Tranche 2: Initial Draft Portfolio

LRTP Workshop

March 4, 2024

Executive Summary

- As part of the Reliability Imperative, MISO's Transmission Evolution efforts are addressing the complexities of grid transformation with urgency, and LRTP Tranche 2 is a critical part of this evolution
- The solutions in the initial Tranche 2 draft portfolio represent key anticipated lines to resolve issues identified in Future 2A; alternatives assessment and business case analysis will inform the development of the final portfolio
- To meet changing resource needs and projected load increases for the MISO Midwest region, the final portfolio will enable a reliable and efficient transmission system while minimizing land use through a focus on 765 kV transmission

The Long Range Transmission Planning (LRTP) process aims to produce a robust, least-cost approach to meet the transmission needs of an evolving system

Step 1 **-** Through a rigorous stakeholder process, update Futures for resource mix and load

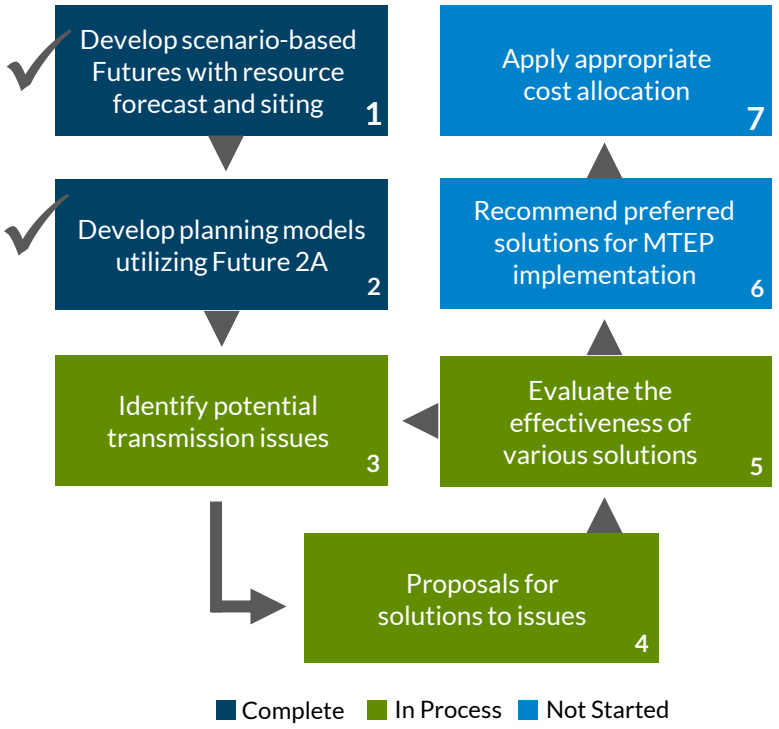
Step 2 **–** Develop reliability and economic models based Future 2A

Step 3 **–** Perform reliability and economic analysis to identify transmission issues

Step 4 **–** Accept solution ideas and draft proposed solutions for identified issues

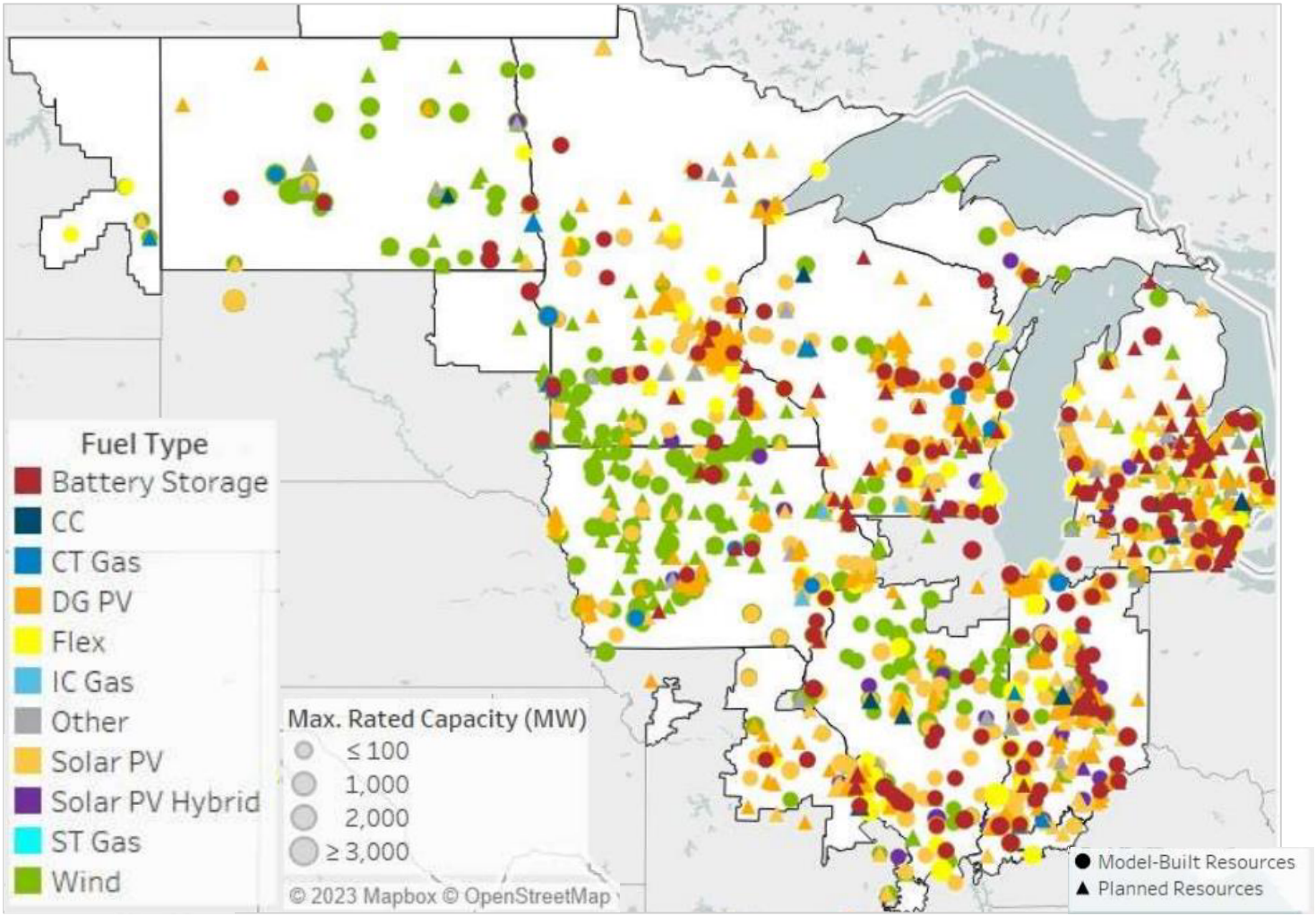
Step 5 **–** Evaluate proposed solutions for robustness, revisit potential issues as they're identified

Tranche 2 progress in 7-step process



MISO'S current iteration between steps 3, 4 and 5 will continue as the portfolio is refined in the alternatives assessment and validated through the business case analysis.

The total expansion for Future 2A in the Midwest Subregion provided the starting point in identifying issues and anticipated Tranche 2 solutions



Futures Report

The initial economic and reliability constraints discussed in December 2023 shaped the Tranche 2 portfolio

West

- 20% of facilities are overloaded
- Annual curtailments exceed 15%
- Increase of energy losses over transmission lines from 2.5% to 11%

Central

- 10% of facilities are overloaded
- Transmission needed to enable transfer of power between East and West
- More needs will be identified through transfer sensitivities and multi-element contingencies

East

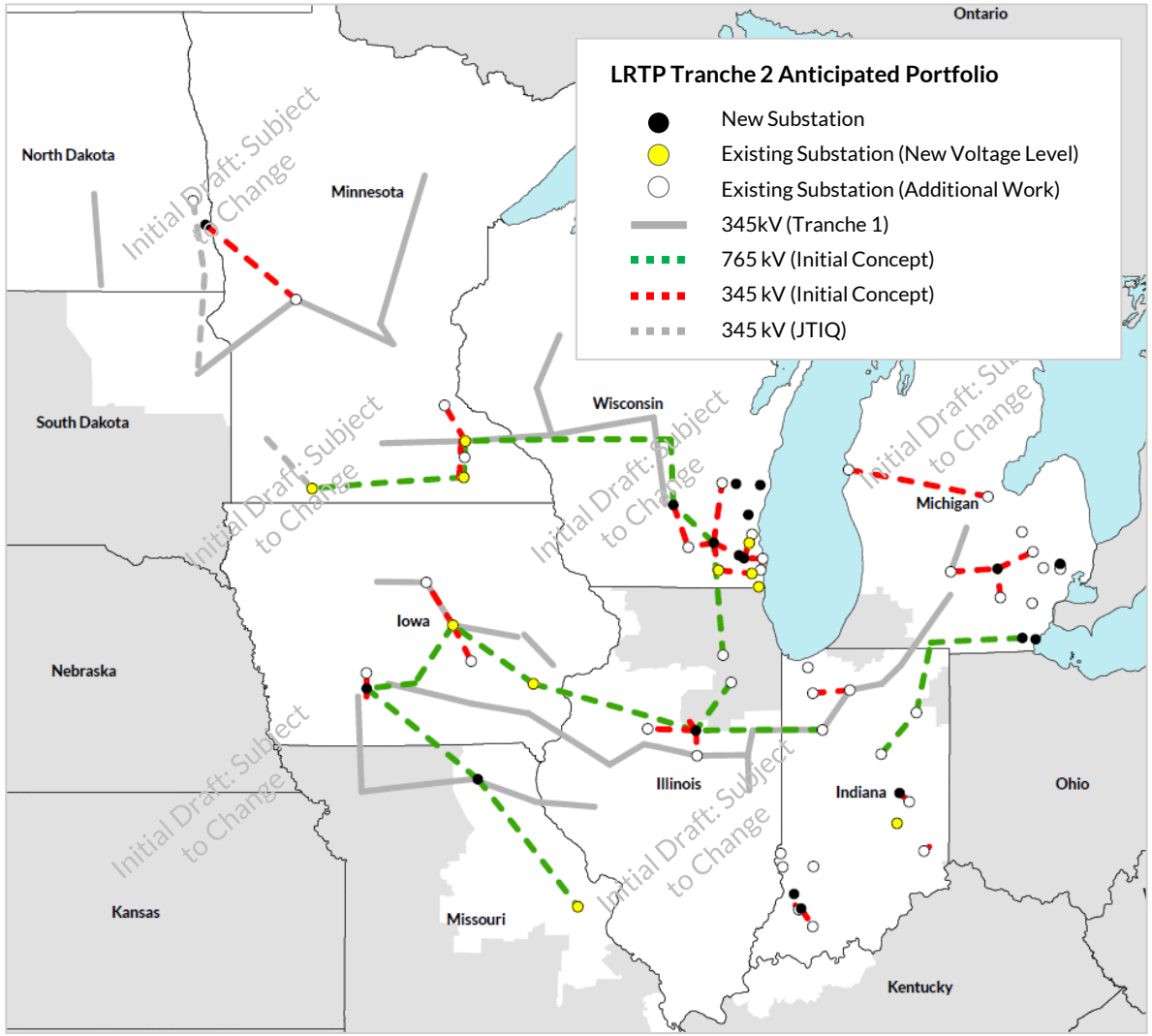
- 10% of facilities are overloaded
- Annual curtailments exceed 15%
- Transmission will need to mitigate import and export power swings between day and night

*Results from analysis through 12/31/2023

The draft anticipated portfolio will reliably and efficiently enable MISO member goals and load growth, with expected cost of $17 - $23 billion

LRTP Tranche 2

Projects as of 03/04/2024



This Tranche 2 portfolio focuses on creating a 765 kV transmission ‘highway’ within the MISO region to maximize value based on land use, line distances, transfer levels and costs

1 - 765 kV Circuit

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3 - 500 kV Circuits

6 - 345 kV Single Circuits

3 – 345 kV Double Circuits

Tranche 2 does not eliminate the consideration of HVDC, 345 kV or 765 kV for future needs

To refine and finalize the portfolio, MISO will determine the value of lines and analyze key alternatives

- How do different assumptions impact the future resource mix? ✓
- Under what conditions do lines in the portfolio provide value? ➡
- What blend of 345 kV, 765 kV, and HVDC* best meets system needs? ➡
- Are the projects identified in the portfolio robust solutions? ➡
- Does the portfolio provide benefits consistent with the Tariff criteria? ➡
- What are the impacts of other late-stage transmission projects?

NEXT STEPS: MISO will validate and adjust the portfolio as required through the business case analysis to ensure robustness

✓ Complete ➡ In Process

Moving forward, MISO will continue analyzing the anticipated portfolio, including evaluating stakeholder submitted alternatives

Transmission Solution Idea Submittal Forms

- On the MISO website, go to Planning tab > Long Range Transmission Planning
- Under related documents, find Submission Forms Part 1 & Part 2
- Submit completed forms to LRTP@misoenergy.org

- The submission window is open and will close April 5th
- Tranche 2 modeling and analysis data are posted*
  - Economic Study Models and Analysis
  - Reliability Study Models and Analysis
- MISO will also notify stakeholders as new analysis is performed and posted

The transmission solution submission window closes April 5th

*To access MISO's Sharefile site for transmission planning data and information, see slide 11

Appendix

Please submit requests to access MISO's Sharefile site for transmission planning data and information as soon as possible

Request access

- On the MISO website, click Stakeholder Engagement and then Client Services and Readiness

OR

- Contact the MISO Help Center at Help@misoenergy.org

- Specific requirements must be met
- Access to economic models and data also requires a PROMOD license
- Tranche 2 modeling and analysis data have been provided via stakeholder email communications