



# Reliability Imperative: Long Range Transmission Planning

System Planning Committee of  
the Board of Directors

June 30, 2022

# Executive Summary



- Management requests the System Planning Committee recommend approval by the Board of Directors of the MTEP21 Report Addendum: Long Range Transmission Planning Tranche 1 Portfolio
- This portfolio, which includes 18 projects in MISO's Midwest Subregion, totals \$10.3B in investment, supports system reliability and provides benefits in excess of costs
- Stakeholders provided substantive feedback that shared support for Tranche 1 approval along with various suggestions for process and analytical improvement

# As part of MISO's Reliability Imperative, Long Range Transmission Planning provides orderly and timely regional transmission expansion given the changing resource portfolio

## Reliable System



Maintain robust and reliable performance in future conditions with greater uncertainty and variability in supply

## Cost Efficient



Enable access to lower-cost energy production

## Accessible Resources



Provide cost-effective solutions allowing the future resource fleet to serve load across the footprint

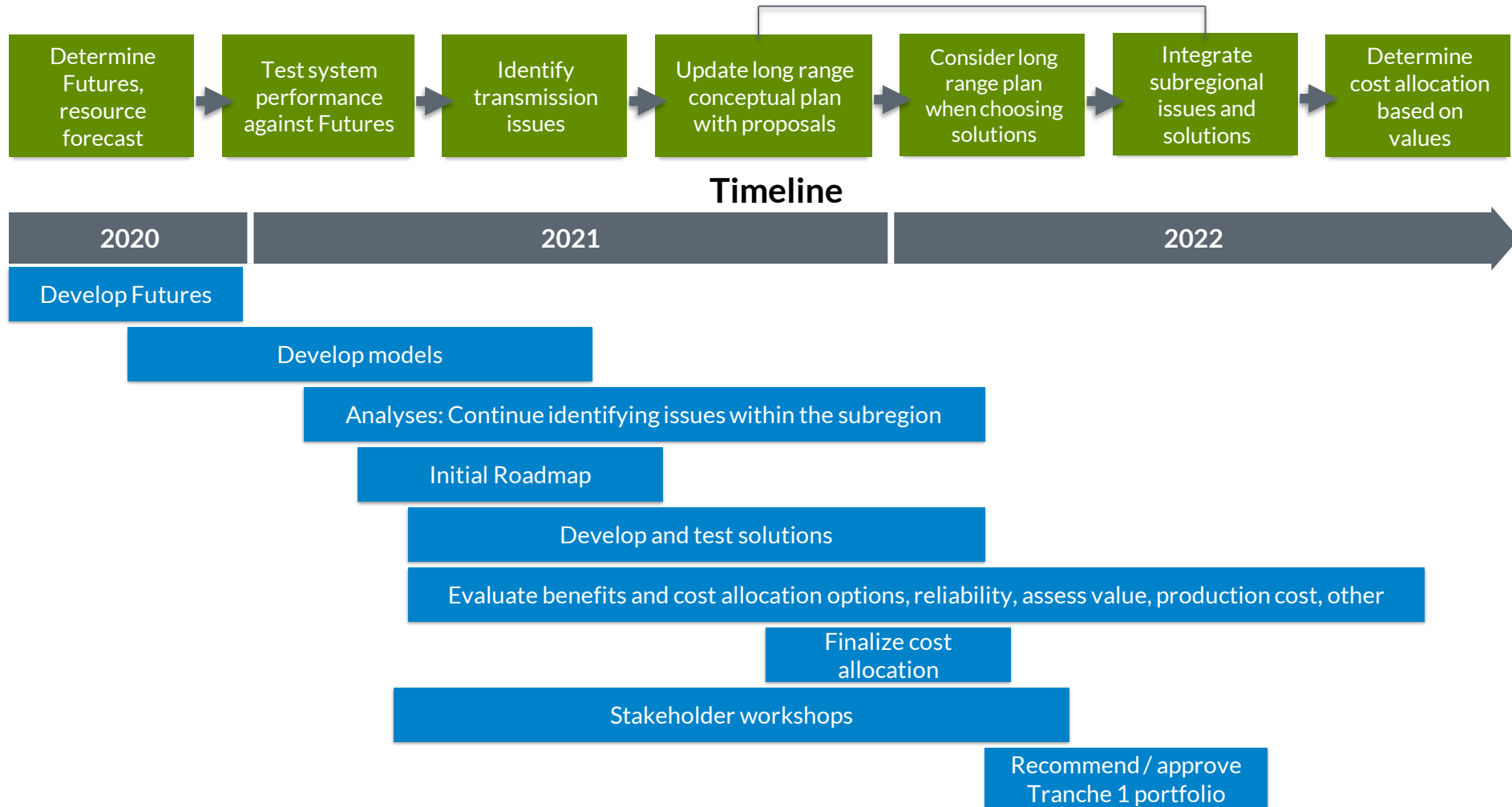
## Flexible Resources



Allow more flexibility in the fuel mix for customer choice

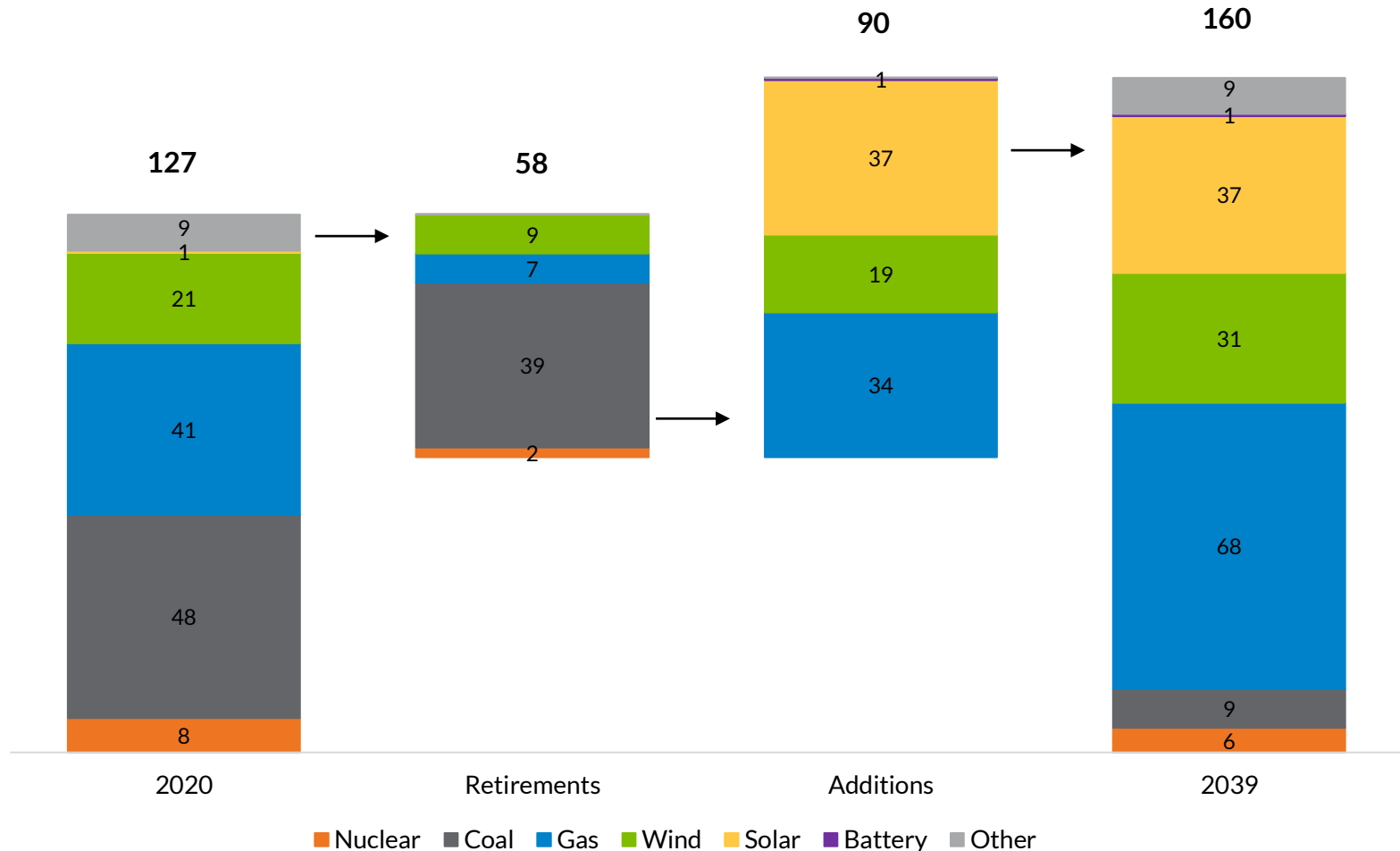
# Tranche 1, the first set of Long Range Transmission Planning projects, is the culmination of more than two years of planning activities

## Long Range Transmission Planning Process



Tranche 1 provides a set of “least regrets” solutions focused on meeting portfolio changes of members and states as contemplated by Future 1

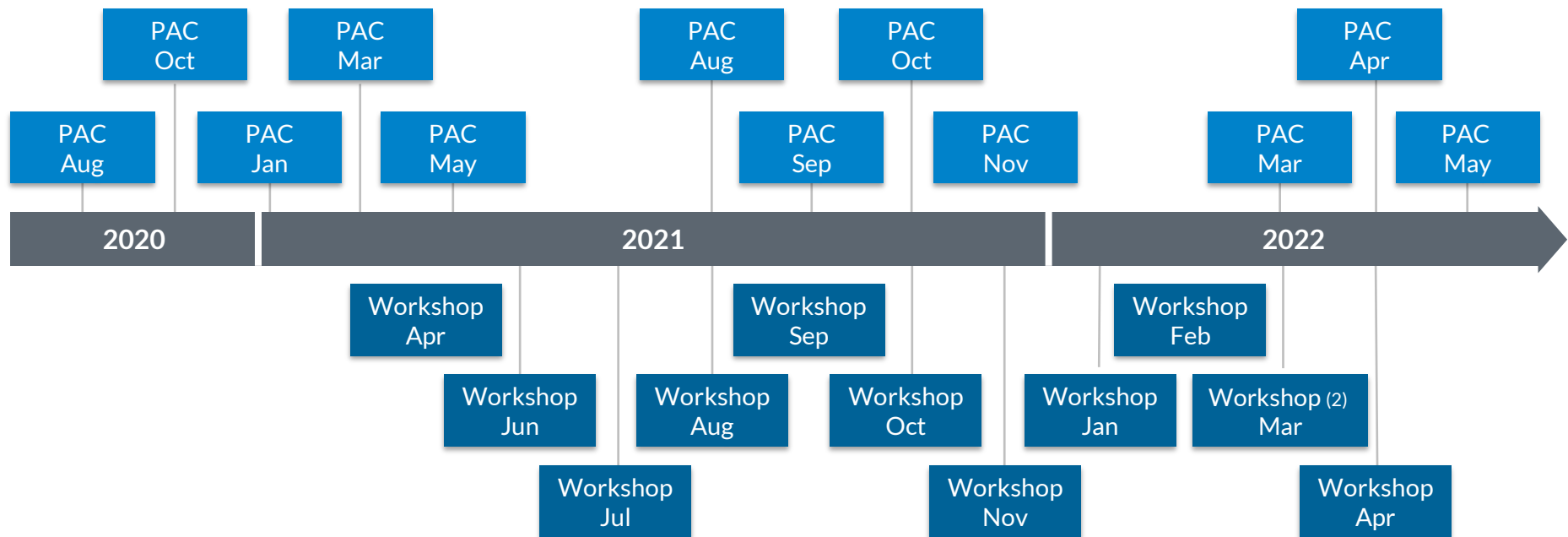
### Future 1 - MISO Midwest Generation Capacity (GW)



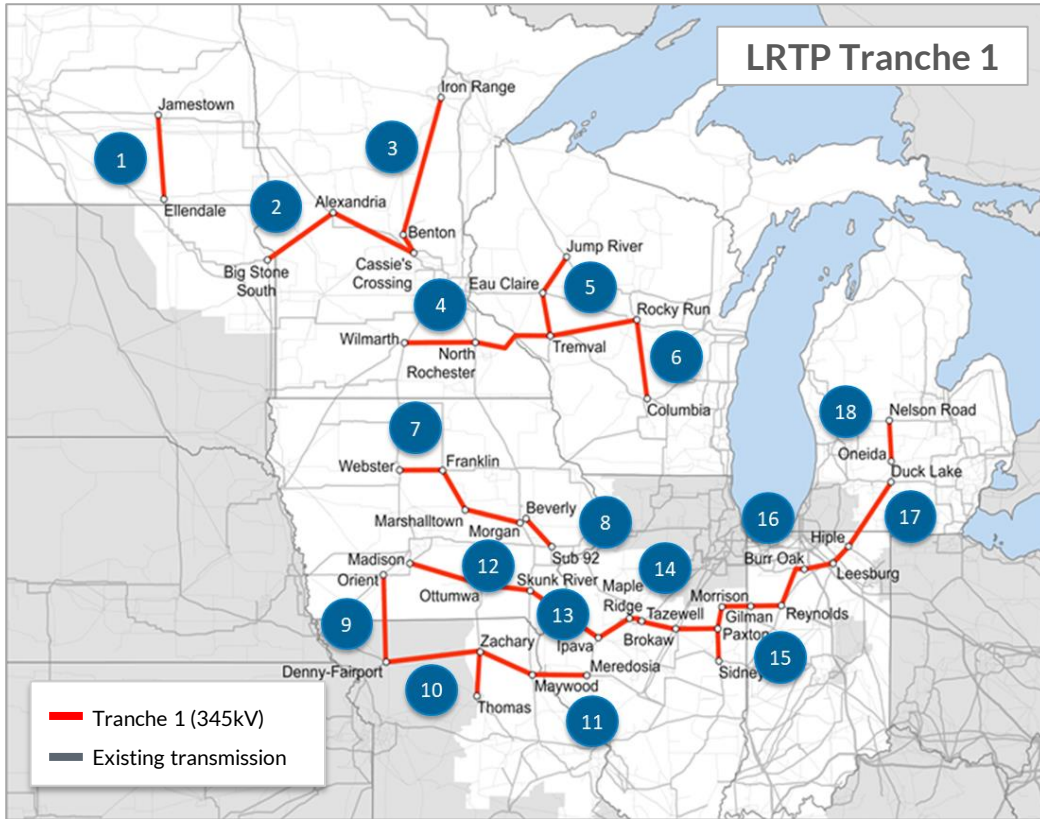
# Stakeholder input has been critical and numerous meetings have provided opportunities for strong engagement throughout the process

Tranche 1 is the culmination of approximately:

 200+ internal and external meetings       200 - 300 attendees at each external meeting and workshop



# Tranche 1 represents the first iteration and includes 18 projects across the MISO Midwest subregion estimated at \$10.3 billion



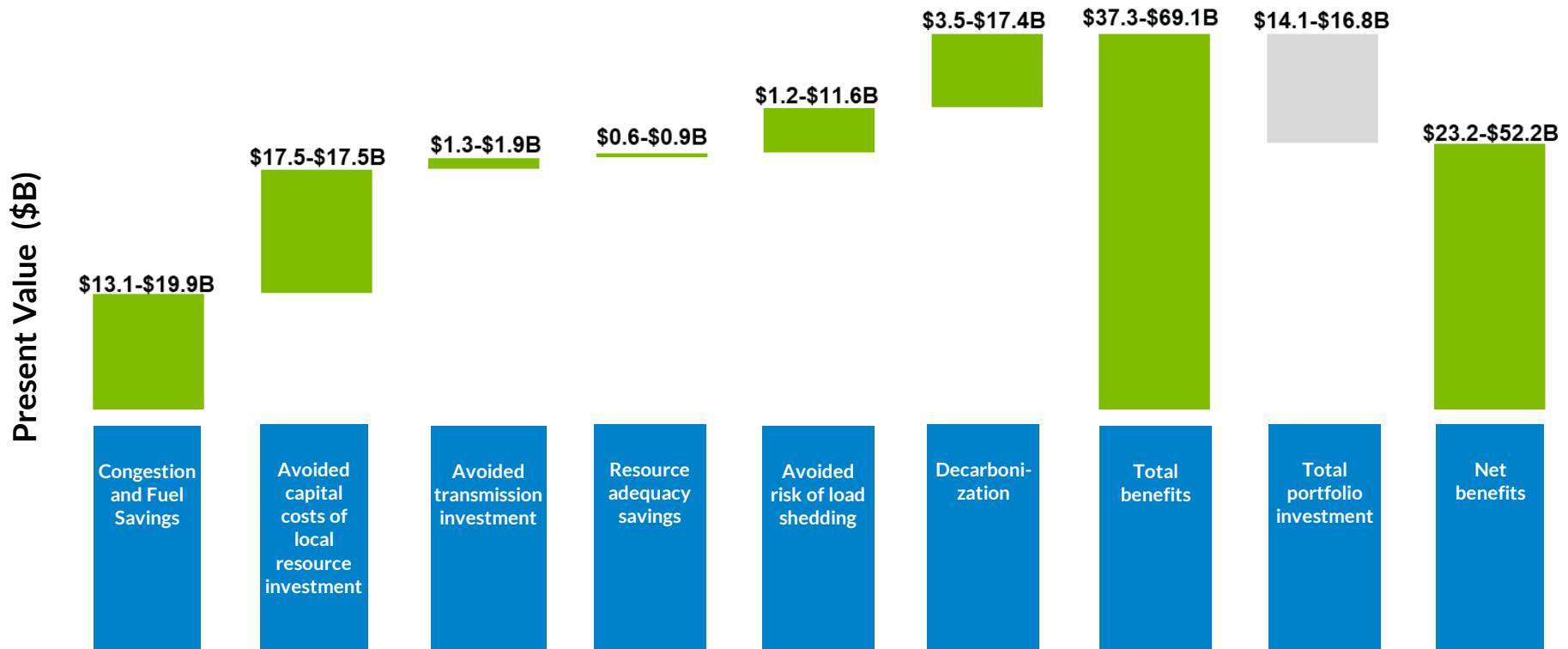
Assumption on all in-service dates is by 2030

ID	Project Description	Est. Cost (\$M, 2022)
1	Jamestown - Ellendale	\$439M
2	Big Stone South - Alexandria - Cassie's Crossing	\$574M
3	Iron Range - Benton County - Cassie's Crossing	\$970M
4	Wilmarth - North Rochester - Tremval	\$689M
5	Tremval - Eau Clair - Jump River	\$505M
6	Tremval - Rocky Run - Columbia	\$1,050M
7	Webster - Franklin - Marshalltown - Morgan Valley	\$755M
8	Beverly - Sub 92	\$231M
9	Orient - Denny - Fairport	\$390M
10	Denny - Zachary - Thomas Hill - Maywood	\$769M
11	Maywood - Meredosia	\$301M
12	Madison - Ottumwa - Skunk River	\$673M
13	Skunk River - Ipava	\$594M
14	Ipava - Maple Ridge - Tazewell - Brokaw - Paxton East	\$572M
15	Sidney - Paxson East - Gilman South - Morrison Ditch	\$454M
16	Morrison Ditch - Reynolds - Burr Oak - Leesburg - Hiple	\$261M
17	Hiple - Duck Lake	\$696M
18	Oneida - Nelson Rd.	\$403M
<b>Total Project Portfolio Cost</b>		<b>\$10.3B</b>

# Current analysis indicates total economic benefits of the Tranche 1 portfolio significantly exceed costs

## L RTP Tranche 1 Benefits vs. Costs 20 – 40-Year Present Value (2022 \$B)

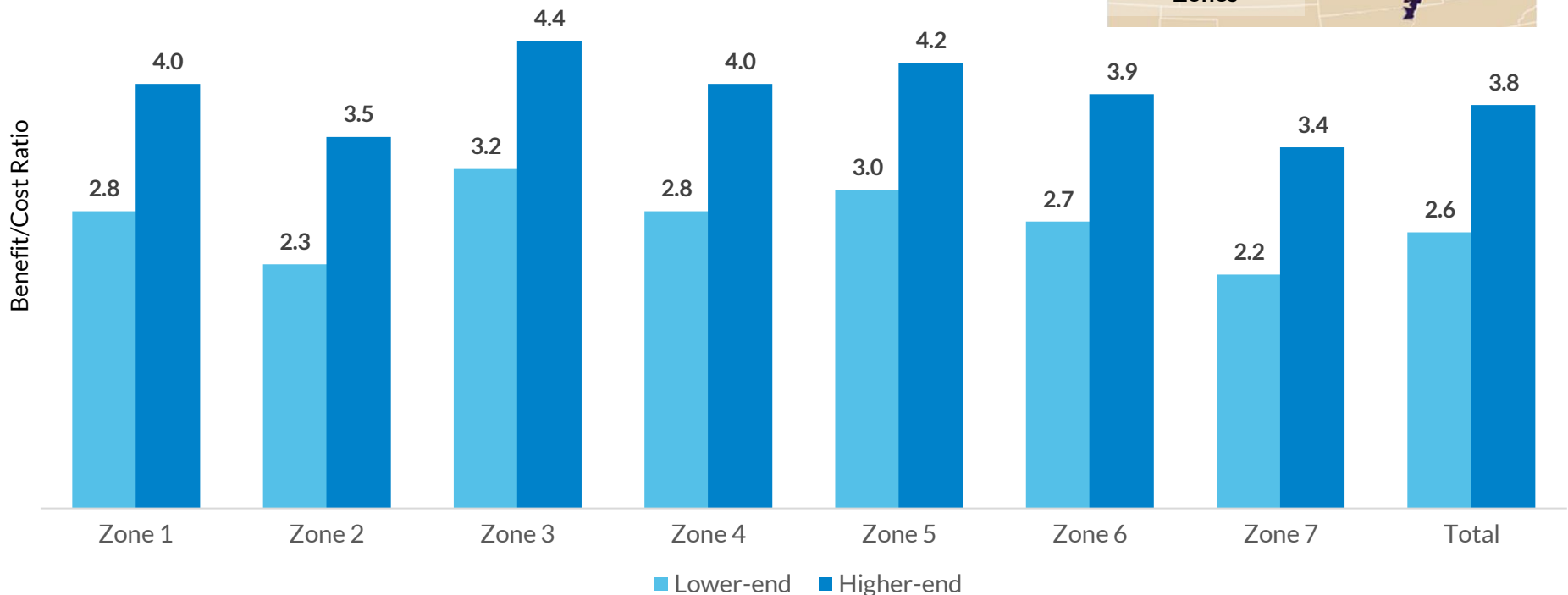
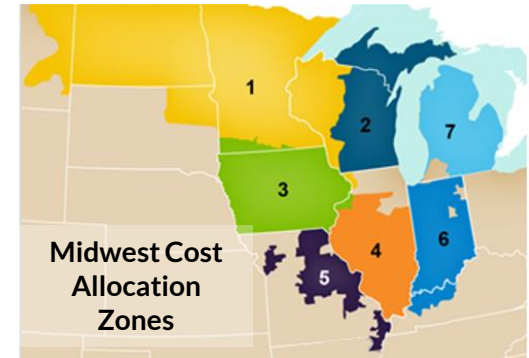
Calculations are generally based on conservative assumptions including the analysis period and discount rate





# Benefits will be broadly distributed across the Midwest subregion and deliver a benefit to cost ratio of at least 2.2 for all zones

**Range of Benefit/Cost Ratio by Cost Allocation Zone**  
(20-year present value, 6.9% Discount Rate)



# MISO received 15 substantive feedback submissions from the following sectors and stakeholders

Stakeholder comments	MISO response
<p><b>Support for Tranche 1 approval recommendation</b></p>	<p>MISO staff appreciates these comments and support of the MTEP21 Addendum and LRTP process for the Tranche 1 portfolio.</p>
<p><b>Benefit Metric Calculations</b></p> <p>Some comments expressed concerns about potential overstating of benefits as a result of the methods used to calculate the various benefit metrics. These concerns generally focused on two areas:</p> <ol style="list-style-type: none"> <li>1. Differences in reference cases (i.e., cases without LRTP transmission)</li> <li>2. Avoided Risk of Load Shedding benefit</li> </ol>	<p>In developing the business case for Tranche 1, MISO used conservative methods to quantify multiple types of benefits related to the needs captured in Future 1. MISO discussed these methods extensively in multiple workshops, and stakeholders broadly agreed with the types of benefits captured:</p> <ol style="list-style-type: none"> <li>1. Differences in reference cases were used to highlight the difference in benefits of resource construction (Avoided Capital Costs) and deliverability (Congestion and Fuel Savings, Decarbonization)</li> <li>2. Avoided Risk of Load Shedding benefits captures the mitigation of risks in alignment with NERC planning standards, focusing on risk reduction rather than probability</li> </ol>
<p><b>Additional feedback</b></p> <p>Stakeholder feedback reflected a wide array of topics: Alternative solutions; details on specific information shared and the timeliness of making modeling data available; sequencing of projects; and challenges with understanding the vast amounts of study data</p>	<p>MISO appreciates all the feedback and responded to each individual comment. MISO did not see any comments which diminish our confidence that the Tranche 1 Portfolio provides significant reliability and economic value, or any alternatives that would need to be considered further prior to our recommendation of the portfolio for approval by the MISO Board.</p>

## Planning Advisory Committee Sector members voted to approve the following motion on June 6

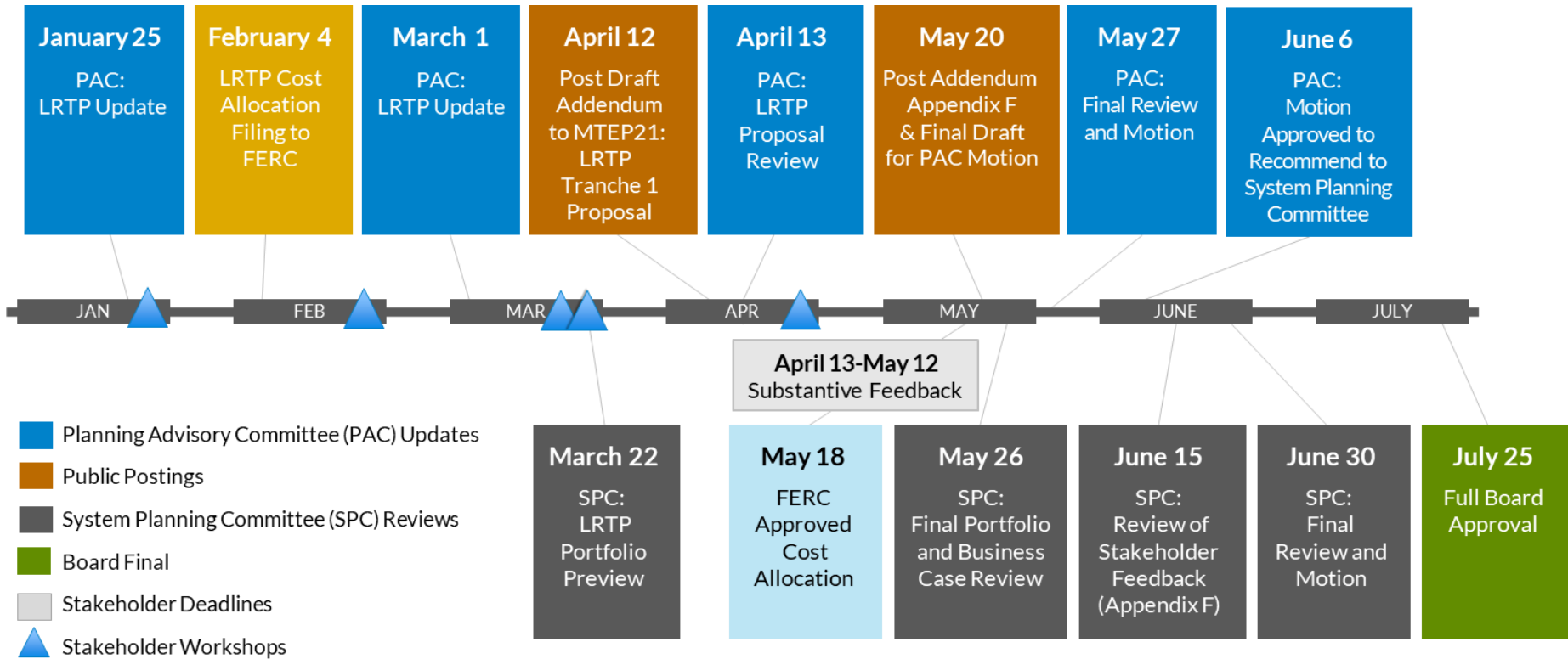
“The Planning Advisory Committee (PAC) sectors have reviewed and discussed the draft MTEP21 Report Addendum: Long Range Transmission Planning (LRTP) Tranche 1 Portfolio that MISO will send to the Advisory Committee (AC) and MISO Board of Directors for approval in July 2022. The PAC sectors and MISO stakeholders have provided written comments and suggestions for improvement of MISO’s planning activities to be included in future planning processes. The PAC recommends that the MTEP21 Report Addendum proceed to the System Planning Committee of the Board of Directors for consideration.”

7 votes in favor, 1 vote opposed, 2 abstentions

## MISO staff requests a recommendation of approval by the System Planning Committee

“The System Planning Committee recommends to the Board that it approve the 18 projects in the MTEP21 Report Addendum: Long Range Transmission Planning Tranche 1 Portfolio Report and also approve the inclusion of the 18 projects into Appendix A of MTEP 2021.”

# The timeline for approval of Tranche 1 is targeted for July 25



# Appendix

# Substantive Stakeholder Feedback Summary and MISO Response

# MISO received 15 substantive feedback submissions from the following sectors and stakeholders

- Ameren
- Certain MISO TOs:
  - Ameren Missouri
  - Ameren Illinois
  - Ameren Transmission Company of Illinois
  - ITC Transmission
  - ITC Midwest LLC
  - Michigan Electric Transmission Company, LLC
  - MidAmerican Energy Company
  - Northern States Power MN (subsidiary of Xcel Energy Inc.)
  - Northern States Power WI (subsidiary of Xcel Energy Inc.)
  - Otter Tail Power Company
- DTE Energy
- Eligible End Use Customers Sector
- Environmental Sector
- Invenergy, LLC
- Iowa Office of Consumer Advocate
- ITC Companies
- MidAmerican Energy Company
- MISO South TOs:
  - Arkansas Electric Cooperative Corporation
  - Cleco Power, LLC
  - Cooperative Energy
  - Entergy Arkansas, LLC
  - Entergy Louisiana, LLC
  - Entergy Mississippi, LLC
  - Entergy New Orleans, LLC
  - Entergy Texas
- Missouri River Energy Services
- Municipals/Cooperatives/Transmission Dependent Utilities (TDU) Sector
- National Grid Renewables
- Otter Tail Power Company
- WPPI Energy



# Several entities provided comments in support of the Tranche 1 Portfolio\*

Stakeholder comments	MISO response
<p><b>Support for Tranche 1 approval recommendation</b></p> <p>The following MISO Stakeholders submitted substantive feedback outlining support of the LRTP Tranche 1 Portfolio of projects:</p> <ul style="list-style-type: none"><li>• Ameren</li><li>• Environmental Sector</li><li>• ITC Companies</li><li>• MidAmerican Energy Company</li><li>• Otter Tail Power Company</li><li>• Municipals/Cooperatives/Transmission Dependent Utilities Sector</li><li>• Certain MISO TOs:<ul style="list-style-type: none"><li>• ITC Transmission</li><li>• Michigan Electric LLC</li><li>• ITC Midwest LLC</li><li>• Otter Tail Power Company</li><li>• MidAmerican Energy Company</li><li>• Ameren Missouri</li><li>• Ameren Illinois</li><li>• Ameren Transmission Company of Illinois</li><li>• Northern States Power MN (subsidiary of Xcel Energy Inc.)</li><li>• Northern States Power WI (subsidiary of Xcel Energy Inc.)</li></ul></li></ul>	<p>MISO staff appreciates these comments and support of the MTEP21 Addendum and LRTP process for the Tranche 1 portfolio.</p>

# Some comments raised concerns with the details of the benefit calculations, with general support for the benefit categories\*

Stakeholder Comments	MISO Response
<p><b>Benefit Metric Calculations</b></p> <p>Some comments expressed concerns about potential overstating of benefits as a result of the methods used to calculate the various benefit metrics. These concerns generally focused on two areas:</p> <ol style="list-style-type: none"><li>1. Differences in reference cases (i.e., cases without LRTP transmission)</li><li>2. Avoided Risk of Load Shedding benefit</li></ol> <p>Such comments were submitted by:</p> <ul style="list-style-type: none"><li>• Municipals/Cooperatives/Transmission Dependent Utilities (TDU) Sector</li><li>• Eligible End Use Customer Sector</li><li>• MISO South TOs</li></ul>	<p>In developing the business case for Tranche 1, MISO used conservative methods to quantify multiple types of benefits related to the needs captured in Future 1.</p> <p>MISO discussed these methods extensively in multiple workshops, and stakeholders broadly agreed with the types of benefits captured. Specifically:</p> <ol style="list-style-type: none"><li>1. Differences in reference cases were used to highlight the difference in benefits of resource construction (Avoided Capital Costs) and deliverability (Congestion and Fuel Savings, Decarbonization)</li><li>2. Avoided Risk of Load Shedding benefits captures the mitigation of risks in alignment with NERC planning standards, focusing on risk reduction rather than probability</li></ol>

## Additional stakeholder feedback reflected a wide array of topics\*

- Potential process enhancements for future LRTP studies
  - Creation and use of Future scenarios
  - Updates to the MVP subregional cost allocation method
  - Improved timeliness of model delivery, accessibility of results, and processes for alternative solicitation
  - Increased emphasis on various benefits (e.g., reliability, decarbonization)
- Specific projects or alternatives that should have been considered in Tranche 1
- Requests for additional detail on lower voltage (e.g., underbuild) facilities, costs, and in service dates
- Questions around sequencing of projects and impacts on near term congestion
- Areas for clarification in the report