



Transmission Planning

OMS Cost Allocation Principles
Committee (CAPCOM)

October 19, 2020

Executive Summary



- The MISO Transmission Expansion Plan (MTEP) provides a reliable and efficient plan through multiple coordinated planning processes and with transparent stakeholder engagement
- The final projects submitted in MTEP are those determined to best address an identified issue. MISO then applies a tariff-prescribed project categorization hierarchy with associated cost allocations

MISO transmission planning is comprehensive and aligns with the guiding principles of the MISO Board of Directors which incorporate similar principles as those of the OMS



Market access

Provide access to electricity at the lowest total electric system cost



Cost allocation

Ensure project costs are commensurate with planned benefits



Planning criteria

Meet policy and transmission owner planning criteria while safeguarding local and regional reliability



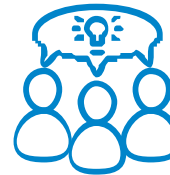
Information exchange

Analyze system scenarios and share with policy makers and stakeholders



Policy alignment

Align planning for changing resources with state and federal policy



Regional coordination

Plan with neighbors to eliminate barriers

Certain conditions must be satisfied to implement a transmission plan

Aligned Interests

Consensus on transmission required to address the footprint's collective needs



Robust Business Case

Include an analysis of benefits and costs for each project



Cost Allocation

Assign cost roughly commensurate with benefits

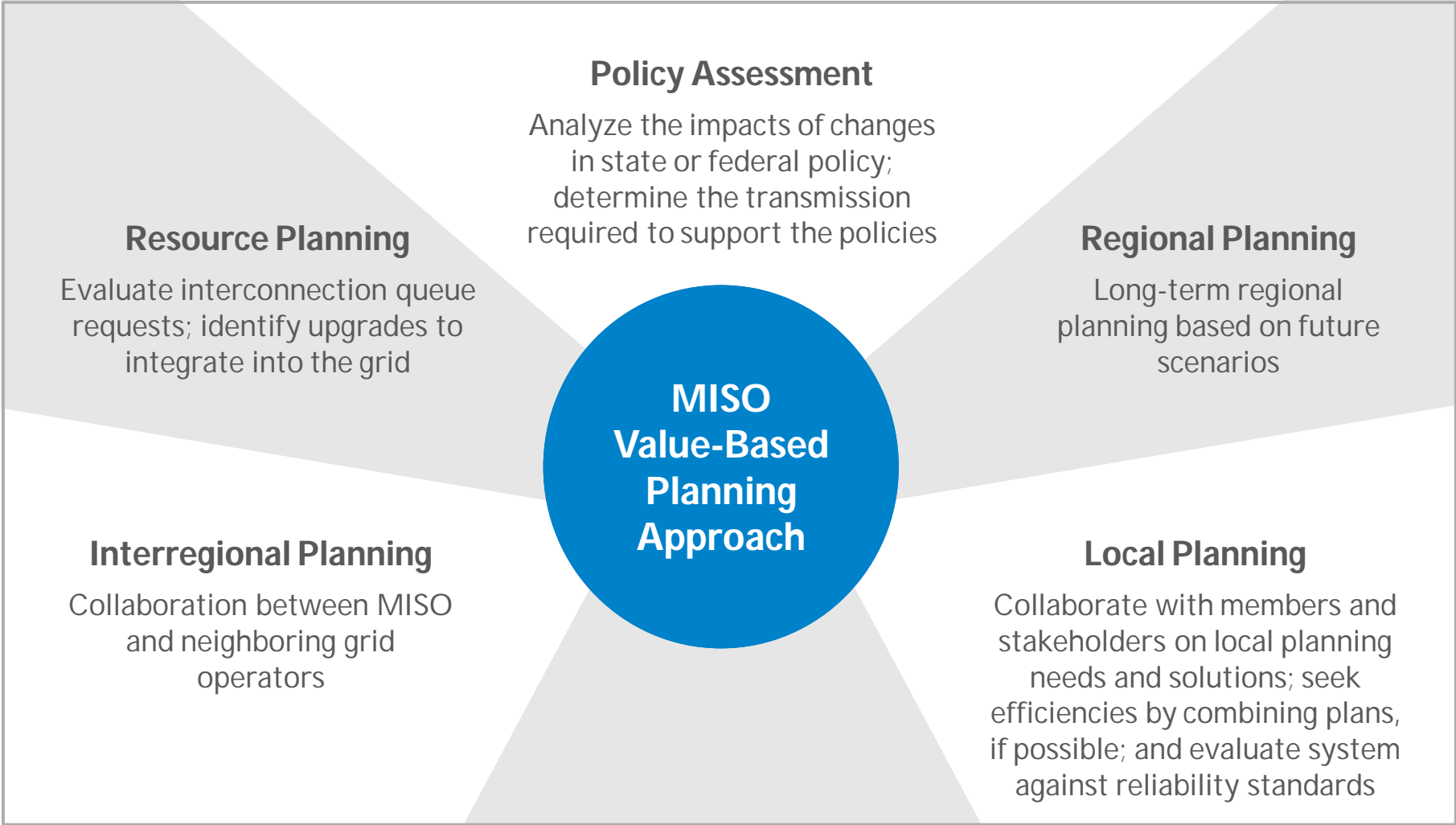


Cost Recovery

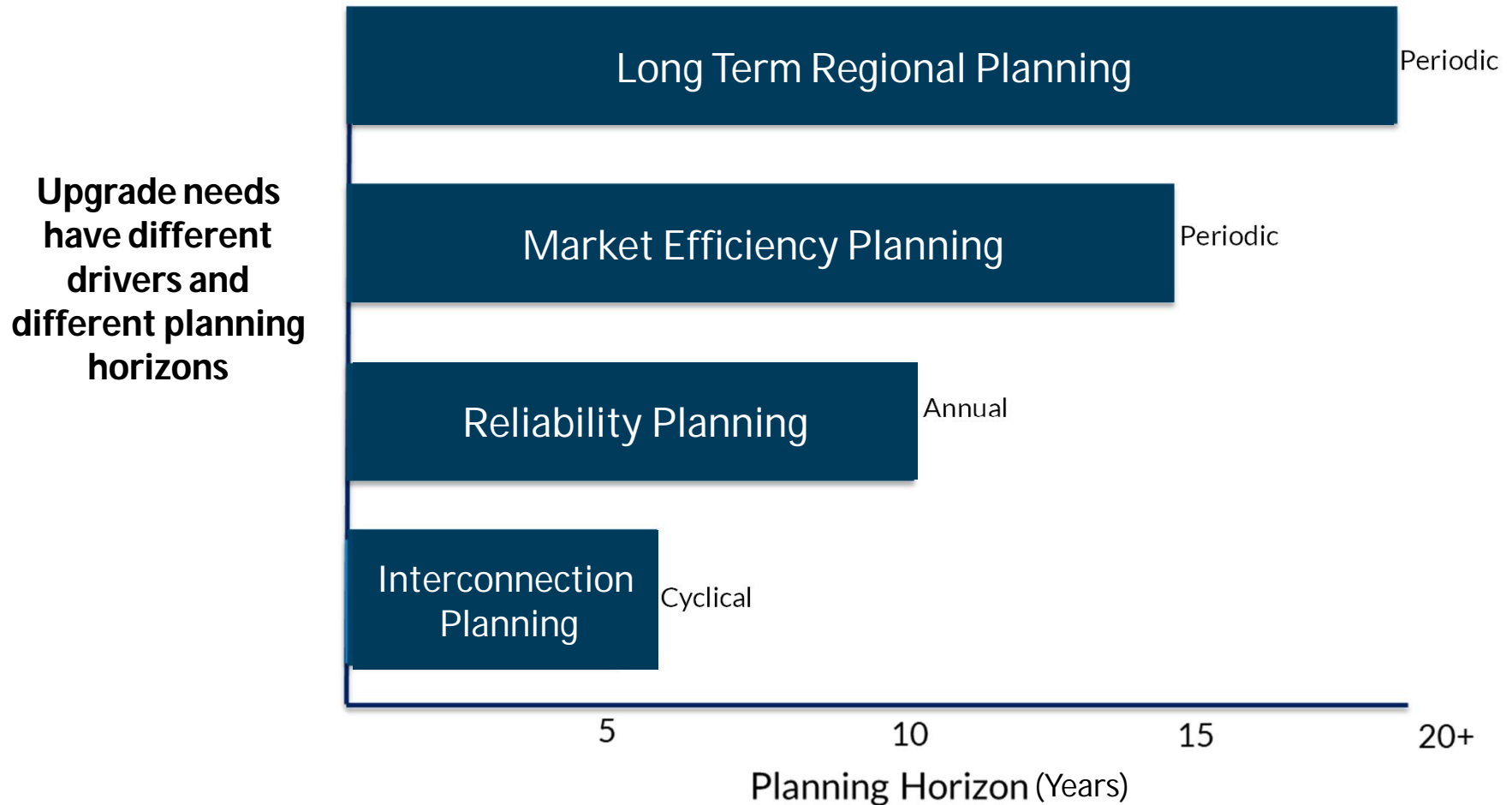
Reduce financial risk with recovery mechanisms



MISO's planning process ensures local needs are integrated with regional requirements

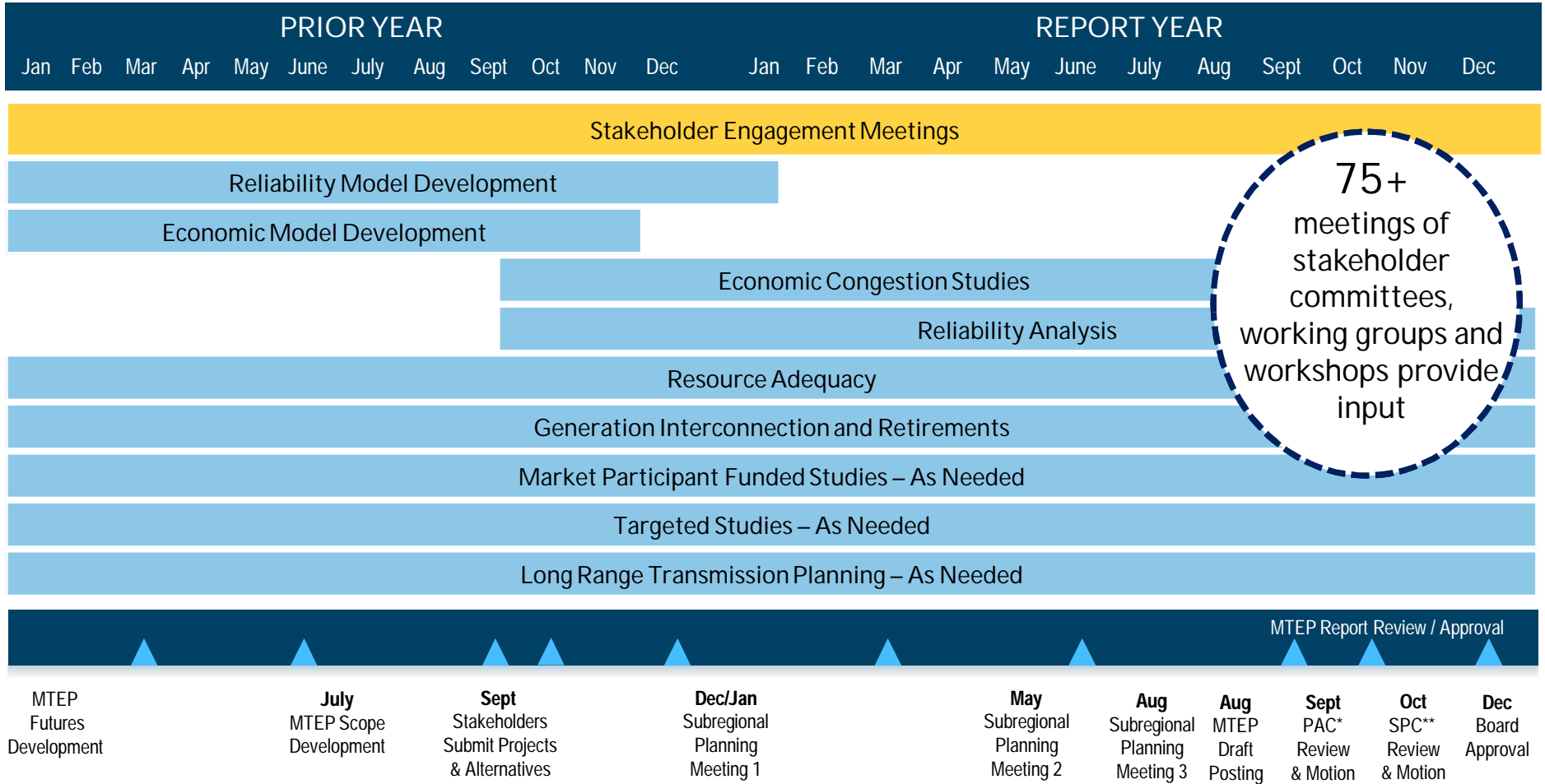


Transmission planning provides a comprehensive approach that covers short and long term needs to address generation additions, ongoing reliability, market efficiency and policy trends



MTEP is developed in overlapping cycles and delivered annually

Typical MTEP Cycle



75+ meetings of stakeholder committees, working groups and workshops provide input

Transmission planning activities culminate in the MISO Transmission Expansion Plan (MTEP)



In this MISO Transmission Expansion Plan, the Board of Directors recommends \$4.159 billion of new transmission expansion projects for construction, subject to Board of Directors' approval.

Highlights

- 515 new projects for inclusion in Appendix A to address reliability and aging infrastructure
- \$24 billion in projects constructed in the MISO region since 2003
- Generator Interconnection queue grew to 720 projects totaling 109 GW



Reliability through a Long-Range Lens

Our energy ecosystem is in a constant state of change shaped by established generation, as well as a technology renaissance centered around resources like battery storage, wind and solar power. Large business customer sustainability policies and member utility plans are driving this change. Furthermore, aging conventional units, and the addition of intermittent wind and solar resources, fundamentally change the characteristics of the resource base. While grid operators take strategic capability and uncertainty in the system for decades, MISO expects this to become more profound, making it more challenging to manage the region's energy supply, load and reserves. MISO has identified three key areas on which to focus: availability, flexibility and visibility.

It is imperative for MISO to evolve our market, operations and system planning to support investment and retirement decisions the states and utilities in our region are making today, while maintaining systemwide reliability and efficient operations going forward.

MISO received a clear message of urgency from its stakeholders, including resource owners, policy makers concerned with all customer classes, vendors and legal and accountants, asking MISO to move quickly to identify specific solutions enabling its diverse constituency to reach their goals during this fundamental industry transition.

MISO's energy risk has already changed considerably since 2005, and is expected to continue to do so.

It is critical to assess these events, evaluate the importance of resilient transmission systems, and inform both short-term and long-term planning efforts in view of customer needs and the resource portfolio mix. The fundamental planning includes a consensus that a unified effort is required to address sub-regional and collective needs, a deeper analysis of resource base and solutions and ensuring allocation of cost that is roughly commensurate with benefits to each area.

By far, the biggest challenge is to build precisely what is needed for the future and avoid building too much or too little. Ultimately, transmission will play an important role in ensuring the deliverability of power to enable resources to work in concert with one another and provide grid stability and the increasingly regional flow of electricity. And, we must work more quickly towards best practices as impacts of the portfolio transition are already happening.

Traditional resources that have historically been used to balance the system are retiring.

Total Approved Substantive since 2005 (GW)

Resource Type	Percentage
Coal	2%
Nuclear	2%
Gas	2%
Hydro	2%
Wind	2%
Solar	2%
Other	2%
Unlabeled	70%

Projects approved for MTEP are listed in Appendix A of the report and most typically consist of these project types

Transmission Studies | Resource Adequacy | Policy Landscape | Regional Energy Adequacy

COMMON MTEP PROJECT CATEGORIES

Market Efficiency Projects	Baseline Reliability Projects	Generator Interconnection Projects	Transmission Deliverability Service Projects	Other Projects
Address market transmission congestion	Required to meet standards for both NERC and regional reliability	Needed to reliably connect new generation to the transmission grid	Enable transmission service	Address local reliability issues and/or provide local economic benefit

Stakeholder Input and Consideration

Projects types are determined by criteria in MISO's Tariff

Project Type	Description	Allocation to Beneficiaries	Typical Process
Multi-Value Project	Above 100 kV and project cost of \$20 million or more, evaluated as part of a portfolio of projects and must meet one of three criteria	100% to load on a load-ratio share basis (postage stamp)	Longer-term, regional planning to accommodate policy, economics and reliability
Market Efficiency Project	230 kV and above and project cost of \$5 million or more, reduce market congestion when benefits are 1.25 in excess of costs	100% distributed to zones commensurate with expected benefit, based on the benefit metrics described in Attachment FF-7	Collaborative, regional study effort that identifies projects meeting a benefit cost ratio (typically via Market Congestion Planning Studies)
Baseline Reliability Project	NERC Reliability Criteria	100% allocated to local Transmission Pricing Zone	Local reliability studies to satisfy annual NERC requirements
Generation Interconnection Project	Interconnection Request	Primarily paid for by requestor; 345 kV and above 10% postage stamp to load	Externally driven as needed to interconnect specific projects
Transmission Delivery Service Project	Transmission Service Request	Directly assigned to Transmission Customer; (TO can elect to roll-in into local zone in some circumstances)	Externally driven, request based, as needed to provide requested service
Participant Funded	Projects that are funded by a Market Participant	The Market Participant funds the project. TO owns.	Projects requested and funded by a specific market participant and not already identified in MTEP processes. MISO does not verify need; simply confirms it will do no harm
Other	Project that does not qualify under other project categories	The costs of these projects are recovered in Transmission Pricing Zone	Part of MTEP general planning process and addresses either local reliability or economic efficiency need

MISO's planning process works to identify the best project to solve an identified issue – then determine cost allocation

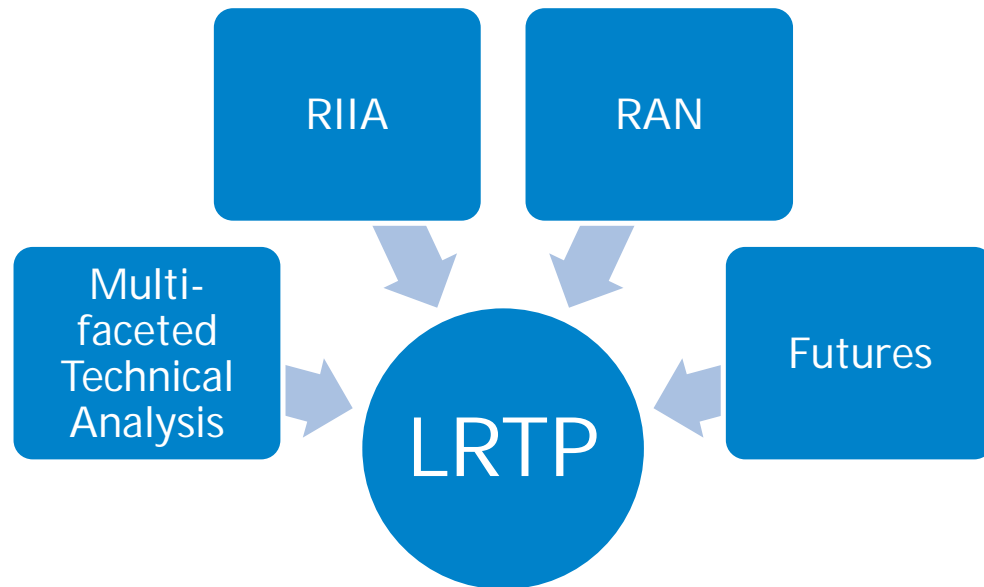
Sample Projects from MTEP20 – no Market Efficiency Projects were identified in MTEP20

Geographic Location	Project ID	Project Name	Trigger/Process	Allocation Type	Qualify as MEP?
Ameren IL	19045	New Rivian Load Interconnection	Local planning - Provide 2 138kV lines to support customer load addition	Other – Load Growth	No
Duke Energy IN	18284	345kV 3-breaker ring bus substation	GI process - 300 MW wind farm interconnection studied in DPP	GIP – 345kV Network Upgrades qualify for 10% postage stamp based on load ratio share.	No
Entergy-MS	19287	Webb 115 kV: Substation Expansion (J908)	GI process - This project will expand the 115 kV Webb substation to facilitate the generation interconnection project J908.	Generator Interconnection Project	No
METC	19545	Grand Rapids Area Project	Local planning – Identified need to rebuild Tallmadge Wealthy 138 kV lines (1 and 2).	Baseline Reliability Project	No
Entergy-TX	13864 MTEP17	Hartburg – Sabine 500KV	MCPS – 500kV line resolves identified congestion with >1.25 benefit-to-cost ratio	Market Efficiency Project	Yes

Long Range Transmission Plan (LRTP)

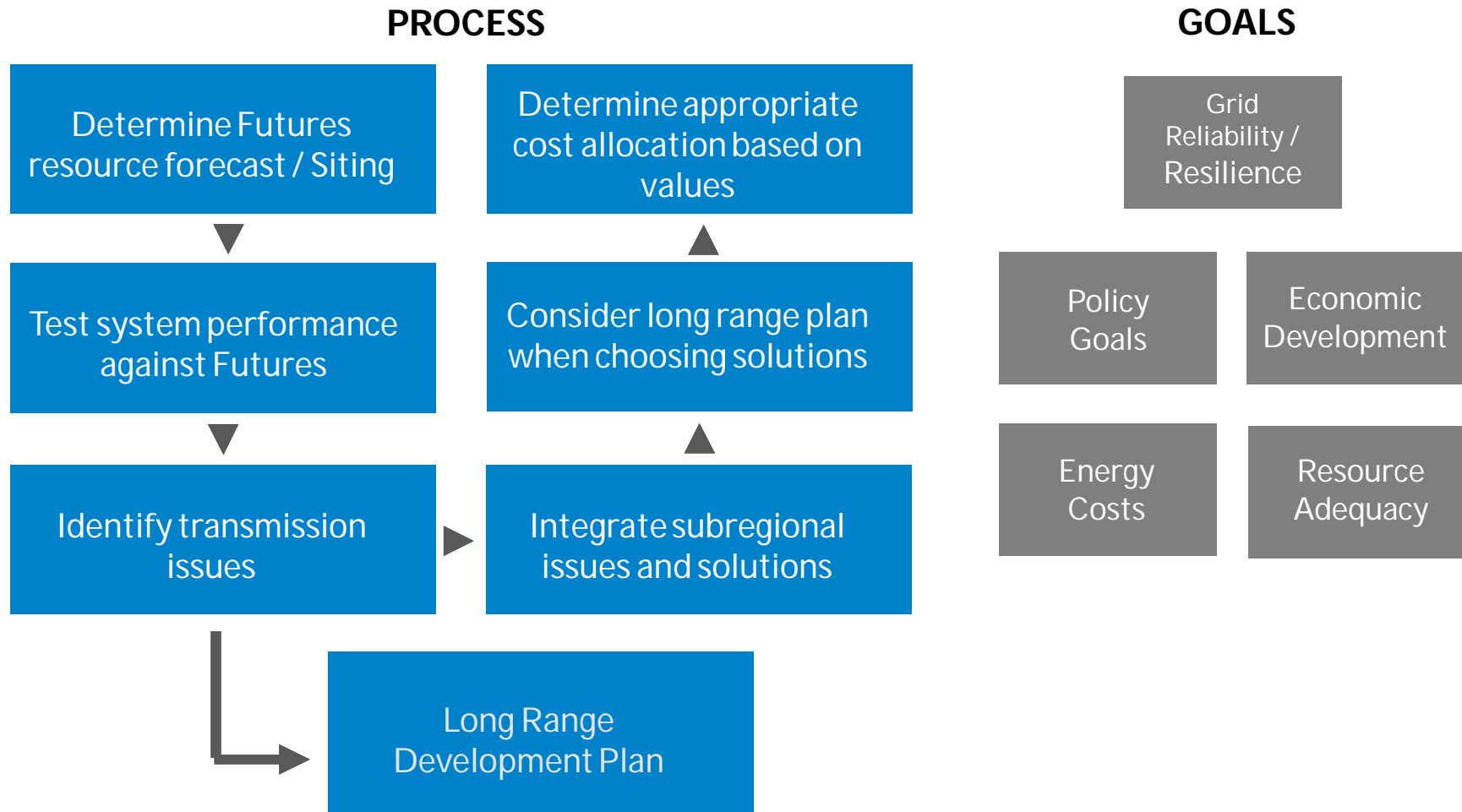
L RTP will be a comprehensive approach under MISO's Reliability Imperative to provide a transmission road map of grid evolution that will be the foundation to drive future investment decisions

L RTP will focus on several aspects of the grid – reliability, stability, robustness, resiliency, system diversity, economics, and challenges associated with operating the system with the changing fleet (as identified in RIIA and RAN)

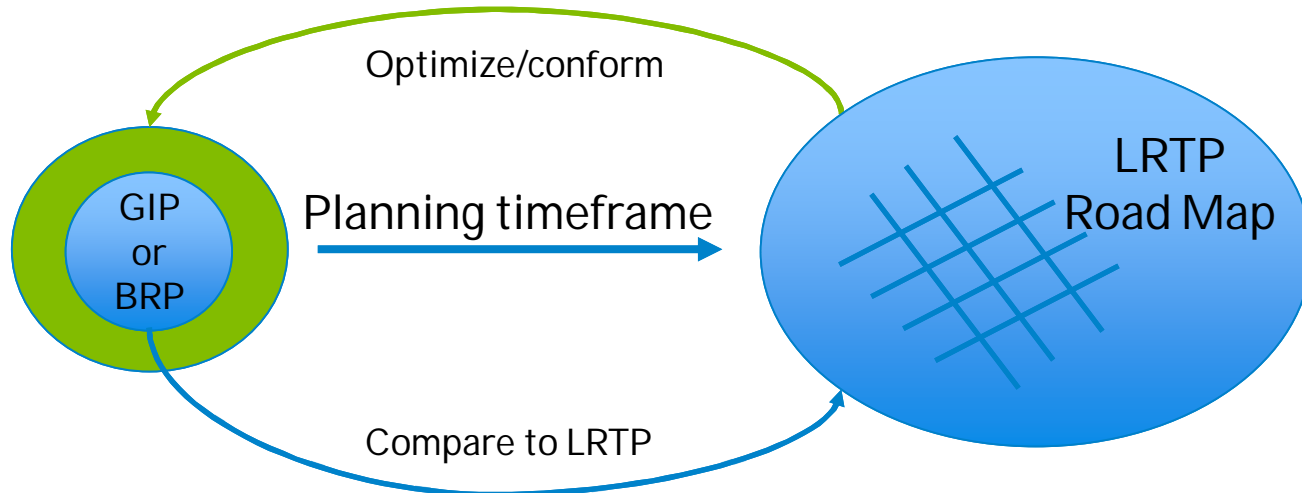


What is a Transmission Road Map?
MISO envisions this to be a foundational set of regional, subregional and interregional transmission projects that provide insight and direction for future investment

L RTP will utilize MISO's planning process which identifies grid needs based upon Futures, is multi-step, and considers subregional needs and solutions



The LRTP transmission road map will be adaptive to future changes in policy, generation build-out, market shifts, and will guide the optimization of near term needs for compatibility with long term drivers



- The transmission road map will serve as a guide to inform future investment as transmission needs mature
- Periodic re-evaluation of the transmission road map will support alignment with fleet transition and policy changes
- As transmission needs may change over time, so to will the transmission road map