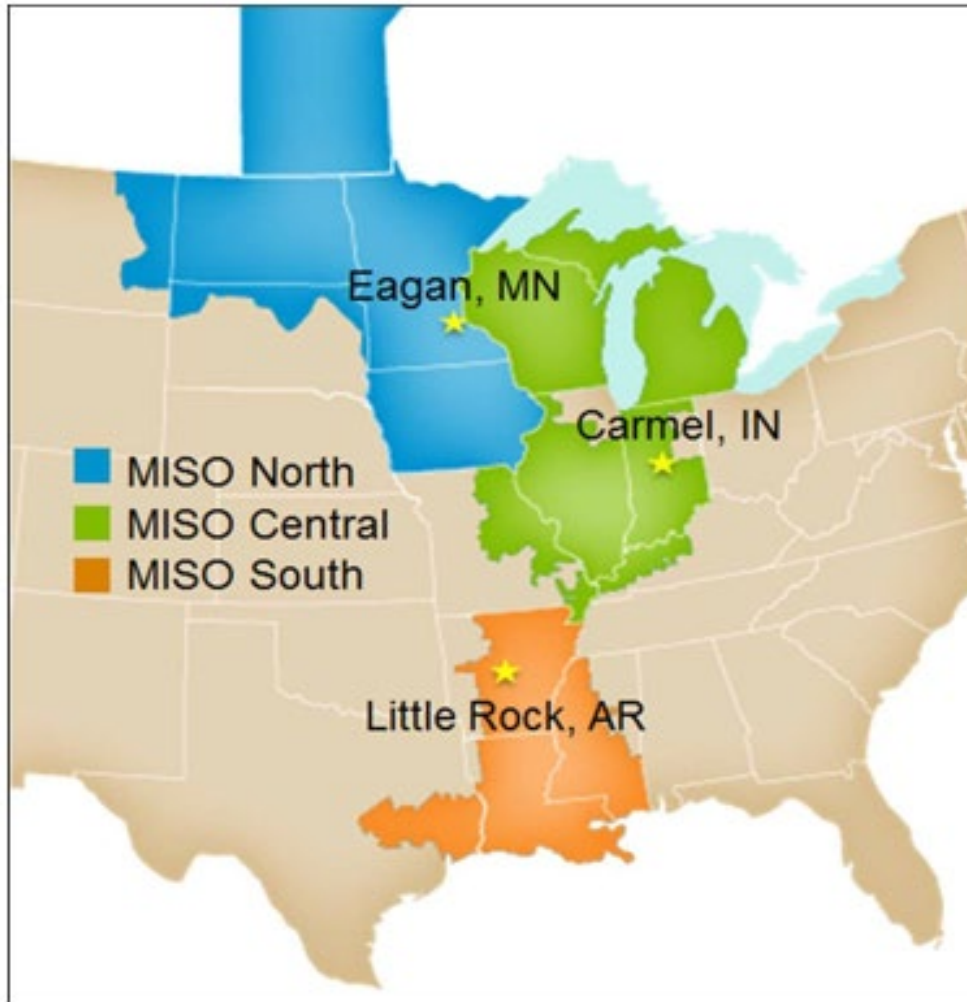


MISO: An Intro

June 9, 2020

MISO is an independent, non-profit organization in 15 US States and one Canadian Province



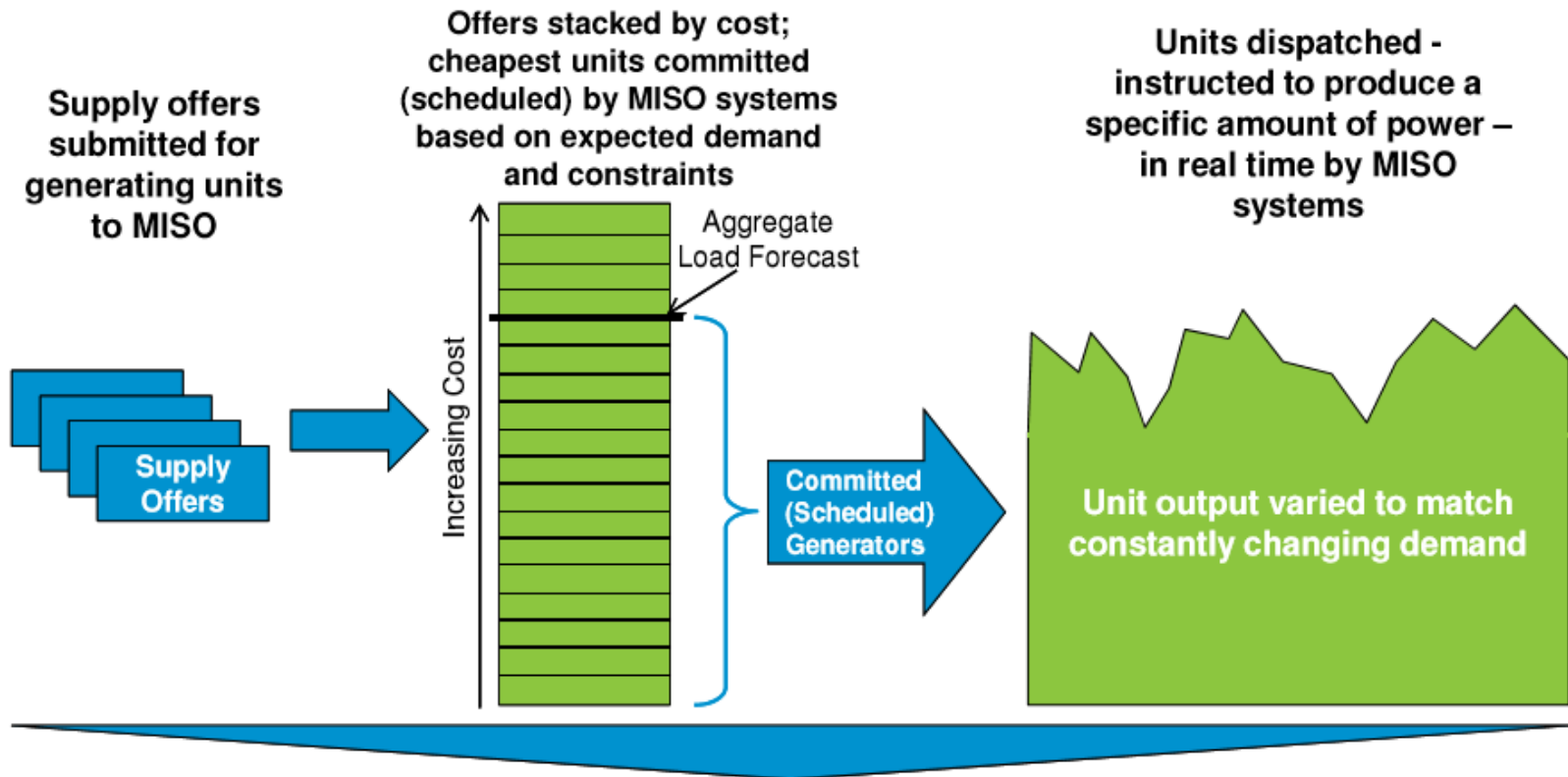
MISO by-the-numbers	
High Voltage Transmission	65,800 miles
Generation Capacity	174,000 MW
Peak System Demand	127,125 MW
Customers Served	42 million

MISO's Key Functions

1. Keeping the Lights On – Safe & reliable operation of the electric Grid
2. Operate Open Energy Markets – Scheduling & economic dispatch of generation to support reliability and efficiencies across the system
3. Transmission Planning – Comprehensive expansion plan that meets reliability needs, policy needs, and economic needs



Generation Dispatch



In accordance with MISO's FERC-approved Tariff:

<https://www.misoenergy.org/legal/tariff/>

MISO's Transmission Planning Principles

Develop a transmission plan that meets all applicable NERC and Transmission Owner planning criteria and safeguards local and regional reliability through identification of transmission projects to meet those needs

Make the benefits of an economically efficient electricity market available to customers by identifying transmission projects which provide access to electricity at the lowest total electric system cost expansion plan that meets reliability needs, policy needs, and economic needs

Analyze system scenarios and make the results available to state and federal energy policy makers and other stakeholders to provide context to inform regarding choices

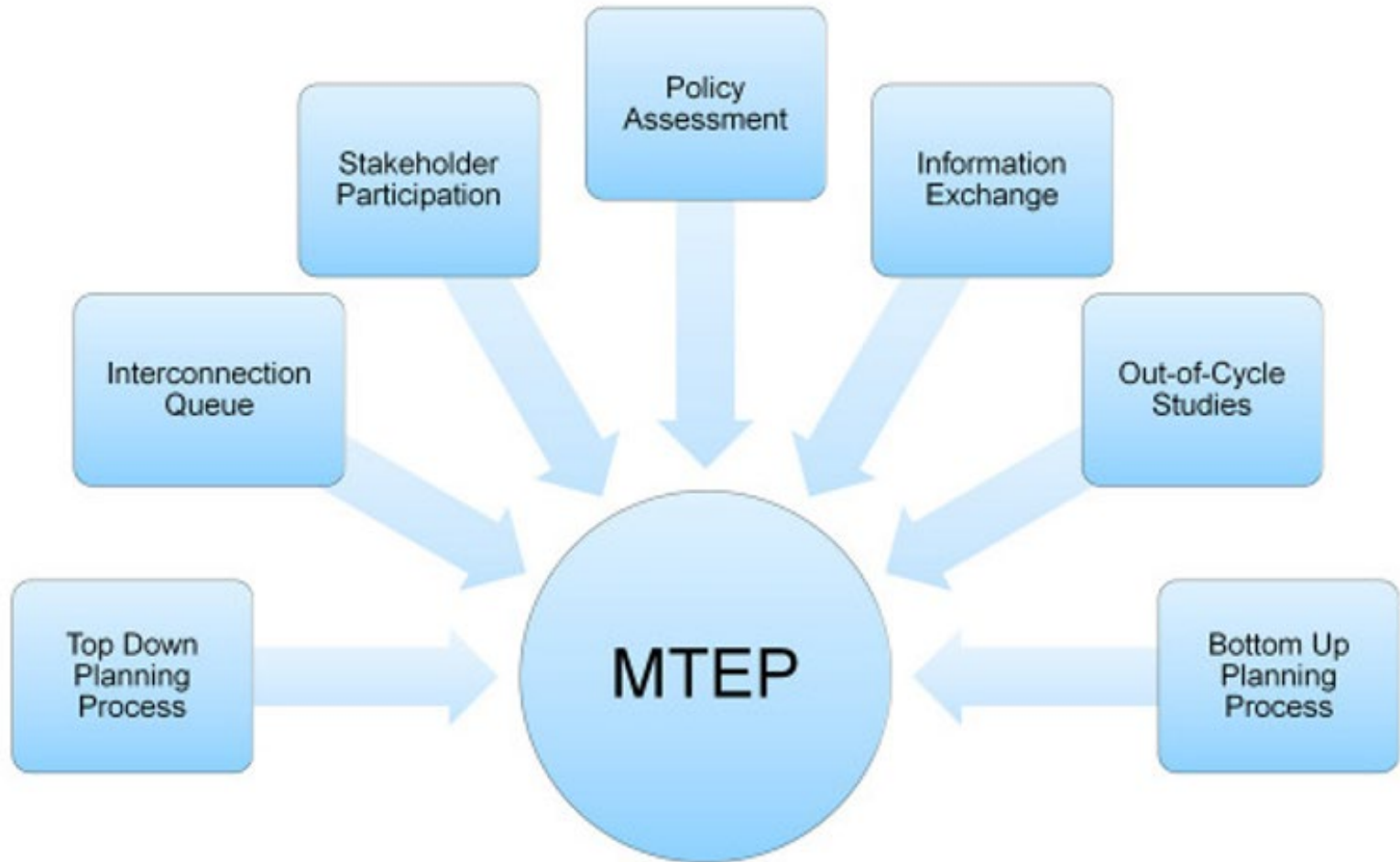
Fundamental Goal
The development of a comprehensive expansion plan that meets reliability needs, policy needs, and economic needs

Provide an appropriate cost allocation mechanism that ensures that costs of transmission projects are allocated in a manner roughly commensurate with the projected benefits of those projects

Coordinate planning processes with neighbors and work to eliminate barriers to reliable and efficient operations

Support state and federal energy policy requirements by planning for access to a changing resource mix

MISO Transmission Planning



Project types: reliability, economic, other (typically asset replacement), MVP

MTEP Projects

Types of Projects & Cost Allocation

Allocation Category	Driver(s)	Allocation to Beneficiaries
Participant Funded (“Other”)	Transmission Owner identified project that does not qualify for other cost allocation mechanisms.	Paid by requestor (local zone)
Transmission Delivery Service Project	Transmission Service Request	Generally paid for by Transmission Customer; Transmission Owner can elect to roll-in into local zone rates
Generation Interconnection Project	Interconnection Request	Primarily paid for by requestor; 345 kV and above 10% postage stamp to load
Baseline Reliability Project	NERC Reliability Criteria	100% allocated to local Pricing Zone
Market Efficiency Project	Reduce market congestion when benefits are 1.25 times in excess of cost	Distributed to Local Resource Zones commensurate with expected benefits; 345 kV and above 20% postage stamp to load
Multi Value Project	Address energy policy laws and/or provide widespread benefits across footprint	100% postage stamp to load

MISO Transmission Expansion Plan

MTEP 2019

We began the 2019 MISO Transmission Expansion Planning Report (MTEP19), in 2018 when stakeholders first submitted proposed transmission projects. MISO engineers and stakeholders continue to evaluate each proposed project to determine whether the project is appropriate for inclusion in MTEP19.

Transmission studies, featuring robust reliability and economic analyses, help MISO members make prudent planning and investment decisions to continue delivering reliable, least-cost energy. Reliability projects, including age and condition upgrades, a vital part of MTEP planning, account for the majority of all recommended projects.

MISO's Board of Directors approved the MTEP19 Report during its final meeting in December 2019. Documents posted below are final.



Highlights

- 480 new projects for inclusion in Appendix A to address reliability and aging infrastructure
- The first project recommendation within the MISO-PJM Coordinated System Plan
- \$23 billion in projects constructed in the MISO region since 2003
- Generator Interconnection queue grew to over 600 projects totaling around 100 GW

<https://www.misoenergy.org/planning/planning/mtep-2019-/>

MISO Tariff: Modules

Module A - Common Tariff Provisions 06/01/2020

Responsible Committee: TBPS

Module B - Transmission Service 06/01/2020

Responsible Committee: PAC

Module C - Energy and Operating Reserve Markets 06/01/2020

Responsible Committee: TBPS

Module D - Market Monitoring and Mitigation Measures 06/01/2020

Responsible Committee: TBPS

Module E-1 - Resource Adequacy 06/01/2020

Responsible Committee: RASC

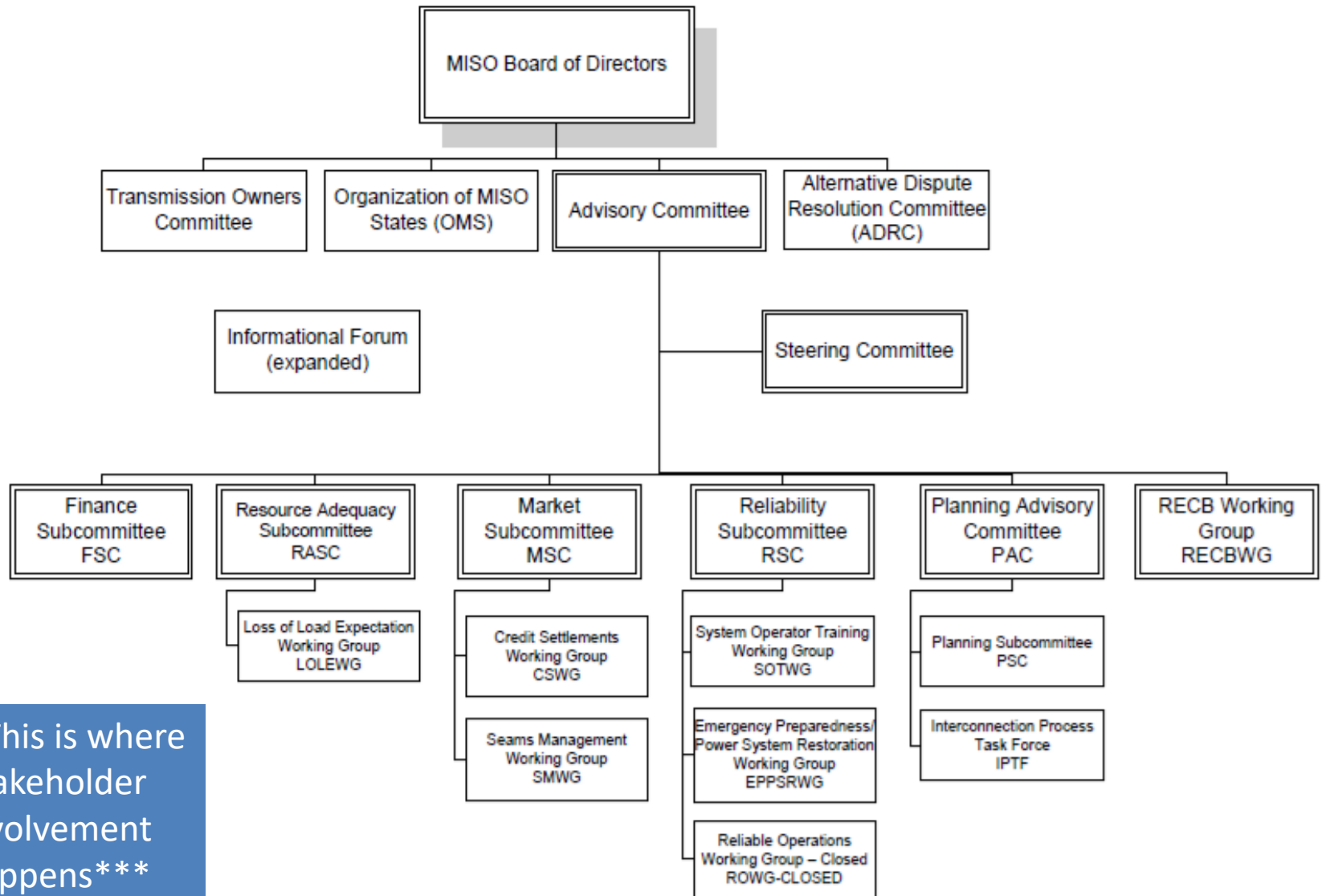
Module E-2 - Resource Adequacy 06/01/2020

Responsible Committee: RASC

Module F - Coordination Services 06/01/2020

Responsible Committee: RSC

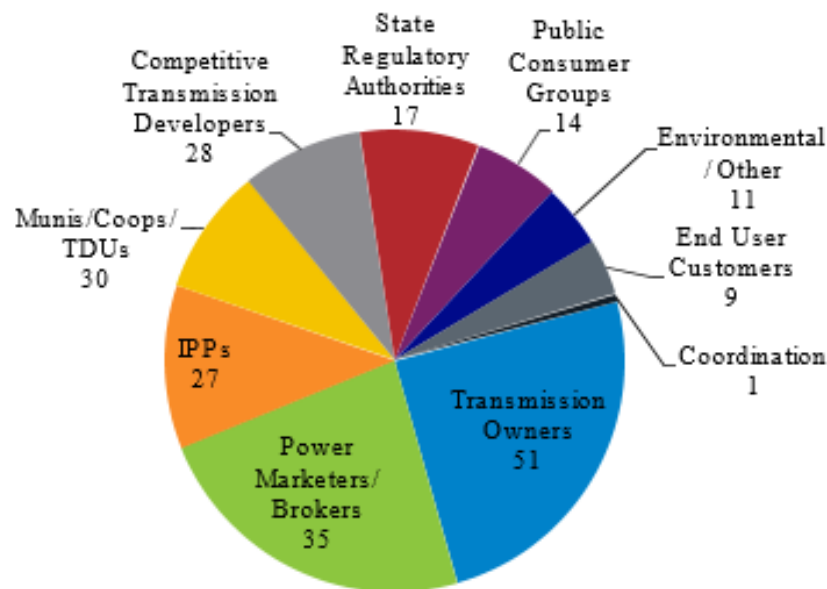
MISO Stakeholder Governance Structure



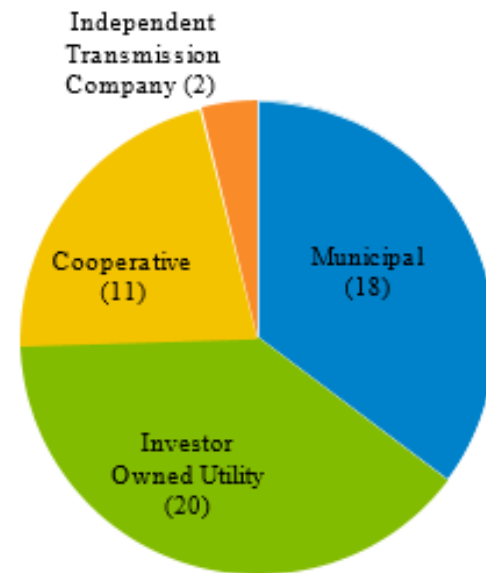
This is where stakeholder involvement happens

MISO Stakeholders

- ❑ Transmission Owner – Owns and maintains transmission lines.
- ❑ Market Participant (MP)/Customer – Anyone who conducts business within the MISO region. This is a financial relationship.
- ❑ Member – An entity that has voting rights within the MISO committee structure.
- ❑ Stakeholder – Any entity (or person) who is interested in activities at MISO. Primarily refers to those who participate in committee meetings.



MISO Stakeholders



Transmission Owners by Market Segment

Eastern UP Transmission Expansion Study

Request

- On August 17, 2016, Governor Snyder and the Michigan Agency for Energy (MAE) requested MISO to conduct an informational study to help Michigan understand the potential cost savings, reliability, and resource adequacy benefits of transmission and generation expansion in Michigan.
- The specific request was for MISO conduct an exploratory study to evaluate transmission expansion between the Upper Peninsula of Michigan and Ontario, as well as to Lower Michigan. MISO also received a request from MAE and the Michigan Public Service Commission to study two generation scenarios one in Kalkaska (Lower Peninsula) and one in Pine River (Upper Peninsula).

Results

- Currently there's no transmission connection between Ontario and the UP. The study indicated that with a new intertie, 125 MW can be transferred between Ontario and the UP. Significant reliability upgrades would be needed on both systems to increase that transfer capability.
- With limited transfer capability and relatively high construction cost, none of the transmission ideas provided enough benefit to cover costs. A generator sited in the UP provides comparable benefit to transmission ideas but still not provide high enough benefit to outweigh its cost.
- Additionally, the intertie between Ontario and the UP did not have any impact to the Local Reliability Requirement or the Capacity Import Limit for Zones 2 and 7.

Questions?

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