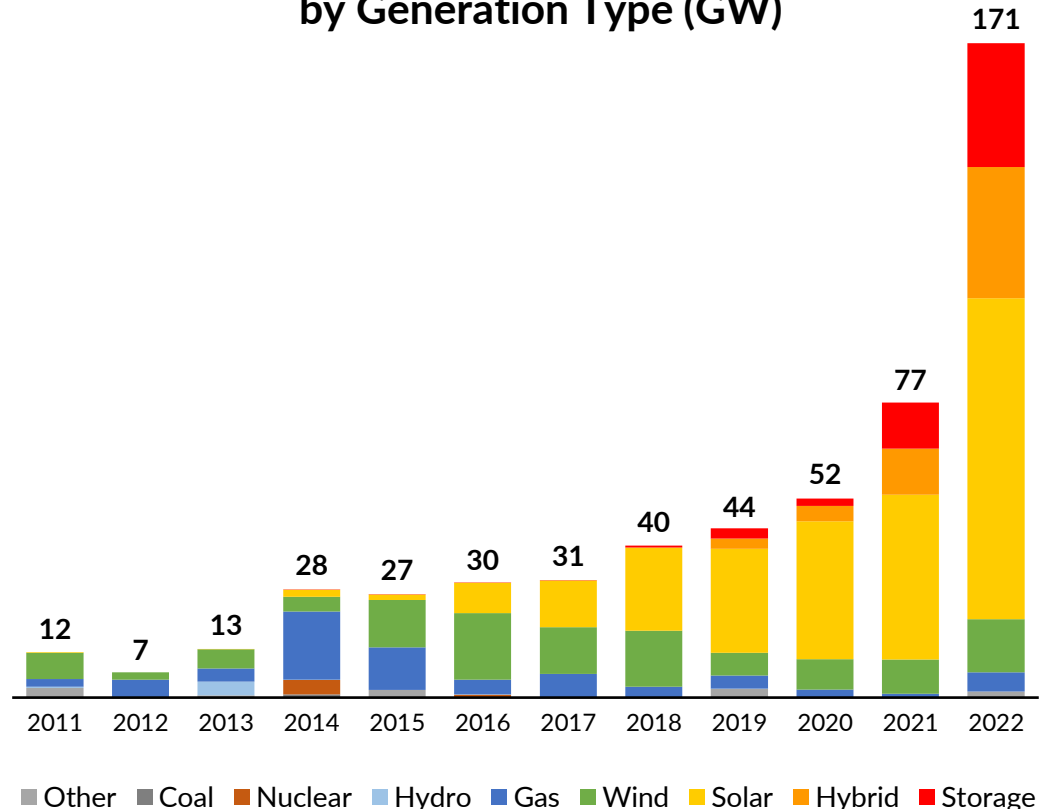
Policy drivers – such as EPA regulations; Environmental, Social, and Governance criteria; State Energy Policy; and the Inflation Reduction Act – are accelerating the fleet transition and associated risks

The interconnection queue indicates few resources with controllable attributes will be added, with most being battery-based resources of limited (4-hour) duration

MISO Active Queue plus 2022 Applications*



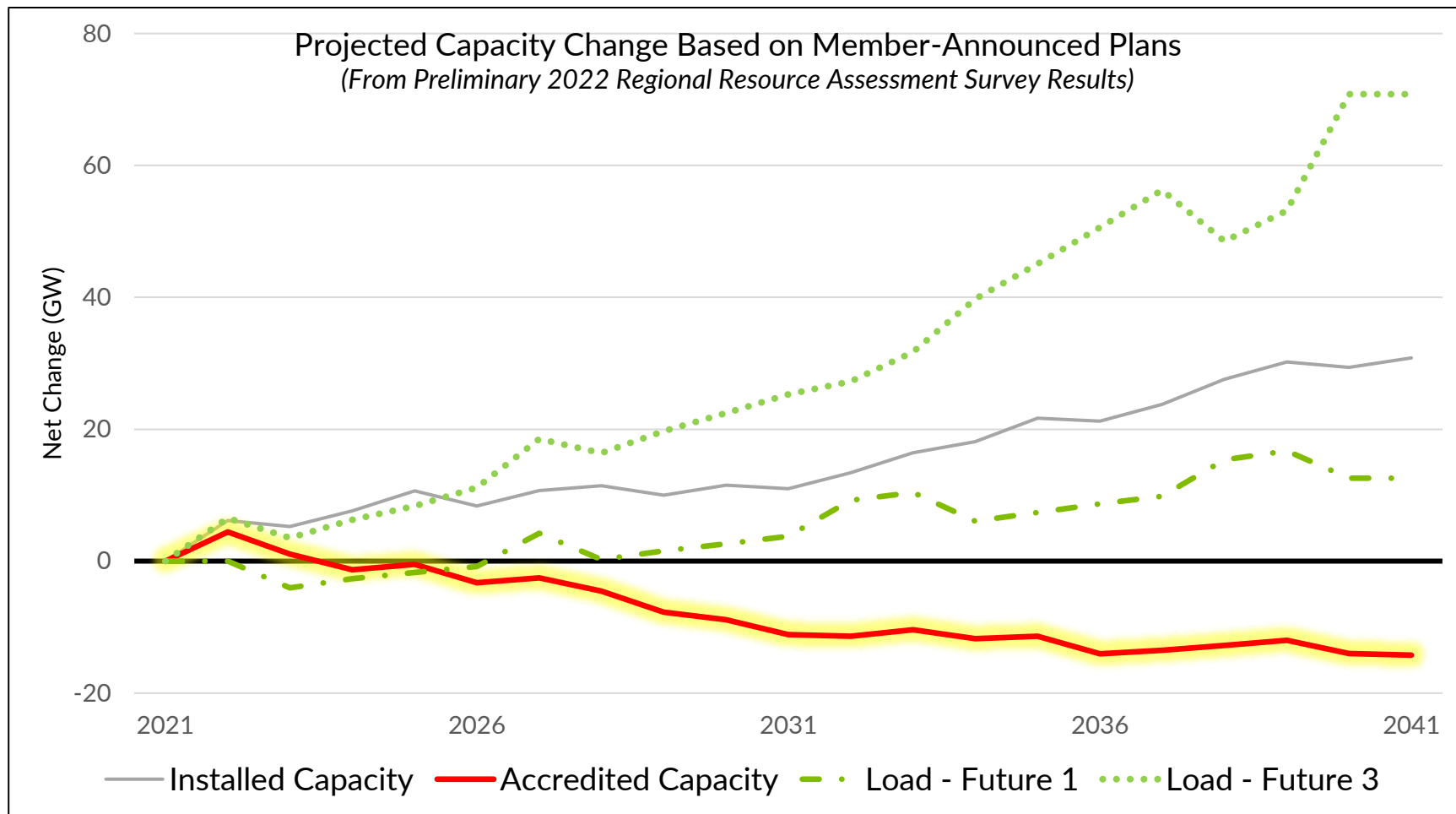
MISO Queue Applications* by Generation Type (GW)



9/13/2022

*Not all project applications will enter the active queue. Historically, 10% to 30% have been withdrawn/removed during the application review phase.

A survey of member plans indicates accredited capacity will continue to decline, combined with increasing intermittent resources and demand

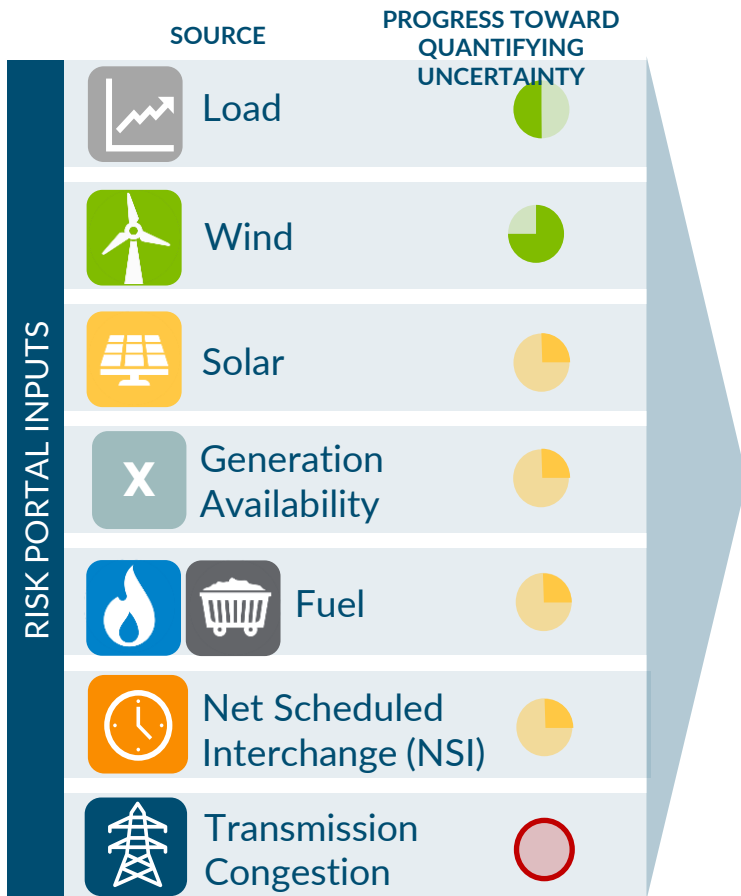


*Future projections calculated as change from Future 1 2022 load assumption

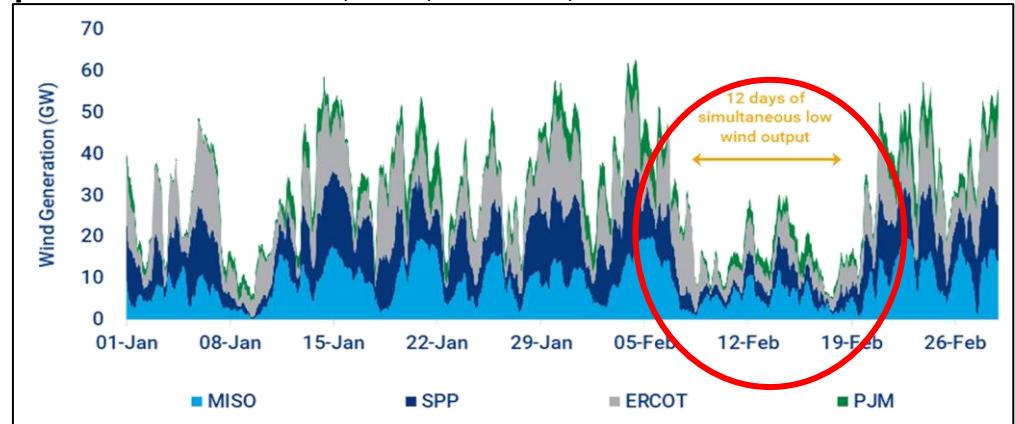
Estimated accredited capacity: 16.6% for wind; 35% for solar, 87.5% for battery, 90% for coal, 90% for gas, and 95% for nuclear

Variability risks must be considered to reliably evaluate and operate the system

PROBABILISTIC FORECASTS AND RISK ASSESSMENT

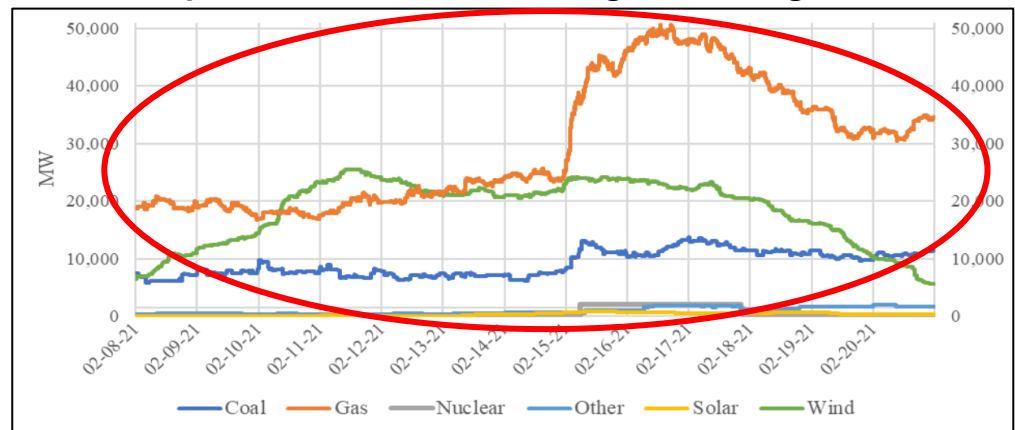


During Winter Storm Uri, wind output was low for a 12-day period across MISO, SPP, ERCOT, and PJM...



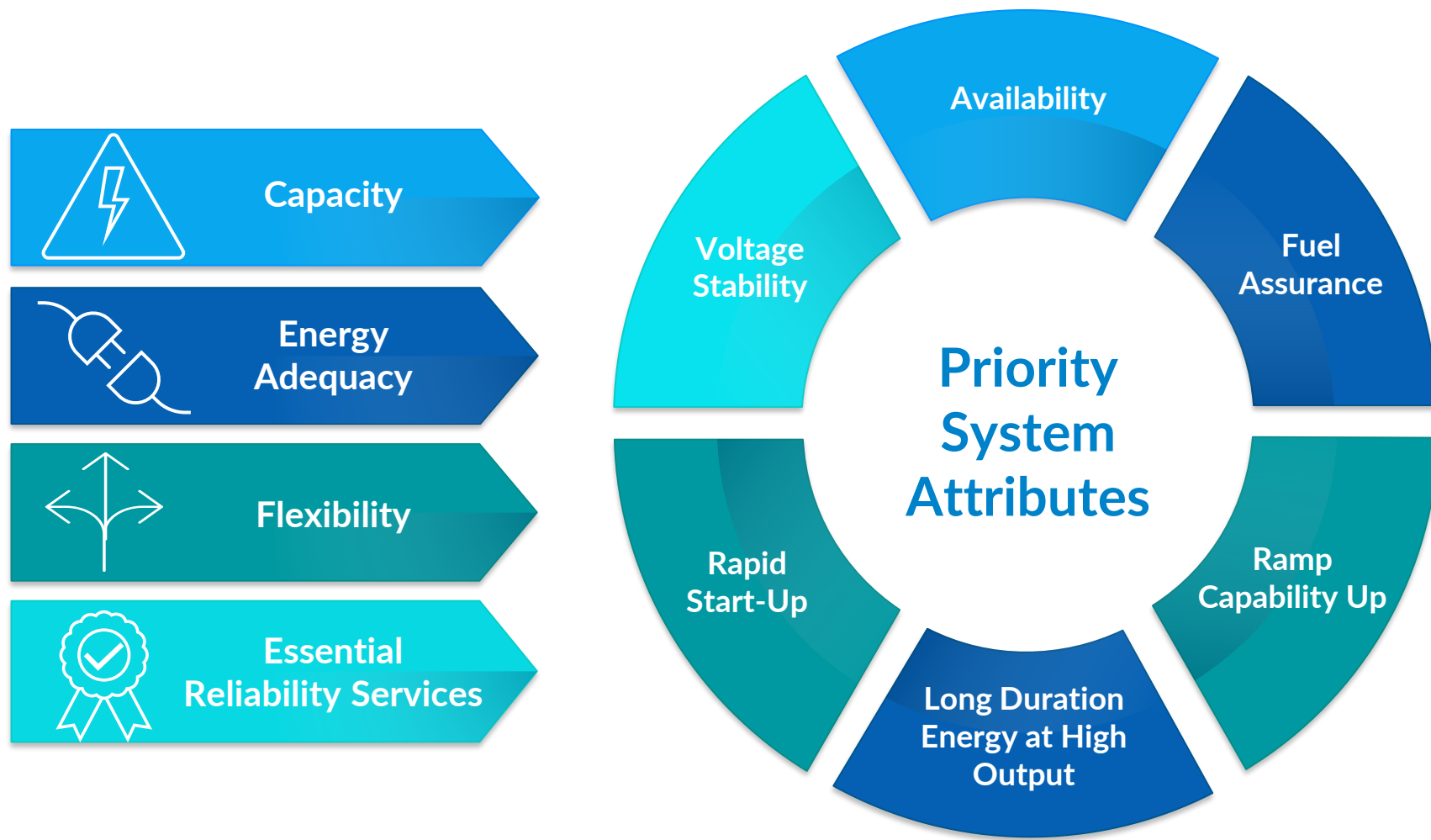
Source: Wood Mackenzie

...concurrently, all resource types in MISO South, SPP, and ERCOT experienced increased outages, totaling 455.7 GW.



Source: FERC Report on The February 2021 Cold Weather Outages in Texas and the South Central United States

Maintaining reliability with the changing resource portfolio and evolving risks also increases the importance of ensuring adequate attributes



FERC recently approved MISO's resource adequacy filing to better align resource requirements with system risks

Seasonal Resource Adequacy Construct

- Improves alignment of resource adequacy requirements with periods of increased risk on the MISO system

Improved Resource Capacity Accreditation

- Improves estimation and confidence of a resource's expected availability during future times of need in a season
- Incentivizes owners to maximize resource availability during high-risk hours

Updated planned outage thresholds

- Ensures that a resource is available for the season to which it commits

Louisiana (within LRZ9) has the tightest supply/demand balance in MISO South...

- The 2022 PRA resulted in only 1 GW of capacity beyond resource adequacy requirements, or 5% of total requirements
 - Due to Capacity Import Limits and to avoid CONE, LRZ9 had to clear at least 90% of its resources within the zone over the past three years of PRA results.
 - The zone has traditionally been an importer of competitive capacity from neighboring states (0.9 GW or ~4% of total requirements)
- Projections for the future have indicated continued excess capacity, depending on assumptions about new resource additions (per the OMS-MISO Survey)
- However, these projections DO NOT account for other risk factors such as load growth and early thermal retirements (e.g., EPA regulations)

Unless actions are taken to address risks, the state could experience capacity shortfalls, resulting in maximum tariff-allowed capacity prices (i.e., Cost of New Entry)

Resource Availability Risk

Seasonal Risk	Potential increased tightness in MISO's new seasonal construct (e.g., winter, spring seasons) due to lower historical resource availability
Restricted Availability	Some resource at "emergency only" status, qualifying as capacity resources but with restrictions

Retirements and New Additions

Resource Retirements	<ul style="list-style-type: none">• EPA regulations may impact 7 GW of resources (retire, retrofit, or run restricted)• Recent contracting changes may spur retirement reviews of additional resources
New Resources in the Queue	<ul style="list-style-type: none">• Recent interconnection applications are sizable (20+ GW) however are comprised of all solar and storage• Reduced accreditation and reliability attributes (e.g., less availability, less controllability, lacking long duration output)• Only a small fraction of queue resources are built

Priorities must include local generation and/or increased transmission

Though FERC rejected MISO's proposed Minimum Capacity Obligation (MCO), MISO has filed for rehearing

MCO: Require a minimum of 50% capacity to be secured for each Load Serving Entity, prior to the Planning Resources Auction

Purpose:

- 1) Support MISO reliability with the changing risk profile and lower excess reserve margins
- 2) Reflect that all Load Serving Entities are appropriately planning

MISO basis for rehearing:*

- 1) The MCO appropriately addresses the immediate need for resource adequacy in the MISO region
- 2) The MCO proposal adequately addresses market power concerns

MISO continues working on reforms to align fleet capability with system needs

Recently Approved by FERC

Resource Adequacy Construct

- Moves from annual to seasonal model, improves accreditation, and updates planned outage thresholds

Ongoing Activities

Improved Resource Accreditation

- Renewable and Load Modify Resources the focus in 2022

Resource Adequacy Construct

- Potential improvements to the Planning Resource Auction, including reevaluation of a reliability-based demand curve

Pricing

- Continued refinement of scarcity price reforms
- Improved modeling to achieve more efficient market outcomes and price signals

Resource Attributes

- Evaluating approaches to value resource attributes critical to reliably operating the evolving portfolio