Long Range Transmission Planning

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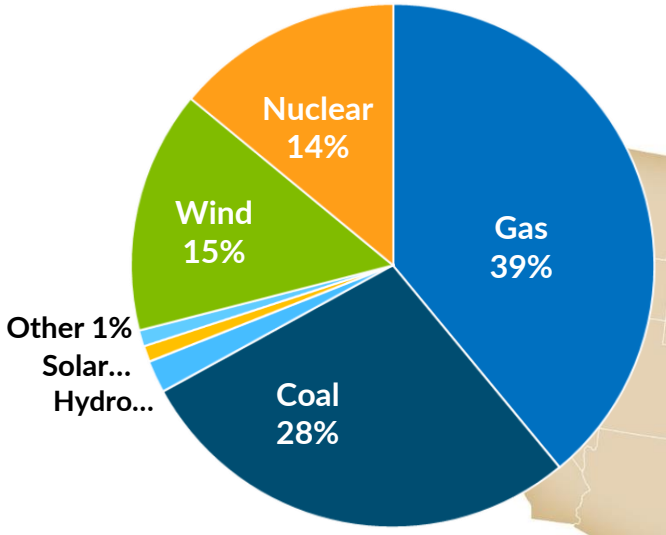
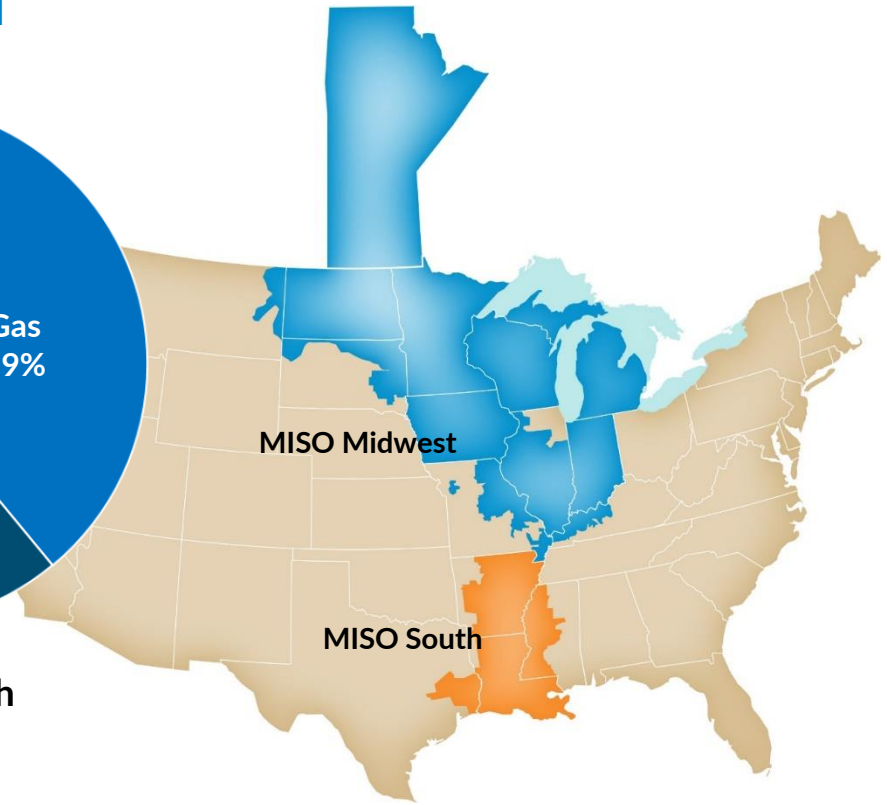
MISO enables the reliable delivery of low-cost energy through efficient, innovative operations and planning

GENERATION
Jan – Dec 2023



651 Million MWh



WHAT WE DO

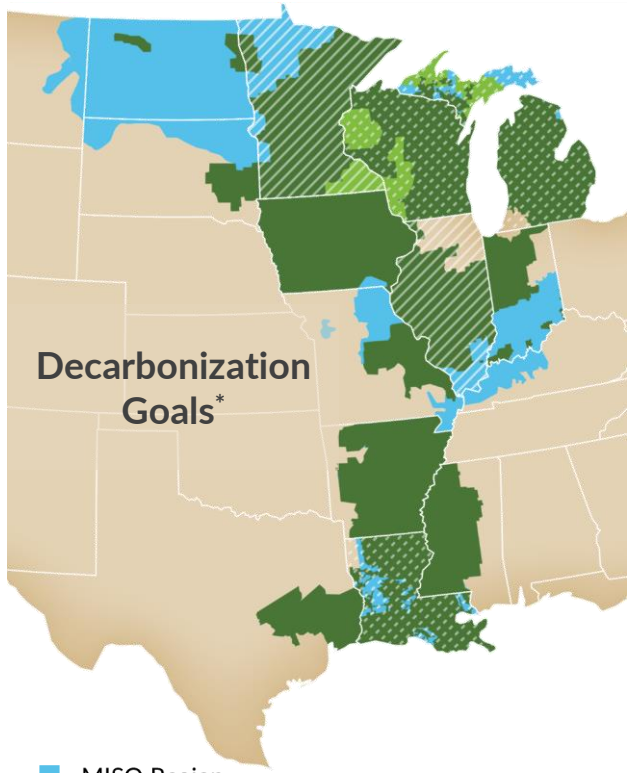
Provide independent transmission system access
Deliver improved reliability coordination through efficient market operations
Coordinate regional planning
Provide a platform for wholesale energy markets

MISO BY THE NUMBERS

15 states + Manitoba
45 million customers
$40 billion market
189,000+ MW generation capacity
75,000 miles of high voltage transmission lines

Other: Hydro, Diesel, Biomass, Storage, Demand Response Resources

Transmission Planning develops regional, long-term solutions to enable plans, policy goals and the future grid

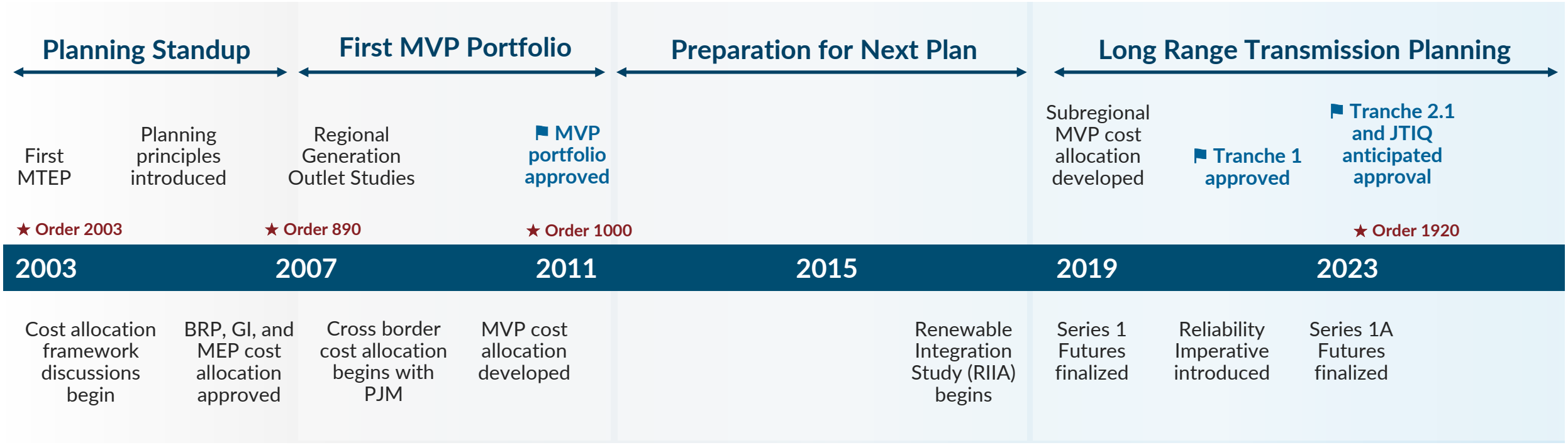


Recognize member and state goals across the entire footprint	Define a forward-looking resource expansion which conforms to member goals
Apply guardrails in several scenarios to show reliability and transmission value	Identify a least-regrets transmission build-out that hedges uncertainty
Recognize some issues will be addressed by MTEP** and Queue	Focus on regional solutions, rather than localized issues

*Map as of Feb 2023. Decarbonization goals are targets for reducing human caused carbon dioxide emissions. Clean energy and/or renewable goals comprise decarbonization goals **MTEP – MISO Transmission Expansion Plan

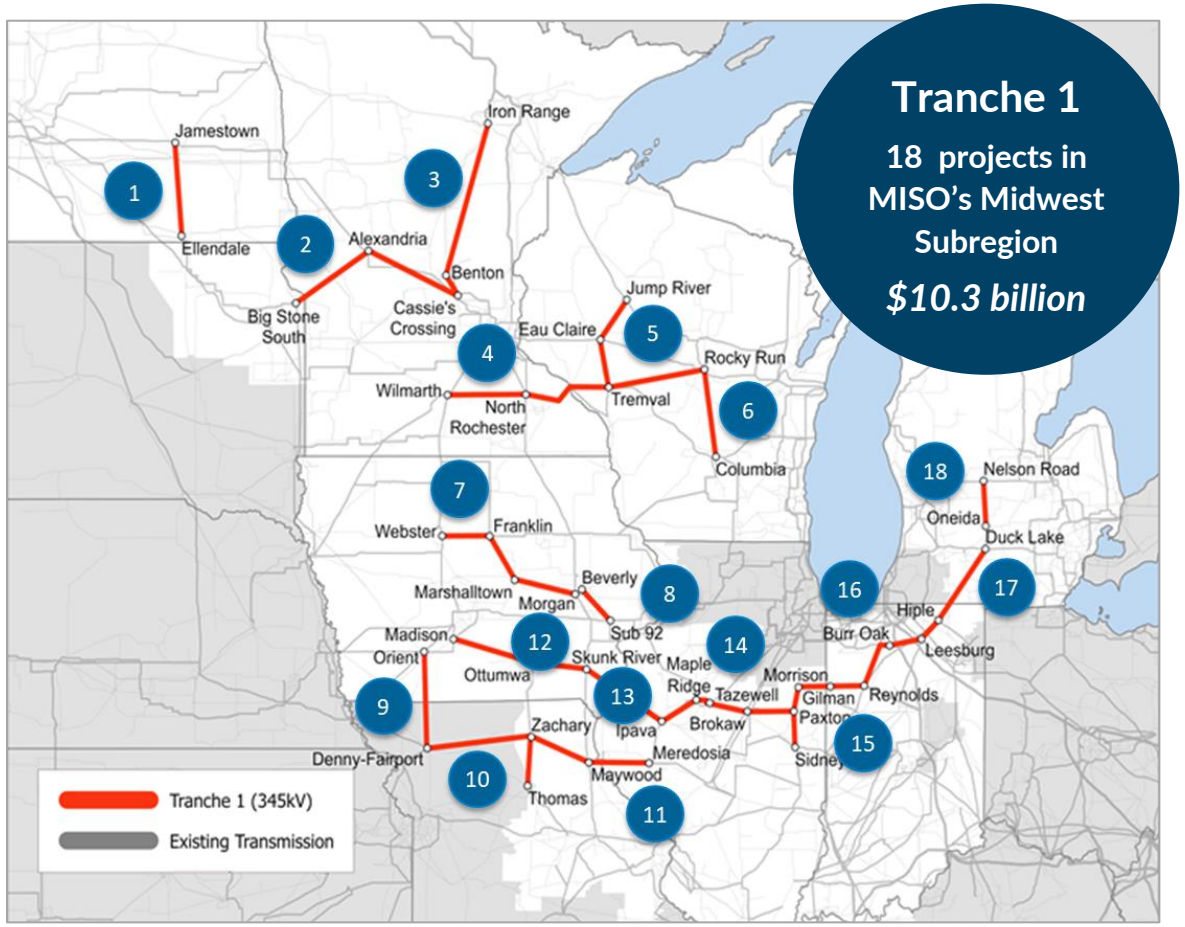
Planning has developed over time with robust stakeholder input to ensure alignment of costs and beneficiaries

LONG RANGE TRANSMISSION PLANNING HISTORY



MVP = Multi-Value Projects; JTIQ = Joint Targeted Interconnection Queue;
BRP = Baseline Reliability Projects; GI = Generator Interconnection; MEP = Market Efficiency Projects

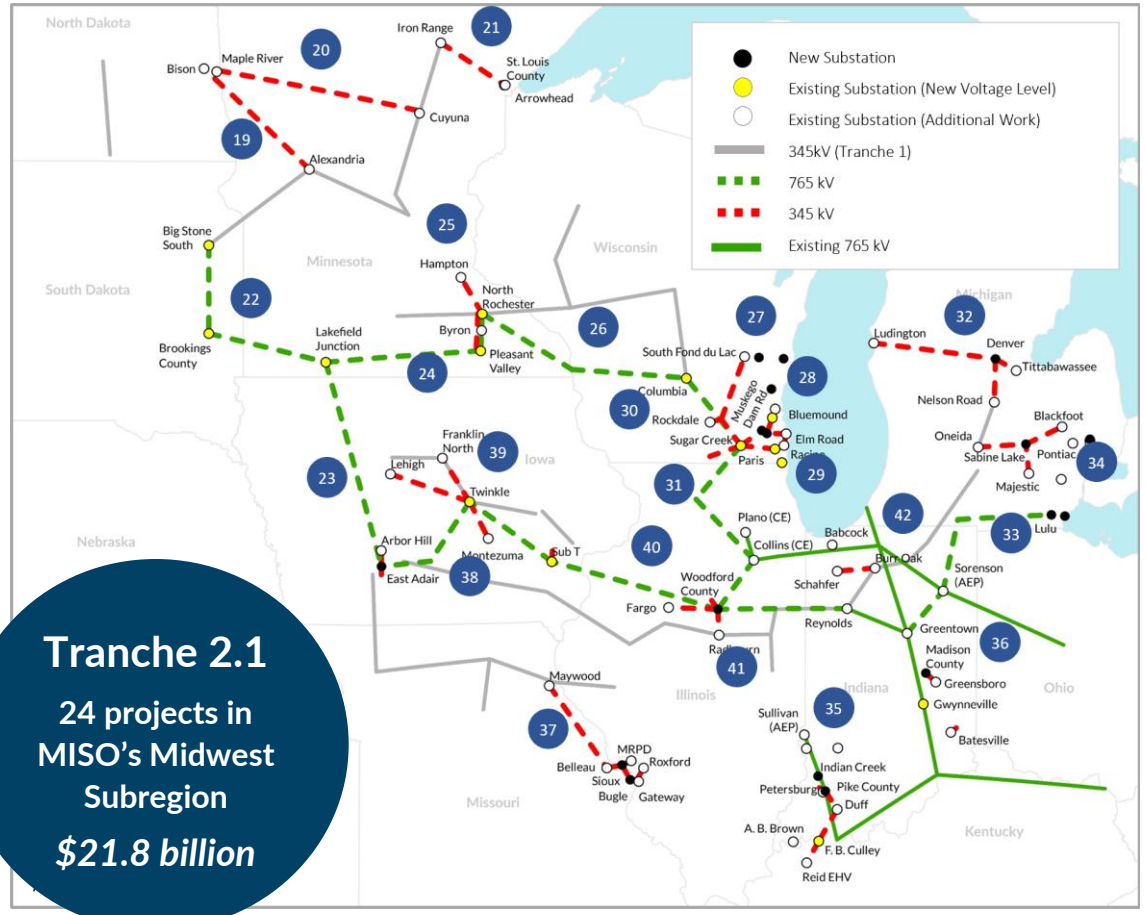
MISO is developing long-term plans in tranches, beginning with its Midwest Subregion



Tranche 1

18 projects in MISO's Midwest Subregion

$10.3 billion



Tranche 2.1

24 projects in MISO's Midwest Subregion

$21.8 billion

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

A wide range of benefits are used in the business case analysis in long-term planning

Reliability Benefits	1. Mitigation of reliability issues	Value of alleviating reliability issues which, if unresolved, introduce a risk of unserved load
	2. Reduced risks from extreme weather events	Increases grid resilience and decreases the probability of major service interruptions
Avoided Investment Benefits	3. Avoided capacity costs	Avoids capital costs for local resource builds versus regional expansions defined in Futures
	4. Capacity Savings from Reduced Losses	Value of reducing transmission losses during peak capacity periods
	5. Avoided transmission investments	Avoids the need for facility replacement due to age and condition
Production Cost Benefits	6. Congestion and fuel savings	Enhances market efficiency and provides access to low-cost generation
	7. Energy Savings from Reduced Losses	Lower production costs to serve load with transmission facilities that reduce system losses
	8. Reduced transmission outage costs	Reduced transmission congestion during forced and planned transmission outages
Environmental Benefits	9. Decarbonization	Enables the economical dispatch of renewable resources to help reduce the carbon footprint

Link to LRTP Tranche 2.1 metrics whitepaper

MISO is evaluating FERC Order 1920, but believes more long-term planning will help ensure future reliability

Key Order 1920 Requirements as Outlined by FERC

- Conduct and periodically update long-term transmission planning to anticipate future needs
- Identify opportunities to modify in-kind replacement of existing transmission facilities to increase their transfer capability, known as “right-sizing”
- Consider a broad set of benefits when planning new facilities
- Customers pay only for projects from which they benefit