

MISO Resource Adequacy Overview

Michigan Senate Energy & Technology Committee Meeting

April 27, 2016



MISO is an independent, non-profit organization in 15 U.S. States and one Canadian province



MISO by-the-numbers

High Voltage Transmission	66,000 miles
Installed Generation	180,000 MW
Installed Generation	1,600 Units
Peak System Demand	127,000 MW

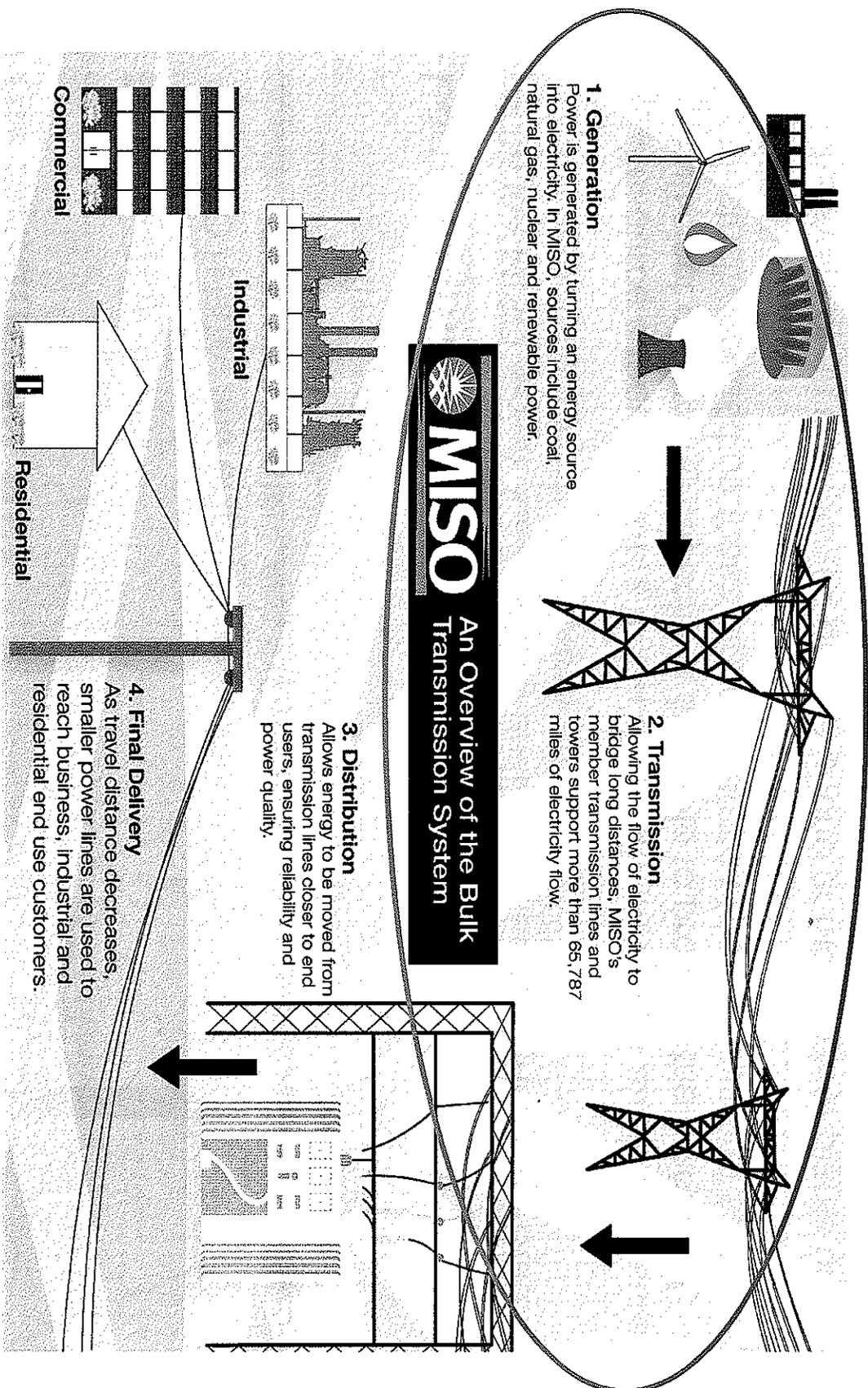
Mission

Drive value creation through efficient
reliability / market operations, planning
and innovation

or restated

Enable the reliable delivery of least
cost electricity to end-use consumers.

MISO doesn't build or own generation or transmission – we manage flows on the transmission system by directing generator usage



1. Generation
Power is generated by turning an energy source into electricity. In MISO, sources include coal, natural gas, nuclear and renewable power.

2. Transmission
Allowing the flow of electricity to bridge long distances, MISO's member transmission lines and towers support more than 65,787 miles of electricity flow.

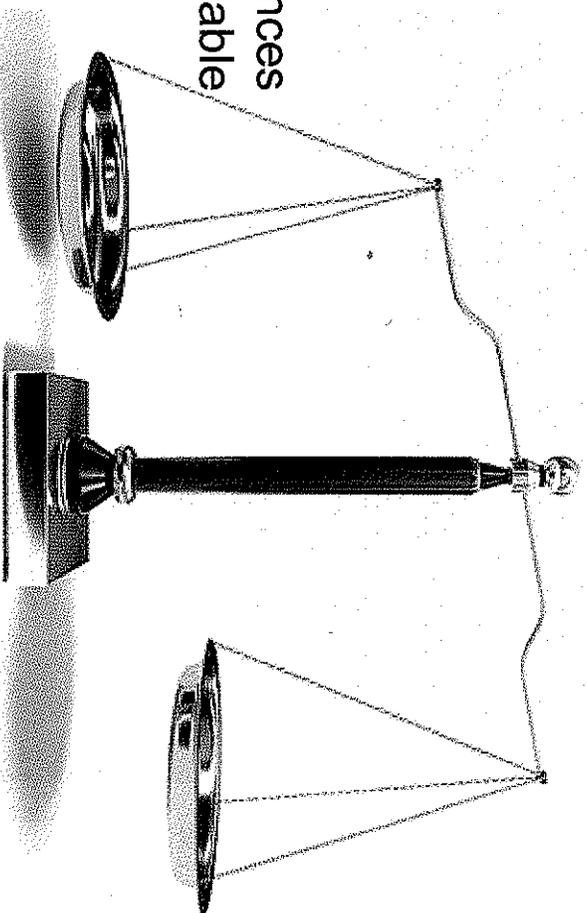
3. Distribution
Allows energy to be moved from transmission lines closer to end users, ensuring reliability and power quality.

4. Final Delivery
As travel distance decreases, smaller power lines are used to reach business, industrial and residential end use customers.

MISO
An Overview of the Bulk
Transmission System

The Balancing Act

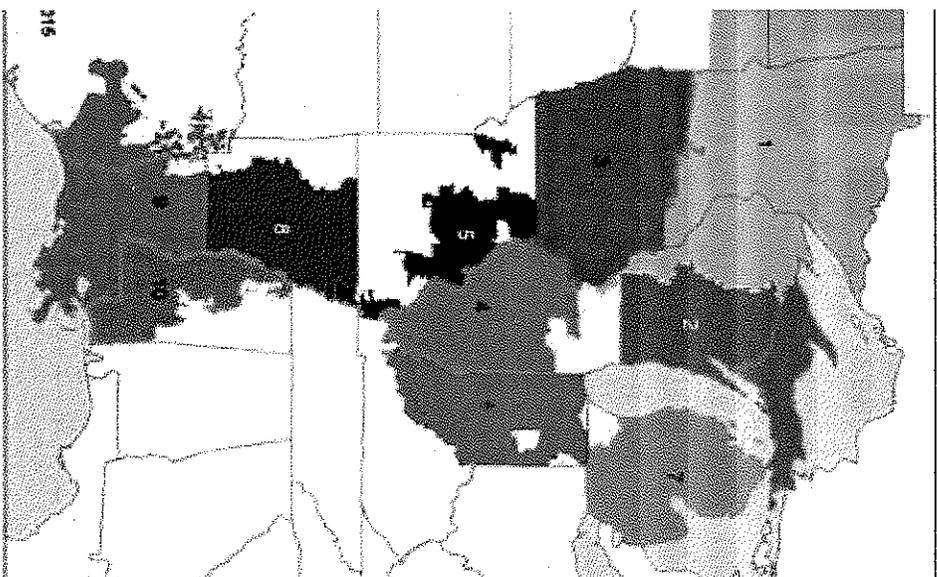
- **Day-to-day**
 - MISO reliably and efficiently balances the needs of customers with available supply through centralized, competitive energy markets
- **Longer term**



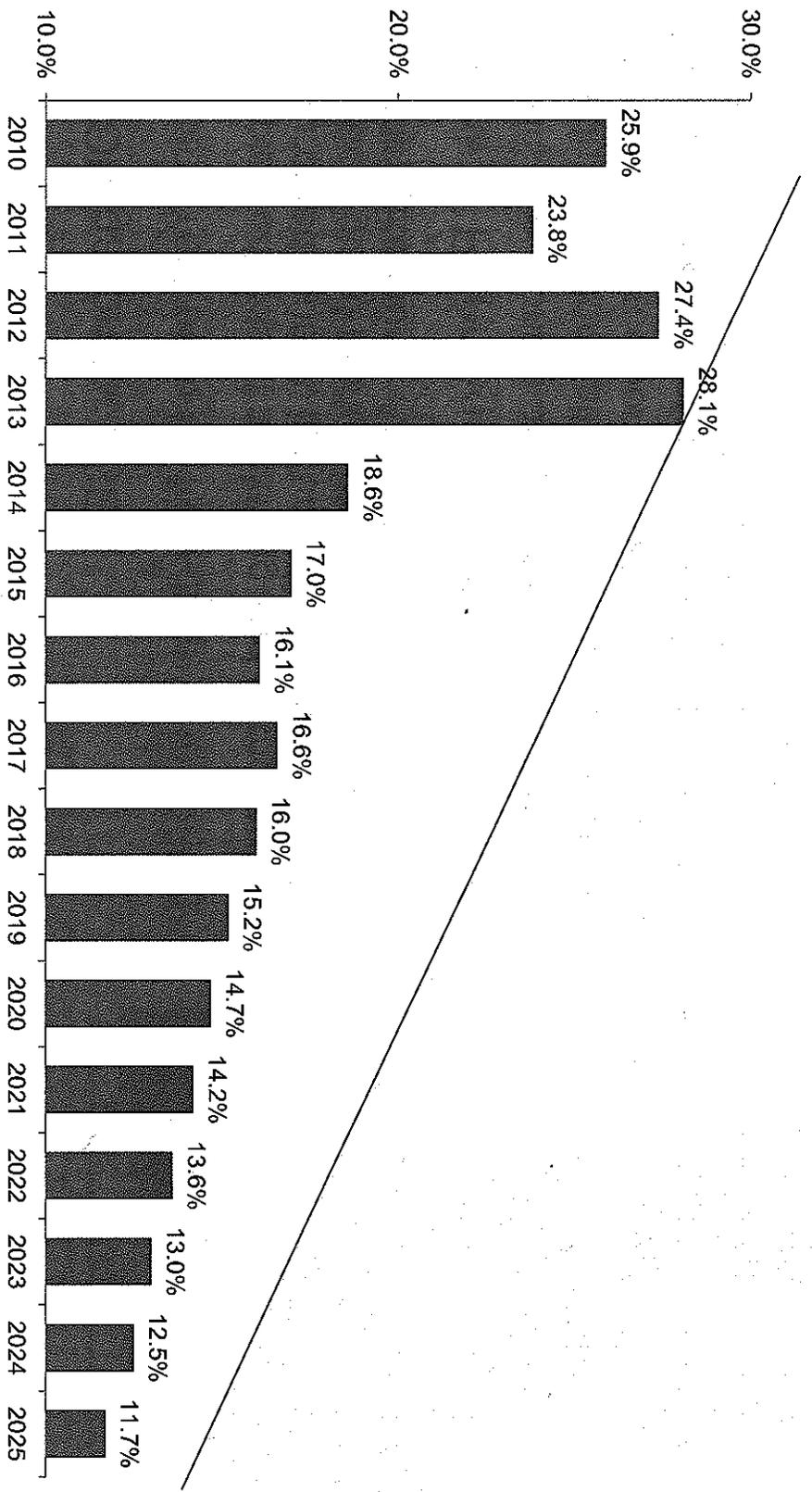
- In the MISO region, load-serving entities, with oversight by the States, are responsible for their resource adequacy
- Resource adequacy refers to the electricity industry's ability to ensure sufficient generating capacity is available to produce the amount of electricity needed on those highest demand (peak) days and some "additional" amount (Planning Reserve Margin) that can be accessed in the event of an unexpected outage of one or more power plants or a weather event.

MISO's Resource Adequacy Construct

- Annual Obligation for LSE's
 - Planning Year period is from June 1st to May 31st
 - Multiple methods of achieving and demonstrating resource adequacy, including self-supply, bilateral contracting and market-based acquisition via the Planning Resource Auction.
- Overview of Planning Resource Auction
 - Occurs two months ahead of Planning Year
 - Residual Auction - allows buyers and sellers to balance resource portfolio prior to Planning Year
 - Includes a locational requirement indicating the amount of capacity that must be secured from resources within each zone to meet reliability standards
 - If there are insufficient resources to meet demand in the auction, Resource Adequacy may not be achieved.



MISO is projecting declining reserve margins primarily driven by unit retirements



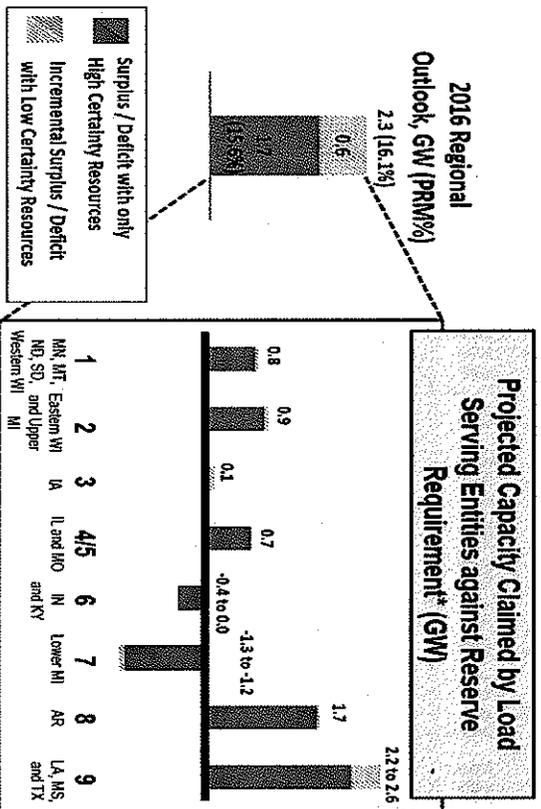
*2010-2014 actual reserve margins; 2015-2025 from MISO-OMS survey



Additional actions are required in the near term to ensure sufficient resources in future years

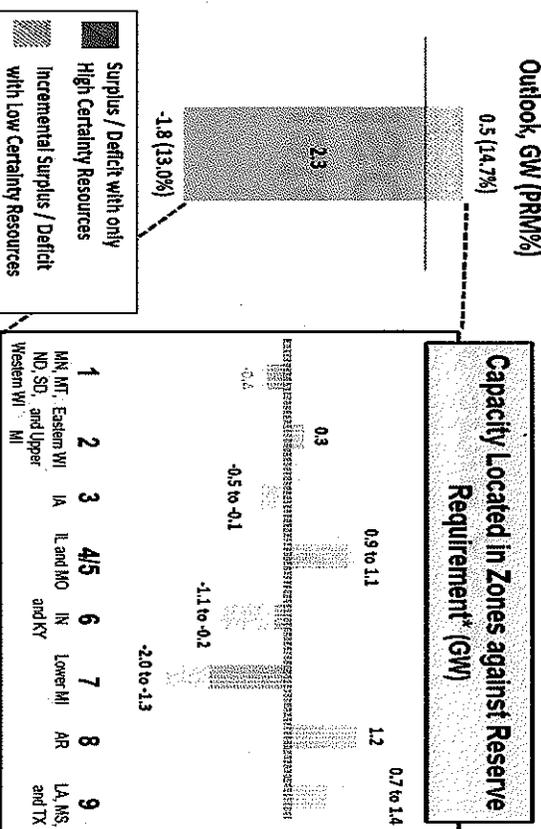
2016 Capacity Projections

In the near term, regional surpluses could address deficit for the footprint



2020 Capacity Projections

Additional actions needed to ensure sufficient resources beyond 2019



*Data from 2015 MISO OMS Survey

Ensuring Long Term Resource Adequacy

- **Resource Adequacy processes must exist to ensure long-term reliability and ensure Resource Adequacy outcomes in all time horizons.**
- **A process should exist to evaluate, plan, and commit resources for all loads in the MISO region.**
- **Michigan's proposed legislation could serve as a mechanism to satisfy those requirements.**

For additional questions:

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