MISO Quarterly Update

Missouri Public Service Commission

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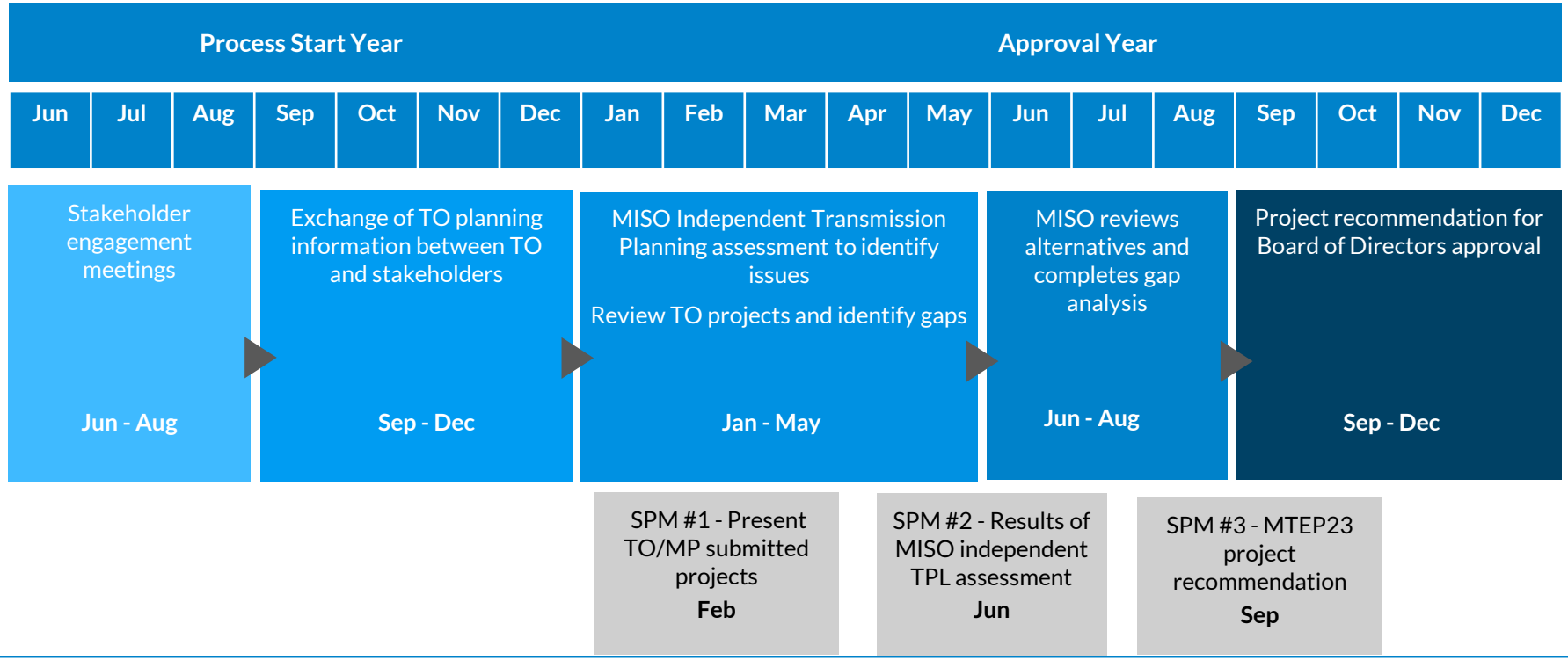
Agenda

- MISO Transmission Planning Update
- FERC Order 881 & Grid Enhancing Technologies (GETs)
- GridEx VIII

Stakeholder engagement is critical to the MTEP planning process

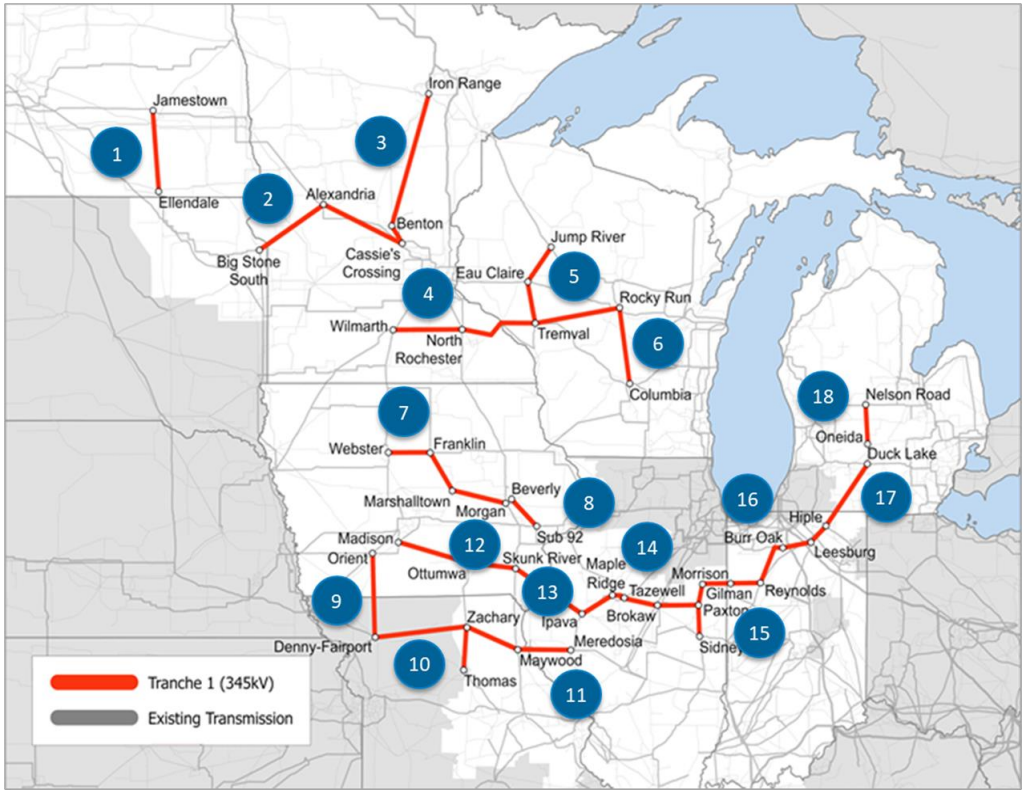


SPM: Stakeholder Planning Meeting

Transmission Owner (TO)/Market Participant (MP) proposed project submittals – Sep 15

MISO Board of Directors approved Tranche 1 in July of 2022 which included a 345kV portfolio across the footprint with widespread benefits

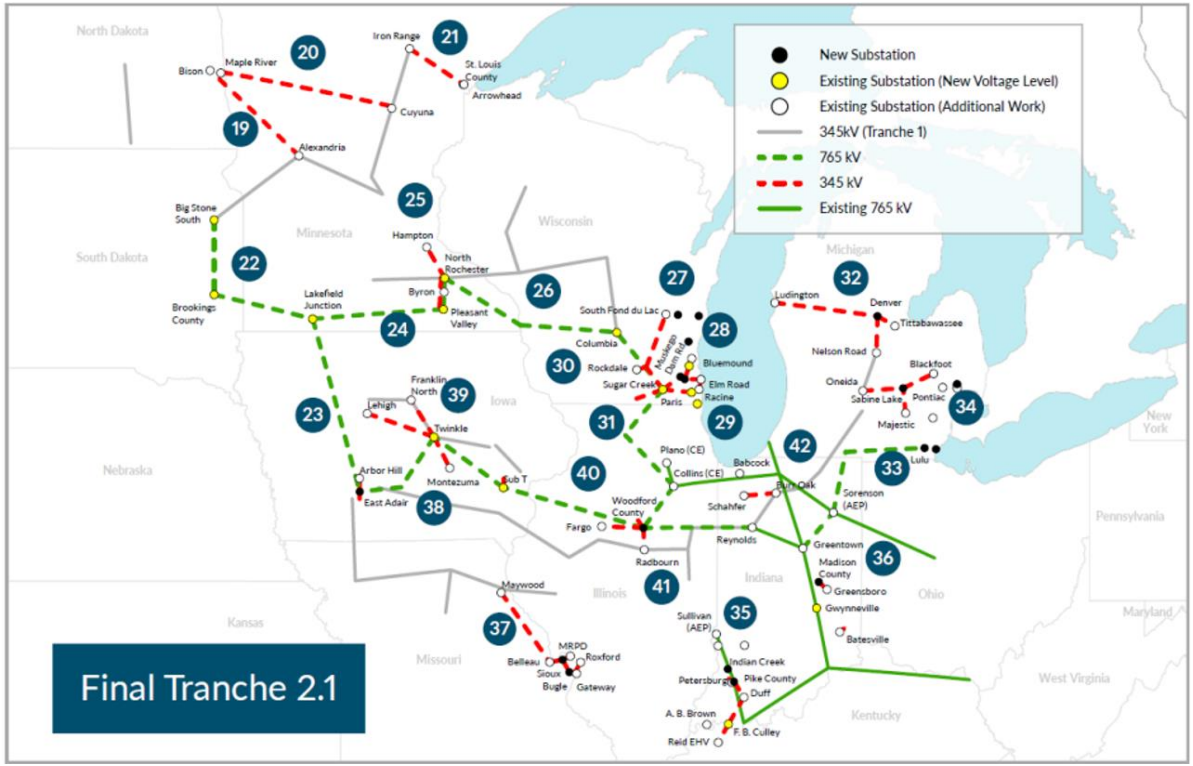
- *18-projects, $10.3 billion Midwest portfolio with a 2.6-3.8 Benefit/Cost ratio spread across the region*
- *Over 2,000 miles new transmission*
- *More than 200 formal meetings*



MISO's Long Range Transmission Planning: misoenergy.org/planning/transmission-planning/long-range-transmission-planning

MISO Board of Directors approved Tranche 2.1 in December 2024 which included a region-wide 765kV backbone with widespread benefits

- *24-projects, $21.9 billion Midwest portfolio with a 1.8-3.5 Benefit/Cost ratio spread across the region*
- *Over 3,600 miles new transmission*
- *More than 300 formal meetings*



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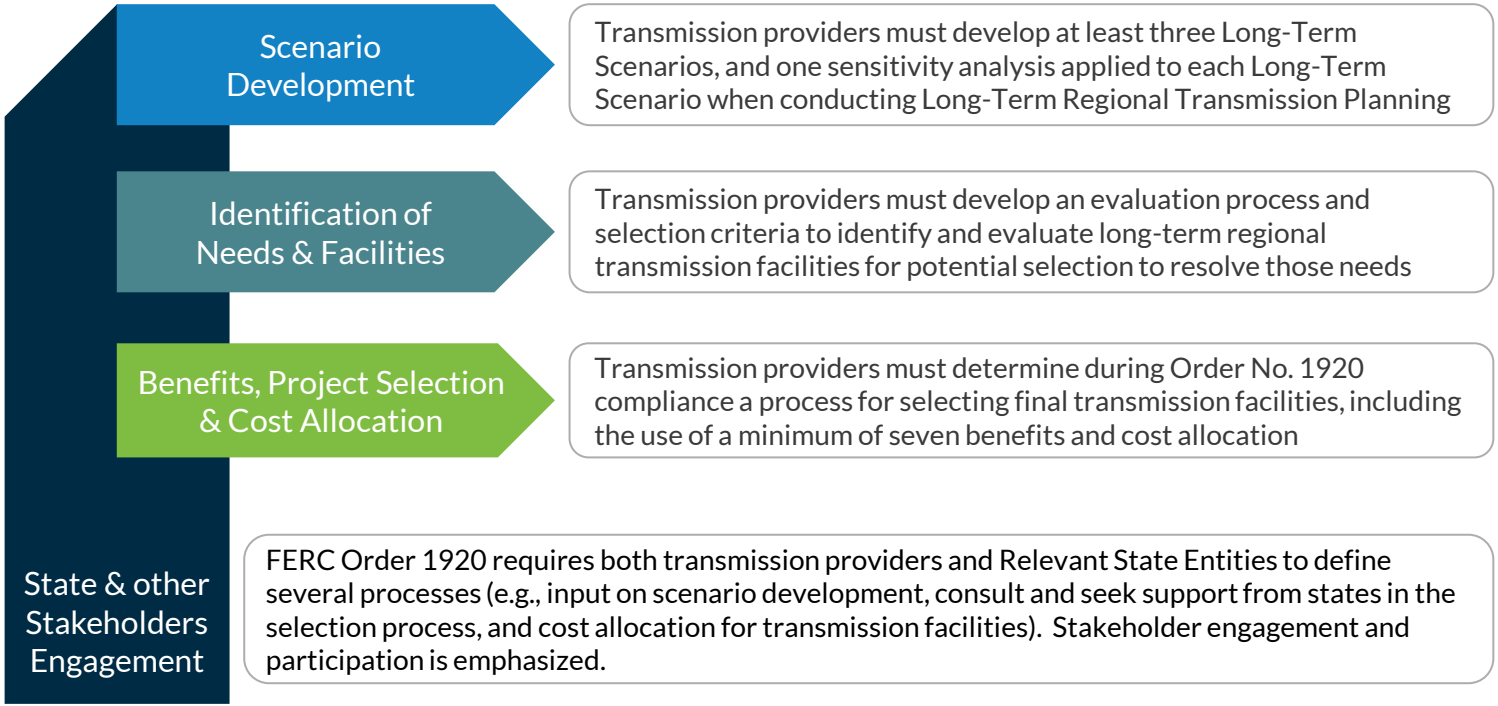
MISO is continuing to look at system needs, with the Futures redesign setting the stage for future regional and interregional efforts

*Status as of March 2025. A full list of project milestones is included in the appendix.

Order 1920 shifts planning from short-term needs to a proactive, cost-effective approach that enhances grid flexibility, delivers long-term value, and reduces system-wide costs. MISO believes that our processes are largely compliant.



FERC Order 881 & Grid Enhancing Technologies (GETs)

GridEx VIII planning is underway

Interested in collaborating?

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Appendix

FERC Order 1920/1920-A Quick Summary

2024	2025	2026	2027	2028
May FERC Issued Order 1920 **October** MISO Requested Regional Extension **November** FERC Issued Order 1920-A	**April** MISO Request 16-month Interregional Extension	**June** MISO Regional Compliance Filing **December (pending FERC approval)** MISO Interregional Compliance Filing		**June** Proposed Regional Compliance Implementation Date **December (pending FERC approval)** Proposed Interregional Compliance Implementation Date

FERC Order 1920/1920-A (3,000+ pages)

- Requires Long-Term Regional Transmission planning with a 20-year horizon, considering factors like changing resource mixes, demand fluctuations and potential future policy changes
- Includes requirements for transmission cost allocation, including voluntary funding
- Formalizes opportunities for Relevant State Entities input into planning and cost allocation processes
- Calls for additional coordination between transmission planning and new generation opportunities
- Considers alternative transmission technologies for regional facilities
- Provides opportunities for "right sizing" transmission facilities.

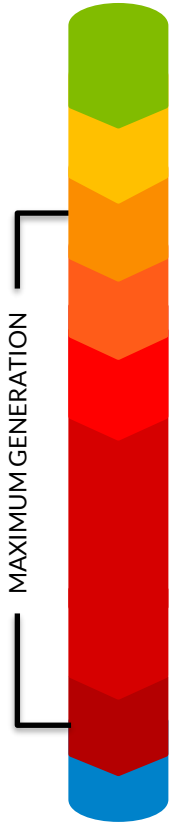
Series 2 Futures 1 -3, are proposed to largely mimic the assumptions of the Series 1/1A Futures; new Future 4 largely mirrors Future 2 assumptions while testing the impacts of changes to generation supply

Future Scenario Definitions

	Lower Load Growth		*Stated Policy*		*Higher Load Growth*		*Supply Shift*
	FUTURE 1		**FUTURE 2**		**FUTURE 3**		**FUTURE 4**
	Series 1 & 1A	*Series 2 (New)*	*Series 1 & 1A*	*Series 2 (New)*	*Series 1 & 1A*	*Series 2 (New)*	*Series 2 (New)*
Footprint Development	In line with 100% of utility IRPs and state legislation; and 85% of utility/state announcements	No Change	Companies/states meet their goals, policies and announcements	No Change	Companies/states meet their goals, policies and announcements	No Change	In line with supply frictions: limits build rate and causes tension with timelines of member plans and goals
Emissions	minimum 40% reduction from 2005 levels	No Change	minimum 60% reduction from 2005 levels	No Change	minimum 80% reduction from 2005 levels	No Change	minimum 60% reduction from 2005 levels, unless supply friction build rate violated
Load Growth	Consistent with current trends (0.35% CAGR)	Consistent with low-end projections (1.1% CAGR)	30% energy increase (0.8% CAGR)	Consistent with anticipated values (1.6% CAGR)	50% energy increase (1.1% CAGR)	Consistent with high-end projections (2.1% CAGR)	Consistent with anticipated values (1.6% CAGR) – additional Demand Response if needed
Generation Retirements	Age-based and member planned generation retirements	No Change	**Accelerated** age-based and member planned generation retirements	No Change	**Advanced** age-based and member planned generation retirements	No Change	No age-based generation retirements – delayed retirements if needed

IRP – Integrated Resource Plan
CAGR – Compound Annual Growth Rate
Series 2 (New) load growth CAGR starts from 2024. Series 1A Futures load growth CAGR starts from 2019

Summary of Market Capacity Emergency Procedure Steps



Normal Operations		Normal Pricing
Capacity Advisory	Advance notice of forecasted capacity shortage, requests Stakeholders update offer data	
Alert	Define boundaries/suspend maintenance, implement LMR Type – I resources	Emergency Pricing Tier 0
Warning	Schedule in external resources, curtail export transactions, activate reconfiguration	Emergency Pricing Tier I Offer Floor
Event Step 1	Commit emergency resources, declare NERC (Energy Emergency Alert) EEA 1, activate emergency limits	
Event Step 2	Declare NERC EEA 2, implement Load Modifying Resources (LMRs), Load Management Measures (LMMs) Stage 1, commit Emergency Demand Response (EDR) resources, emergency energy purchases, public appeals	Emergency Pricing Tier II Offer Floor
Event Step 3	Utilize operating reserves and LMM Stage 2	
Event Step 4	Reserve call and emergency reserve purchases	
Event Step 5	Declare NERC EEA 3, firm load shed, and set Locational Marginal Prices (LMPs) and Market Clearing Prices (MCPs) to the VOLL	Value of Lost Load (VOLL) Pricing
Termination	Terminate Max Gen and possibly Capacity Advisory	Normal Pricing

MISO has acted on many Reliability Imperative initiatives to address resource adequacy challenges, but there's more to be done

Ongoing Challenges

- Accelerating demand for electricity
- Rapid pace of generation retirements continue
- Loss of accredited capacity and reliability attributes
- Intermittent nature of new resource additions
- Delays of new resource additions
- More frequent extreme weather

Completed Initiatives

- ✓ Implemented Reliability-Based Demand Curve in 2025 PRA
- ✓ Non-emergency resource accreditation *(effective PY 2028/29)*
- ✓ Generation interconnection queue cap
- ✓ Improved generator interconnection queue process (*New application portal coming June 2025)*
- ✓ Approved over $30 billion in new transmission lines

Initiatives In Progress

- ❑ Implement Direct Loss of Load (DLOL)-based accreditation
- ❑ Enhance resource adequacy risk modeling
- ❑ Reduce queue cycle times through automation
- ❑ Implement interim Expedited Resource Addition Study (ERAS) process *(June 2025)*
- ❑ Demand Response and Emergency Resource reforms
- ❑ Enhance allocation of resource adequacy requirements

04/28/2025: MISO Planning Resource Auction for Planning Year 2025/26 Results Posting