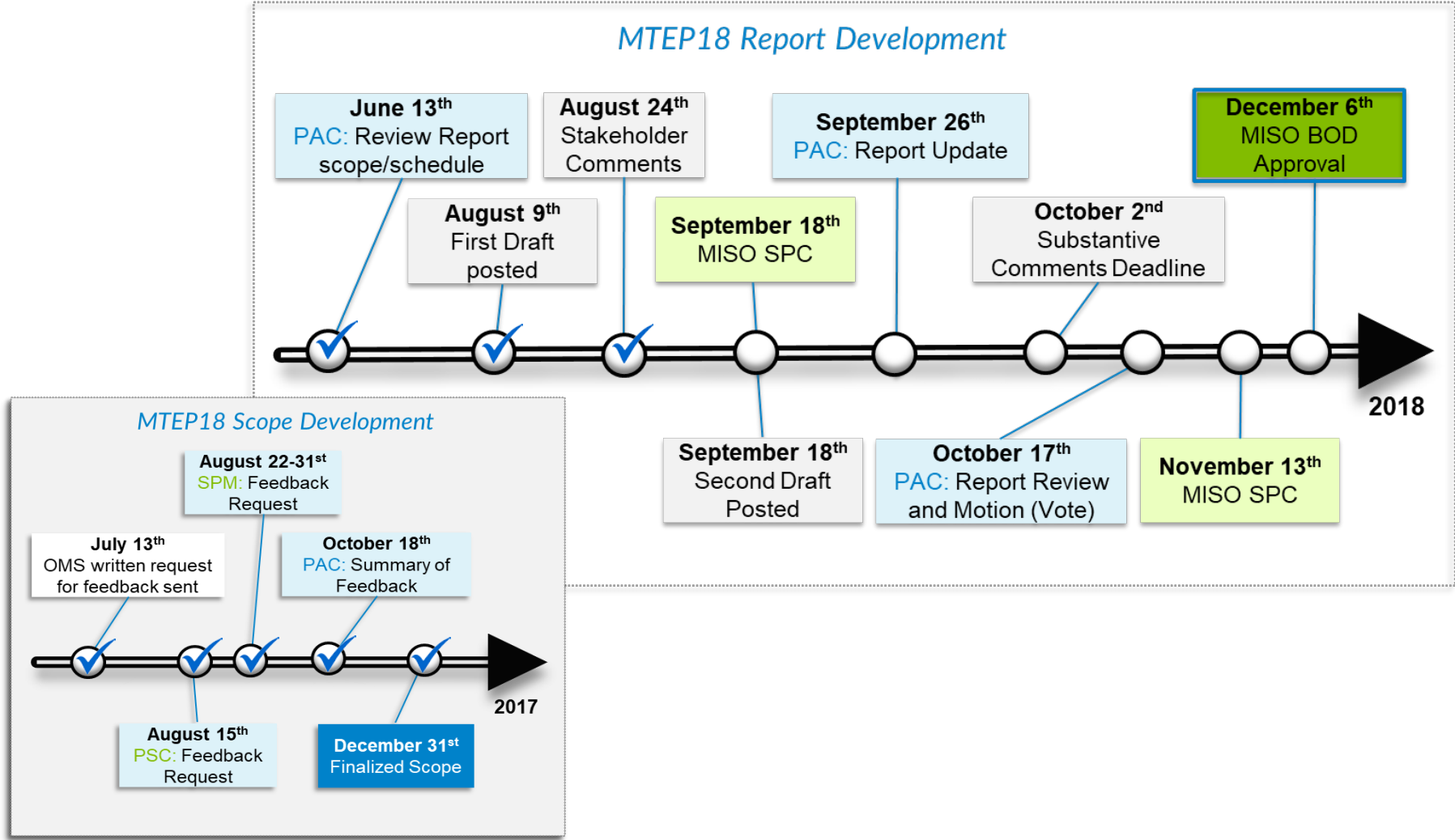




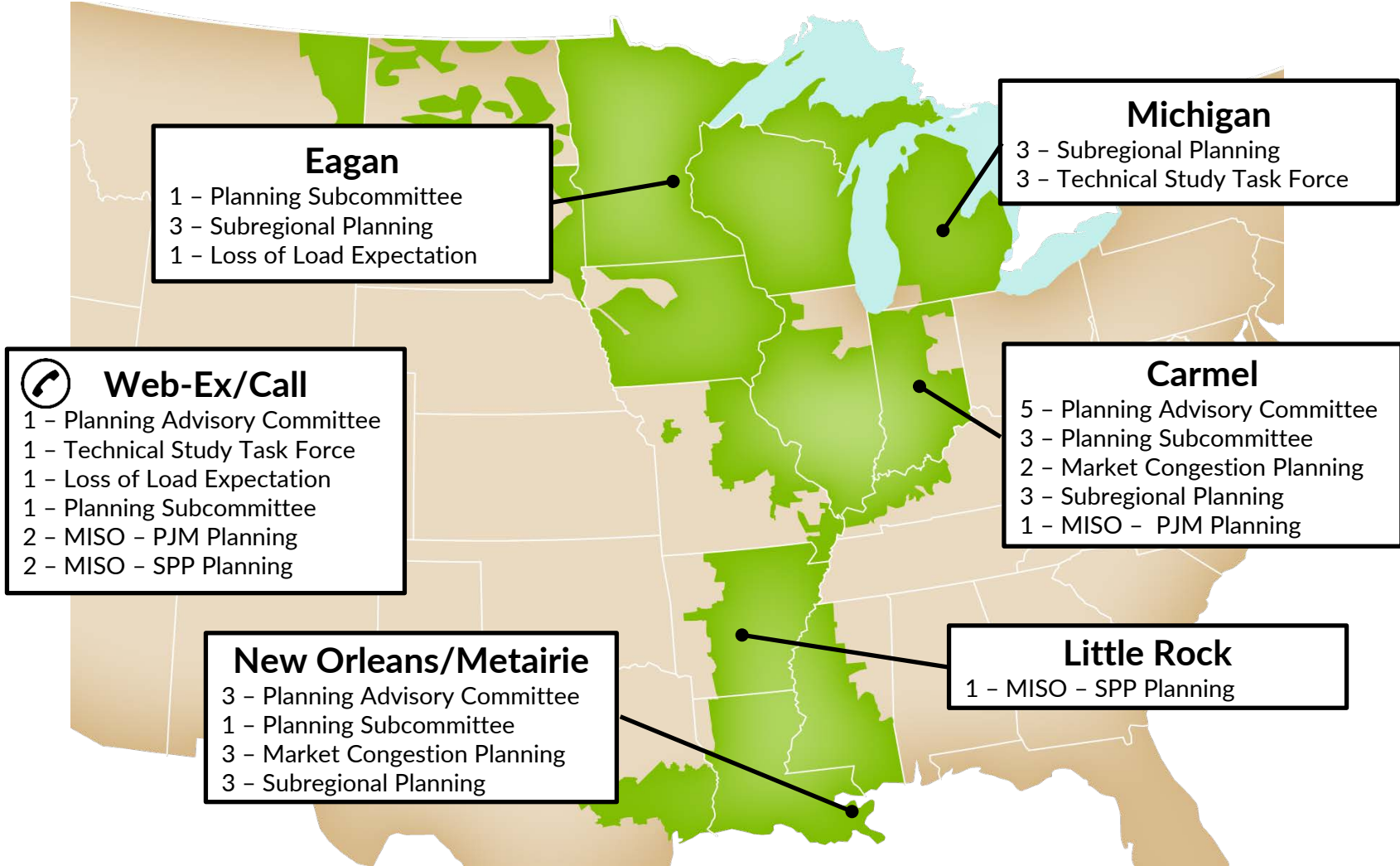
MTEP 2018 Review

System Planning Committee of
the Board of Directors
September 18, 2018

MTEP 2018 represents the cumulative efforts of collaboration between MISO staff and stakeholders.

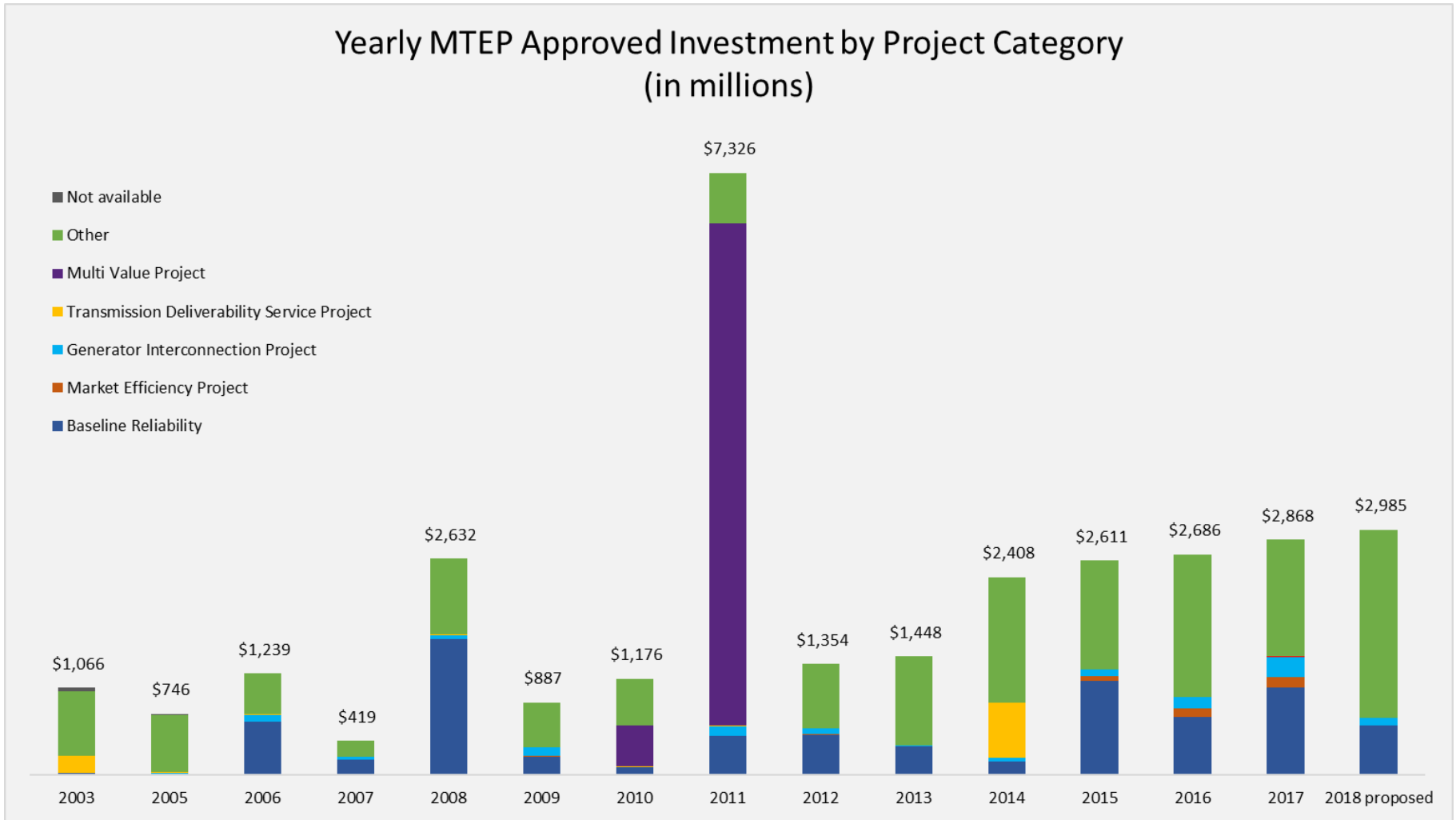


Stakeholders have been involved across the regions throughout the MTEP 2018 process.

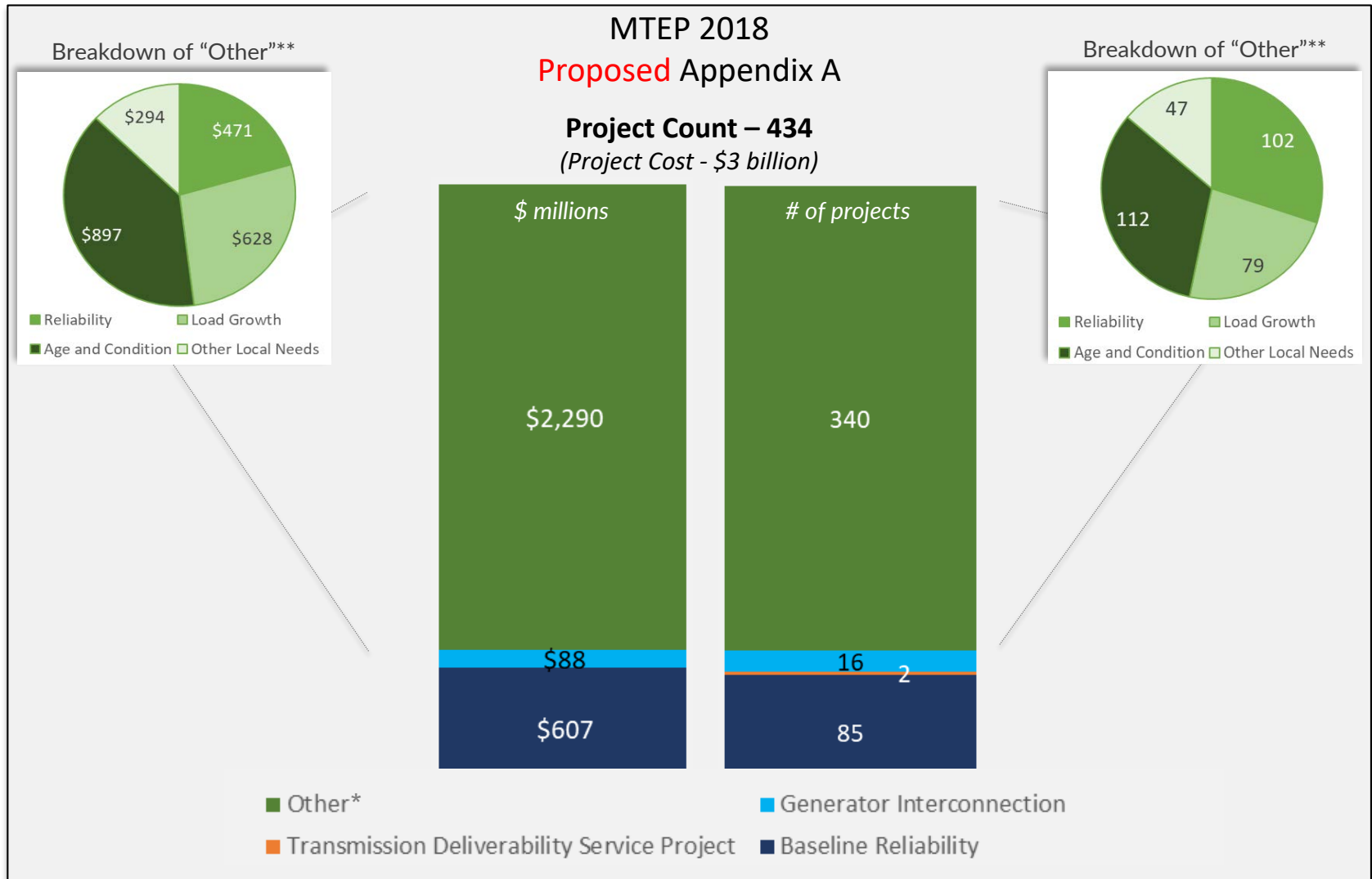


MTEP 2018 level of investment is consistent with prior years.

Yearly MTEP Approved Investment by Project Category (in millions)



434 new projects, at a cost of \$3 billion, will be recommended for approval in December in MTEP 2018.

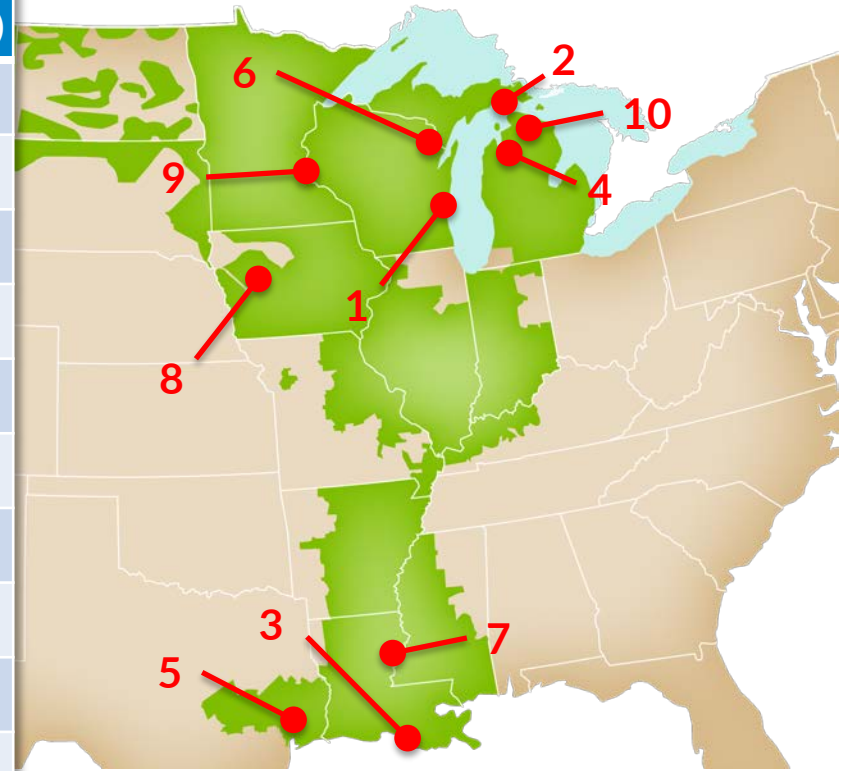


*Other = Projects based on local Transmission Owner needs including reliability, economics, equipment age and condition, environmental, etc.

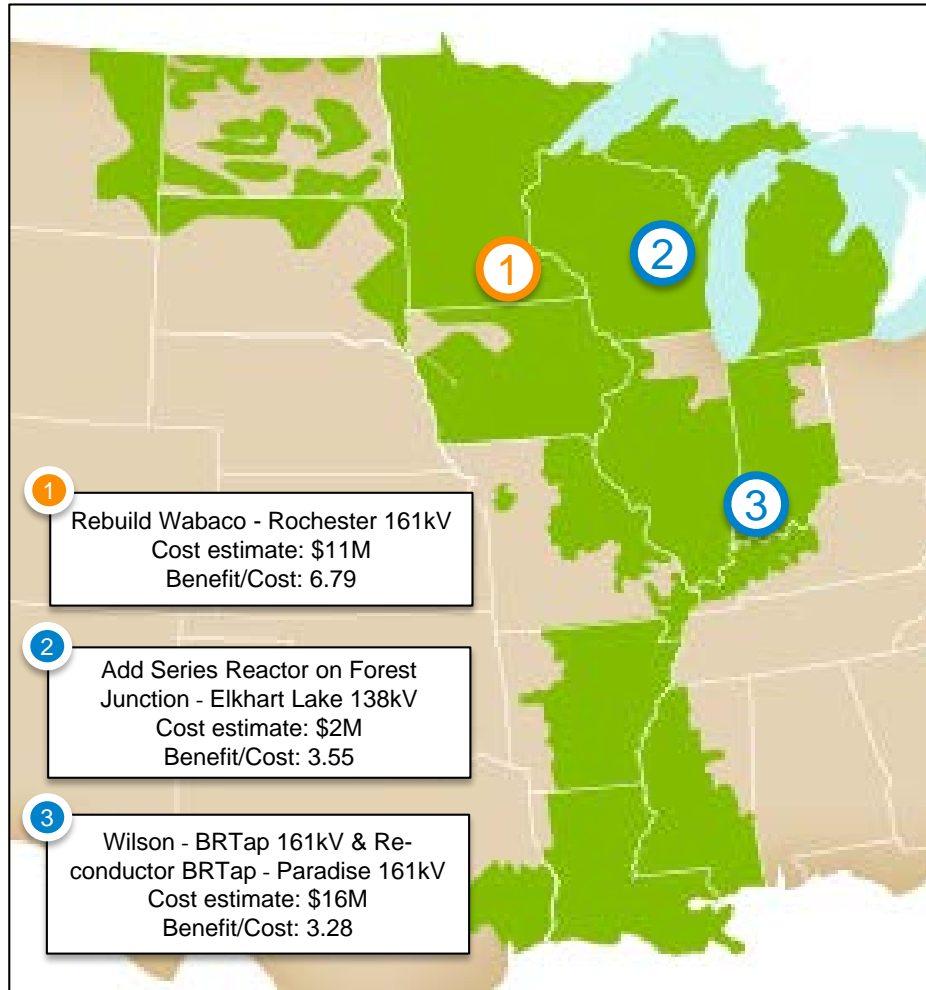
**Breakdown categories are informational only and do not indicate new project types for cost allocation.

The currently proposed top ten projects in MTEP 2018, based on cost, represent 24% of overall MTEP 2018 costs.

Rank	Project Name	Cost (Millions)
1	Mount Pleasant Tech Interconnection 345kV	\$140
2	Mackinac - Mc Gulpin 138kV	\$140
3	East ALP Project: Lake Peigneur - Celelia 230kV	\$72
4	Oden Area Support 69kV	\$66
5	Timberland 230kV	\$53
6	Bayport - Pioneer Rebuild 138kV	\$52
7	Natchez SES - Red Gum Rebuild 115kV	\$50
8	Raccoon Trail Substation 345kV	\$50
9	Plymouth - Area Power Upgrade 115kV	\$42
10	Riggsville - Vanderbilt 138kV Rebuild	\$42

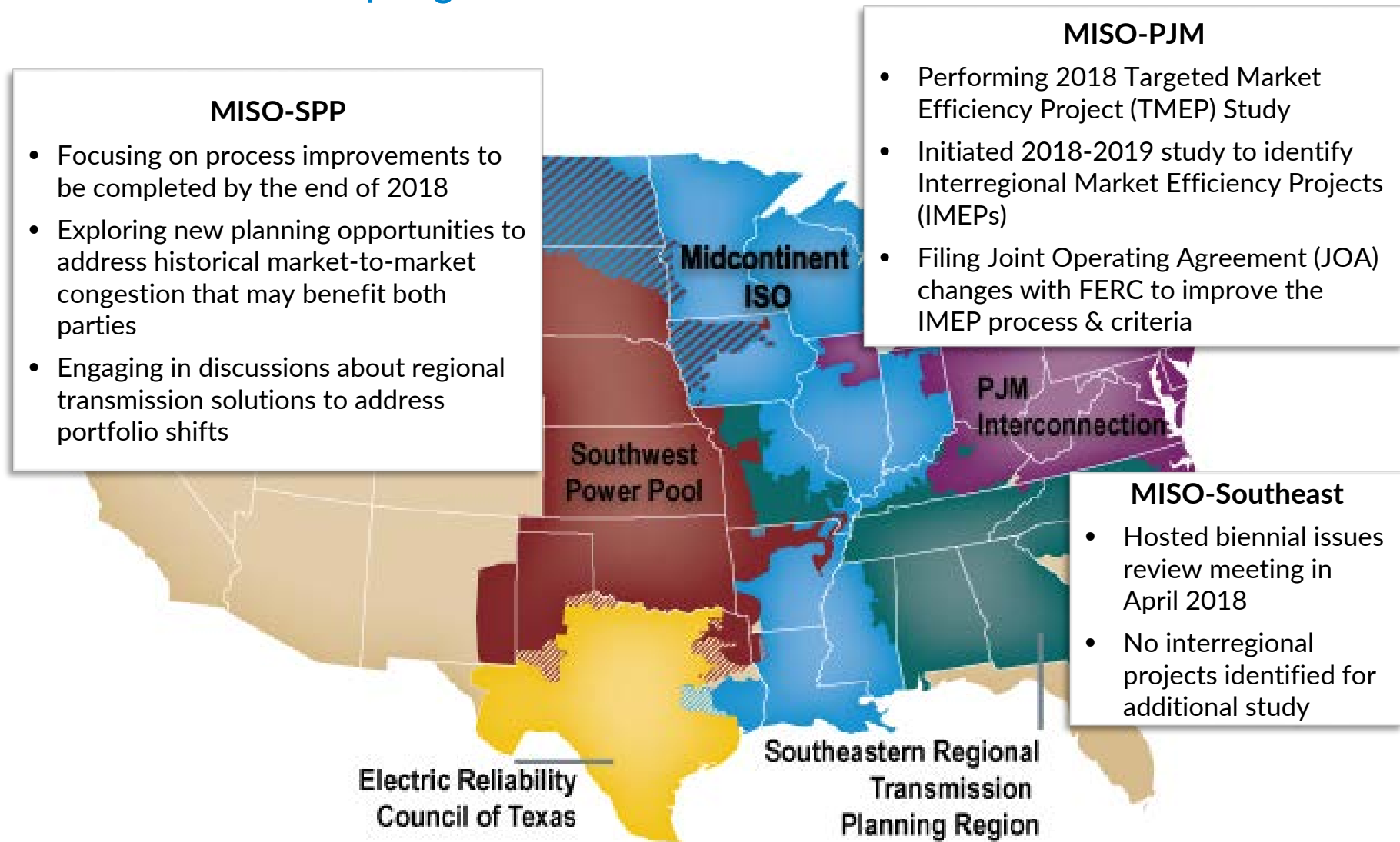


Market Congestion Planning Studies identified 3 economic other projects.



- Three projects are robust transmission solutions under the scenarios evaluated.
 - Project 1 is pending the evaluation process that includes stakeholder feedback.
 - Projects 2 and 3 are ready to move forward as MTEP18 Economic Other projects for approval.
- None of the projects meet the voltage threshold to be eligible as a Market Efficiency Project (MEP).

Interregional transmission planning and coordination activities continue to make progress in 2018.



MISO and PJM are in the final stage of determining potential Targeted Market Efficiency Projects to address historical seams congestion.

Monitored Branches for Further Study	
Westwood 345/138kV BK1	Todd Hunter 345/138kV
Cherry Valley 345/138kV TR82	Nelson 345/138kV TR82
Shadelnd - Lafaysouth 138kV	Dumont - Stillwell 345kV
Gibson - Petersburg 345kV	Zion 974 - Pleasant Prairie 345kV
Zion 22 - Pleasant Prairie 345kV	Brokaw - Leroy 138kV
Braidwood - E. Frankfort 345kV	Garden Plain - 15518 138kV
Dune Acre - Michigan City 138kV	Michigan City - Trail Creek 138kV
Zion 22 - Zion 974 345kV	NW Tap - Purdue 138kV
Dresden 345/138kV TR83	Leesburg - Northeast 138kV
Newton 345/138kV	



Study Timeline



Annual extreme event assessments are performed to evaluate potential system impacts of low frequency, high impact events.



ANTICIPATE...

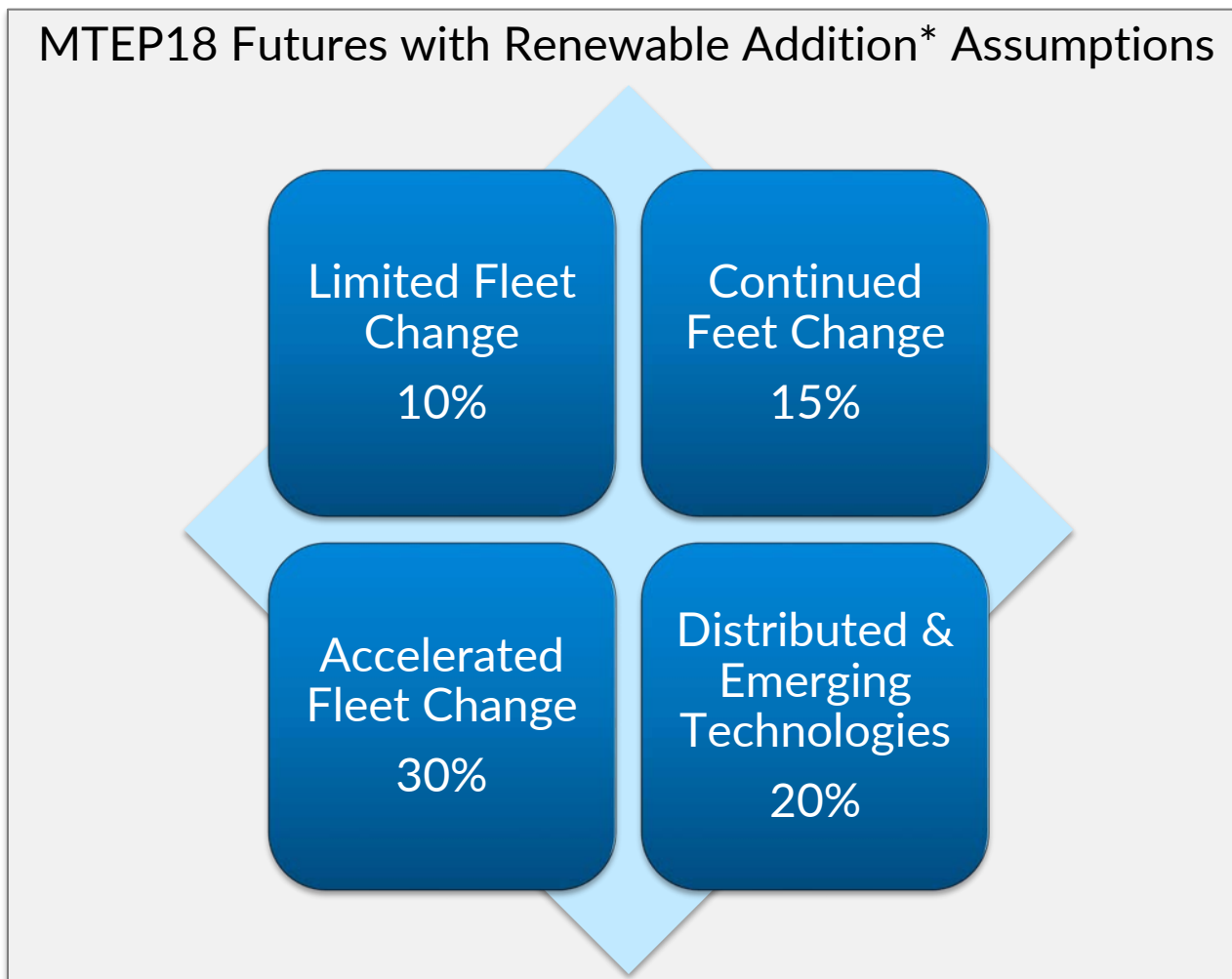
~ 6,500 extreme events analyzed
(including major gas pipeline disruptions)

- Gas pipeline contingencies evaluated do not present an imminent reliability risk.
- A small, but not trivial, number of extreme events cause potential cascading failures; some with significant load loss at risk.

PREPARE...

Assessment results are shared with stakeholders to ensure situational awareness.

MISO, in coordination with stakeholders, updated the MTEP18 Futures and added a fourth Distributed Emerging Technologies future to consider emerging technology trends.

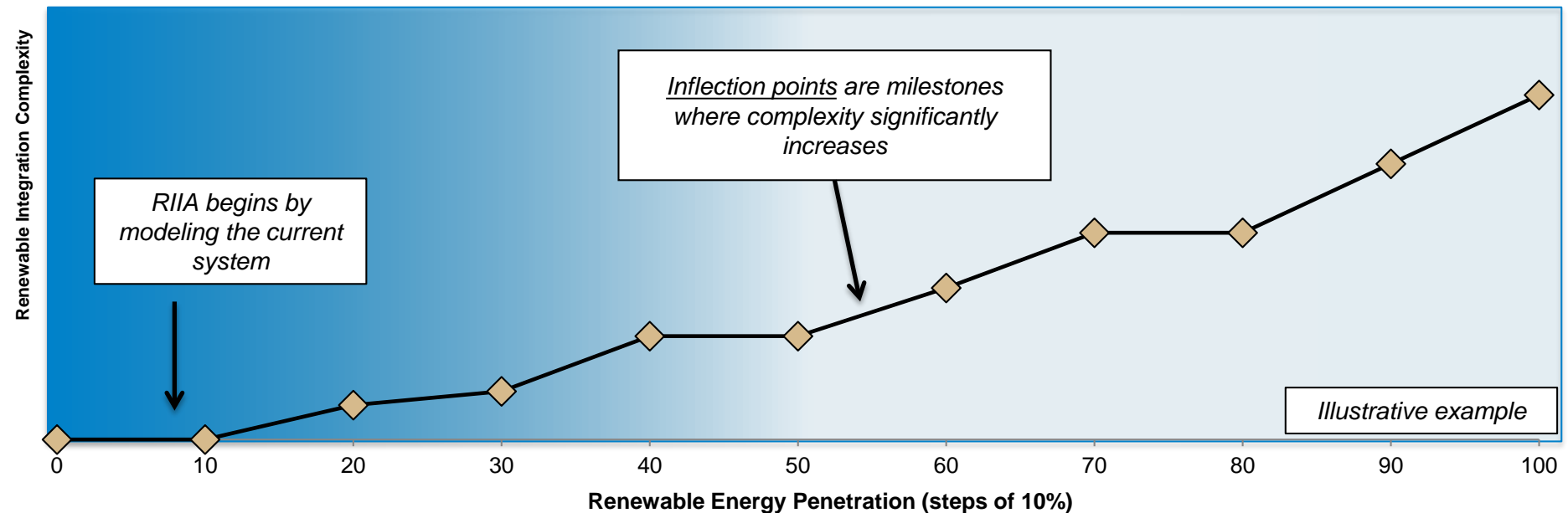


Studies like the Renewable Integration Impact Assessment (RIIA) are important to understand the impacts of increased renewable penetration on Markets, Reliability, Operations Tools and Transmission.



Focus Areas:

- Resource Adequacy
- Energy Adequacy
- Operating Reliability



Appendix

MTEP 2018 Project Highlights

Rank	Project Name	ID	Cost (Millions)	Type	Driver
1	Mount Pleasant Tech Interconnection 345kV	14073	\$140	Other	Distribution
2	Mackinac – Mc Gulpin 138kV	15145	\$140	Other	Reliability
3	East ALP Project	12101	\$72	Base Reliability	Reliability
4	Oden Area Support 69kV	13581	\$66	Other	Reliability
5	Timberland 230kV	12767	\$53	Other	Reliability
6	Bayport – Pioneer Rebuild 138kV	14706	\$52	Other	Reliability
7	Natchez SES – Red Gum Rebuild 115kV	13867	\$50	Base Reliability	Reliability
8	Raccoon Trail Substation 345kV	13901	\$50	Other	Distribution
9	Plymouth-Area Power Upgrade	14054	\$42	Base Reliability	Reliability
10	Riggsville – Vanderbilt 138kV Rebuild	13872	\$42	Other	Reliability