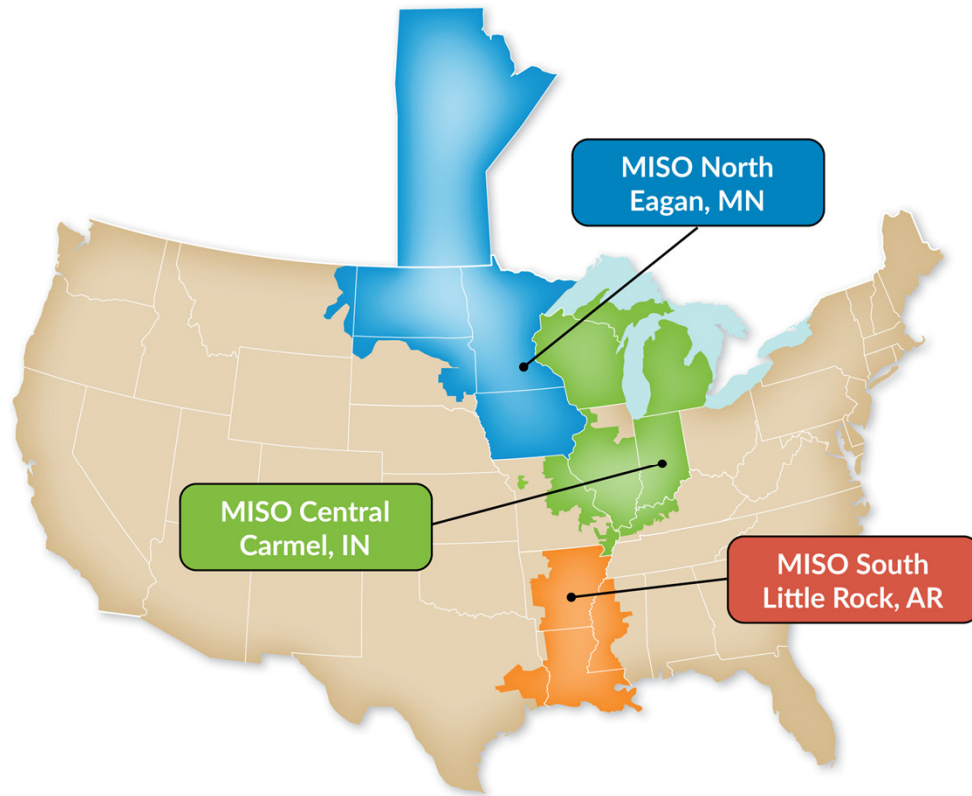




Piecing Together the EE & DER Aggregation Puzzle

Midwest Energy Solutions Conference
February 2, 2022

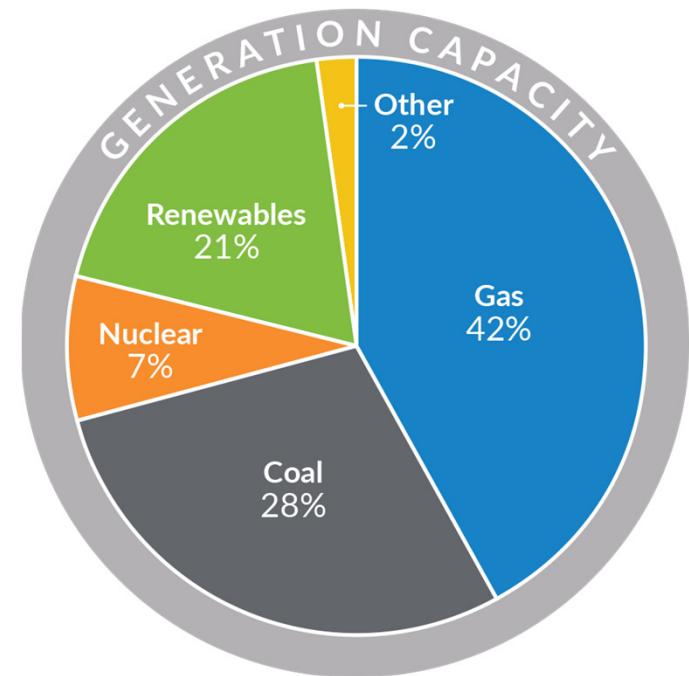
MISO drives value creation through efficient and reliable markets, operations, planning, and innovation



MISO's reliability footprint and locations of regional control centers.

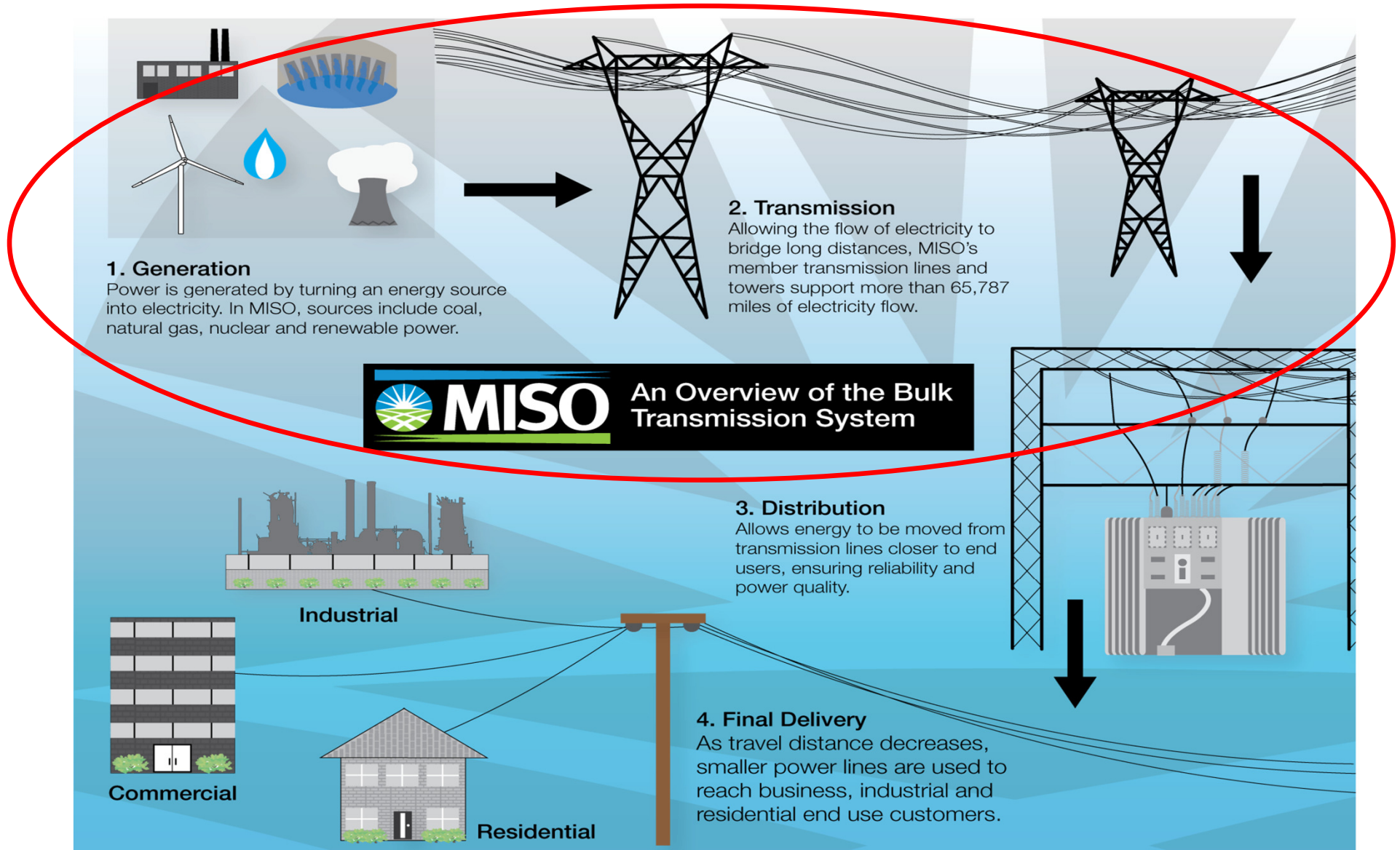
MISO by the numbers

High Voltage Transmission	65,800 miles*
Generation Capacity	184,287 MW
Peak Summer System Demand	127,125 MW
Customers Served	42 Million



As of 01/2022

MISO manages flows on the transmission system by directing generator usage



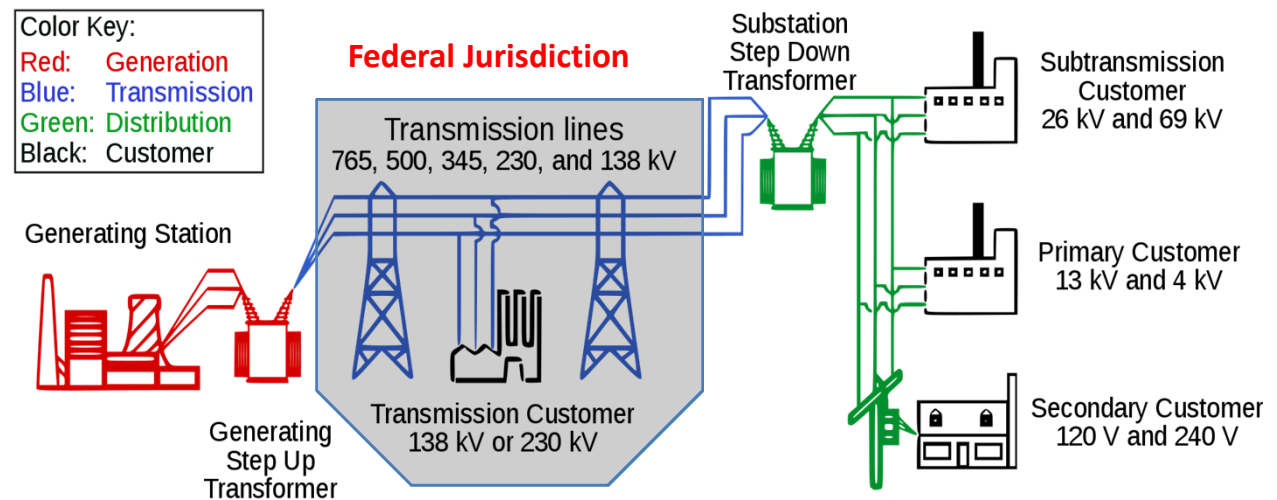
Today's Grid

State and Local Jurisdiction

- Utility operates its Distribution System
- Generation and Transmission Siting
- Retail Rates
- Resource Adequacy
 - Integrated Resource Planning
- Other State Policies
 - Energy Efficiency
 - Portfolio Standards

Federal Jurisdiction

- FERC derives jurisdiction from the Federal Power Act
- Wholesale Electric Rates
- Enforces open access to energy markets
- Regional transmission planning



FERC Order 2222 builds on MISO's work on DER



- FERC Order 2222 encourages the creation of a “coordination framework” to exchange information and control signals between the three levels of the US electric system;
 - the bulk electric system
 - the distribution system
 - the DER/customer level
- Coordination must extend beyond the technical; working with states, transmission and distribution entities, other ISO/RTOs, and regulators is necessary to ensure wholesale market participation works smoothly with distribution system requirements and retail pricing programs
- Order 2222 and the increasing importance of Decentralized assets is one piece of a complicated energy transition landscape



MISO's Coordination Framework



FERC Order 2222 recommends, but does not require, establishing a “Coordination Framework” to outline roles and responsibilities

MISO will establish such a framework for O2222. This framework will include:

- A series of meetings and communications with RERRAs, TOs, EDCs, and potential DERAs
- Tariff documentation of roles and operating or market participation agreements, including interoperability and communications

- MISO resources to manage questions and inquiries related to O2222

- Business Practices Manuals which outline O2222/ DERA participation in MISO markets and may include interoperability and communications (not usually completed as part of the compliance filing)

MISO’s scheduled EDC workshops, as well as RERRA meetings, are a part of the “Coordination Framework”

MISO has also pointed to existing processes and tariff language which will be used to model the O2222 requirements

- Metering and Settlements (enhancements to these will be determined)

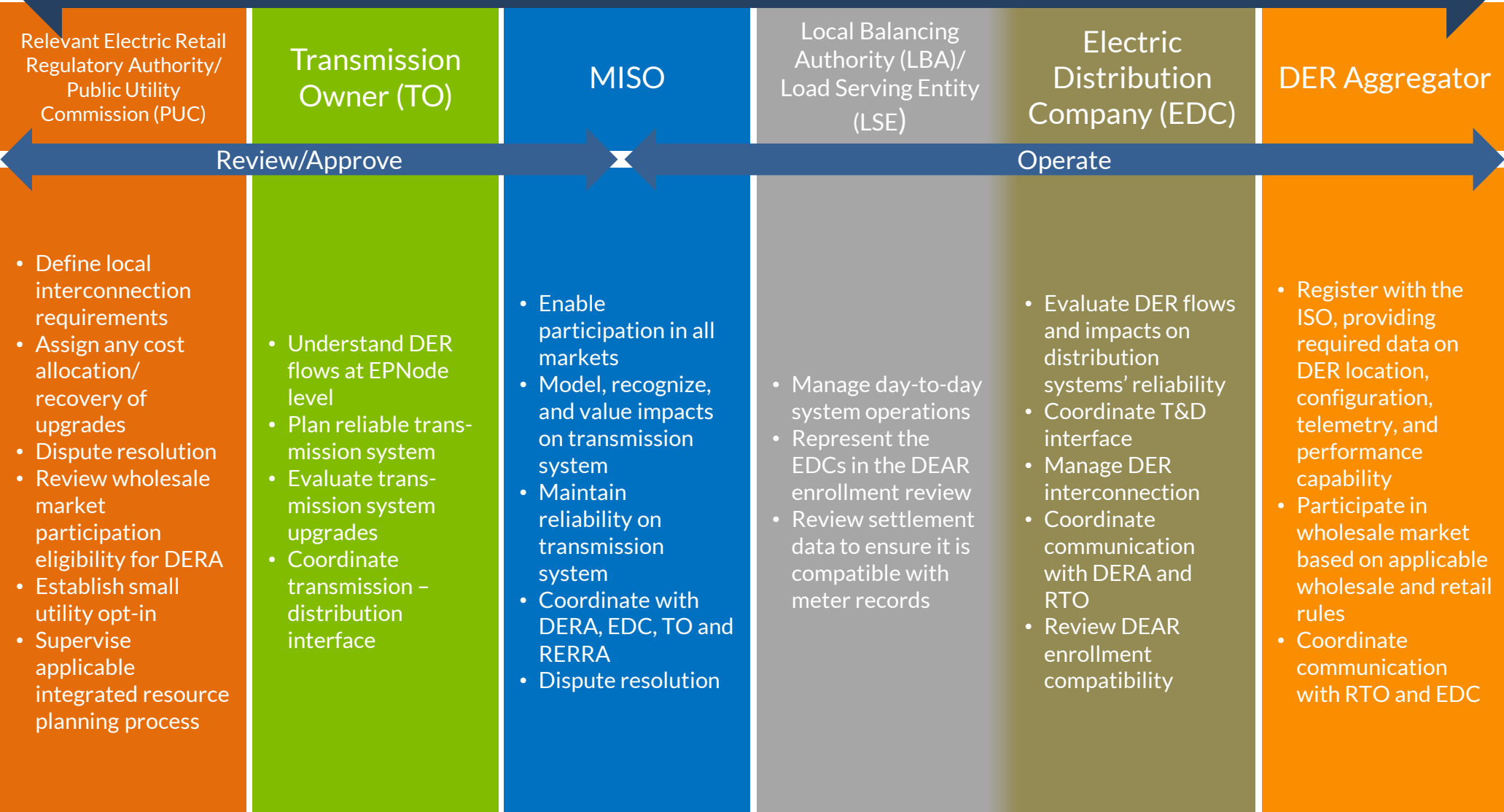
- Attachment HHH (created for Order 841) as a sample document

- Registration (upcoming workshop) for aggregators of retail customers, including EDC/ LBA/ RERRA review processes

FERC has called for collaboration across jurisdictions and seams; successful implementation requires developing new frameworks



MISO has the Facilitation Role in Order 2222





Limits of the MISO tariff

- During the stakeholder process at MISO, and by participating in EPRI working groups as well as following other RTO/ISO's as they develop O2222 responses, the MISO team has identified a number of items which cannot be addressed within the MISO tariff
 - Utilities must define the scale and scope of their technical review for reliability. Disputes may be raised to MISO or FERC, this is not ideal as neither has the technical information to adjudicate such matters.
 - There is the potential to charge for some wholesale market access through something like wholesale distribution service, though this application is not quite the same as what has come before.
 - Metering and submetering of individual devices is relatively immature and the billing systems of utilities are limited in their ability read more granular data in many cases.
 - There are data privacy concerns for individuals who participate in aggregations, as household-level data may be collected and transmitted in an unaggregated fashion.
 - Communication and cybersecurity of home-based devices may also be subject to new data privacy concerns.
 - Retail rates largely do not anticipate wholesale market access. There are hundreds or thousands of rates within the MISO footprint.
 - There is a time horizon disconnect between the MISO wholesale market and distribution operations, both because of day ahead wholesale markets and unexpected distribution level events.
 - MISO's utilities may deploy a number of technologies to manage DER, investments made locally will not all reach the same result. MISO must interface with all potential users.
 - Ongoing operational coordination is needed between TOs, EDCs and DERA. MISO will communicate with current members and the DERA as the Market Participant.

- Also raises questions of WHO has the information and WHAT needs to be done?
- We are addressing only wholesale sales, though EDC's perspective is critical



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