



Long Range Transmission Planning

New England Electricity Restructuring Roundtable

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Aubrey Johnson
Vice-President, System Planning

Long Range Transmission Planning is a regional planning effort focused on providing an orderly and timely transmission expansion effort 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

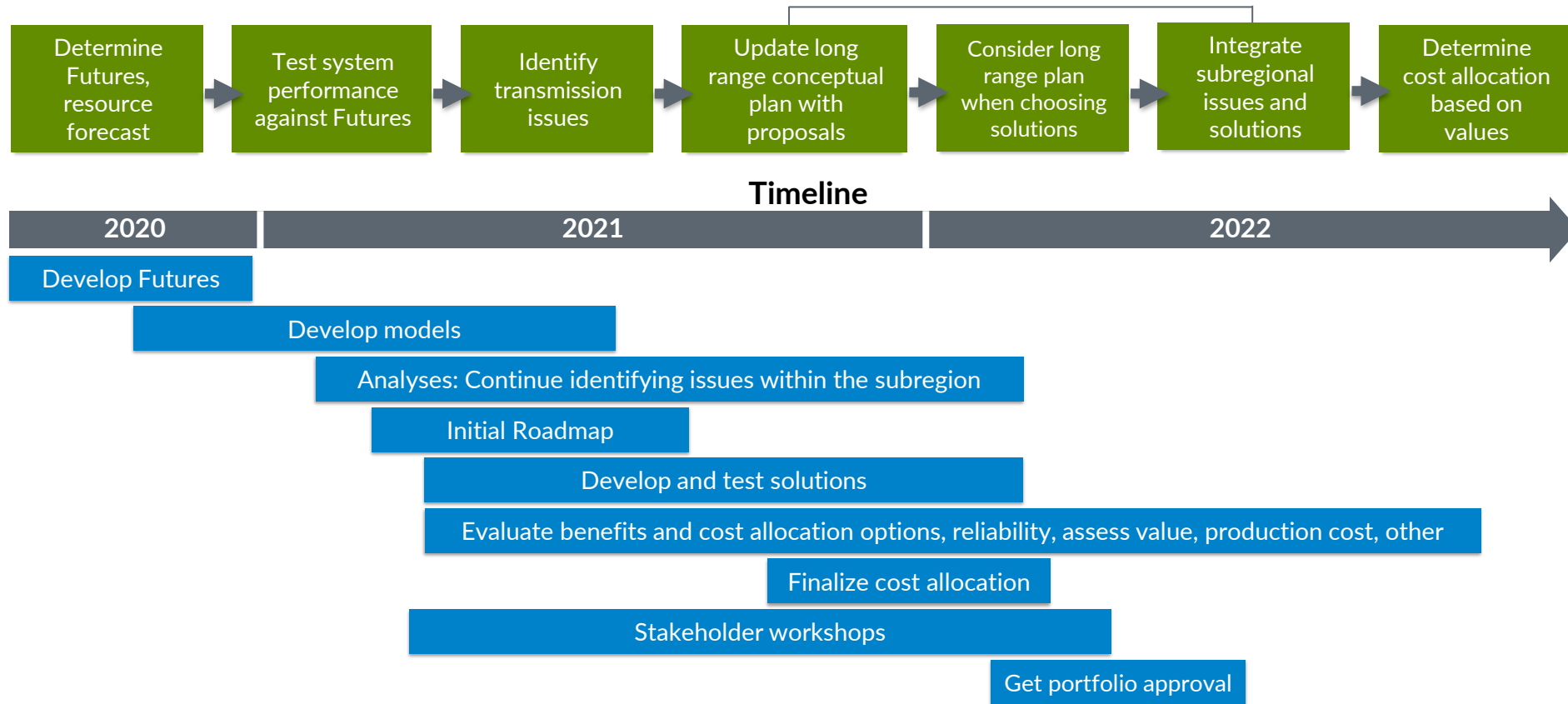
Flexible Resources



Allow more flexibility in the fuel mix for customer choice

Long Range Transmission Planning's Tranche 1 is the culmination of more than two years of planning activities

Long Range Transmission Planning Process



Stakeholder input was critical



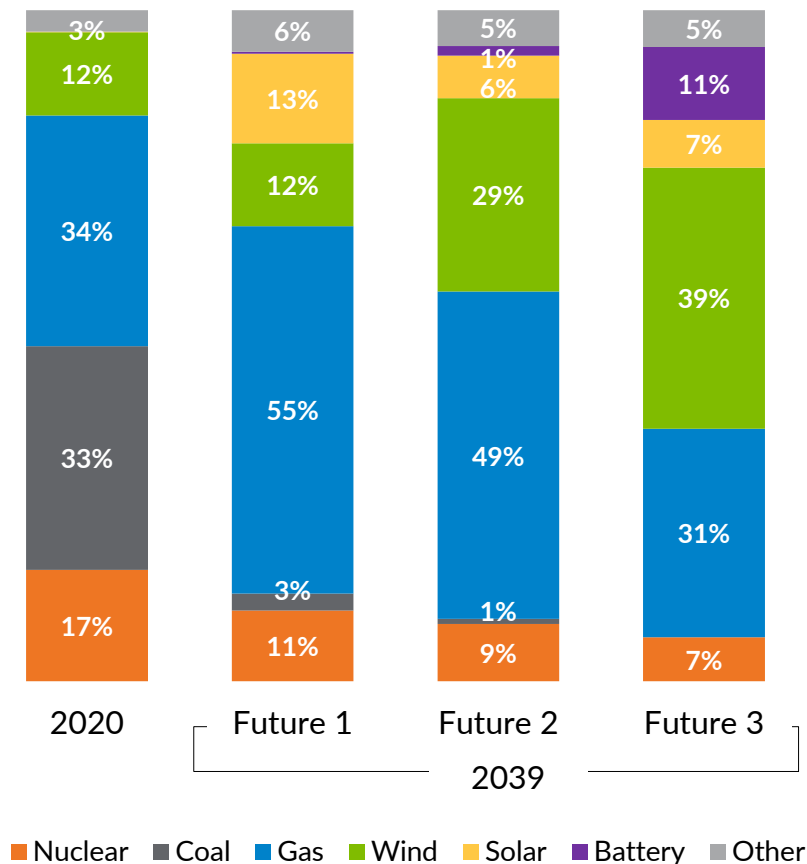
200+ internal and external meetings



200 - 300 attendees at each external meeting and workshop

The Futures incorporate and build upon member plans to inform the resource transition and changing demand patterns

Generation Energy Mix



Tranche 1

Future 1

- Footprint develops in line with 100% of utility integrated resource plans and 85% of utility/state announcements, etc.
- Emissions decline as an outcome of utility plans
- Load growth consistent with trends

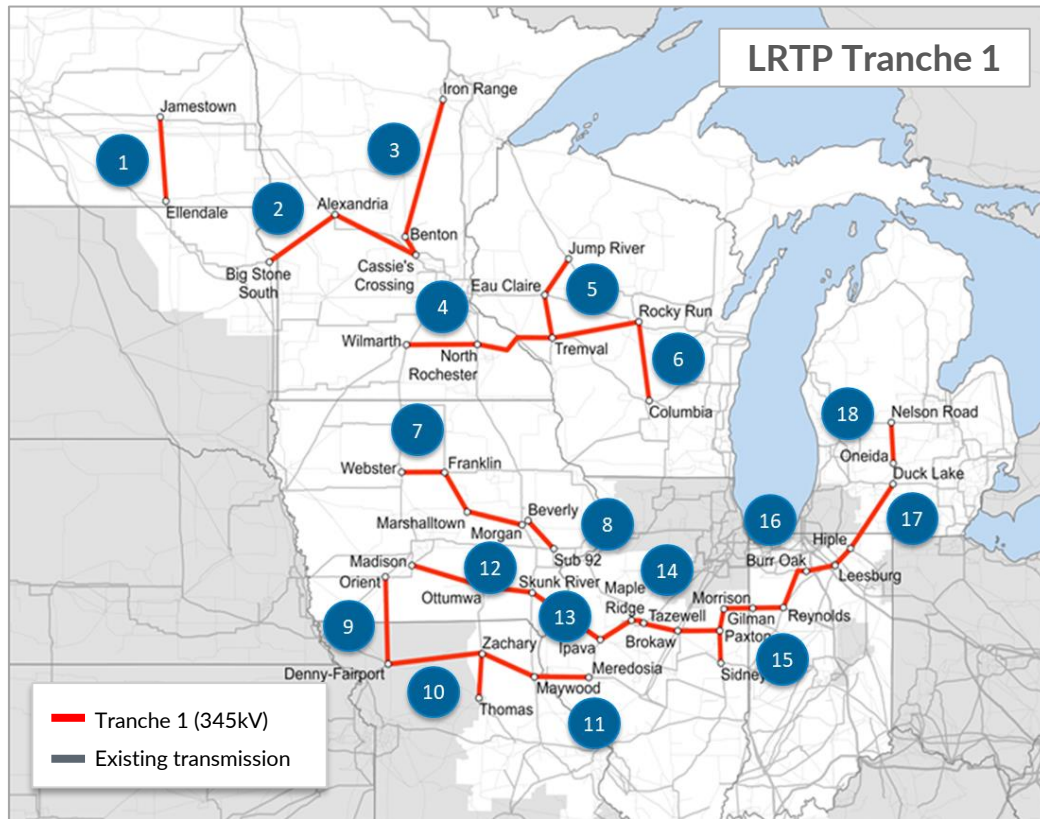
Future 2

- Companies/states meet their goals, mandates, etc.
- Footprint-wide carbon emission reduction of 60% by 2040
- Energy increases 30% footprint-wide by 2040, driven by electrification

Future 3

- Changing federal and state policies support footprint-wide carbon emission reduction of 80% by 2040
- Increased electrification drives a footprint-wide 50% increase in energy by 2040

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



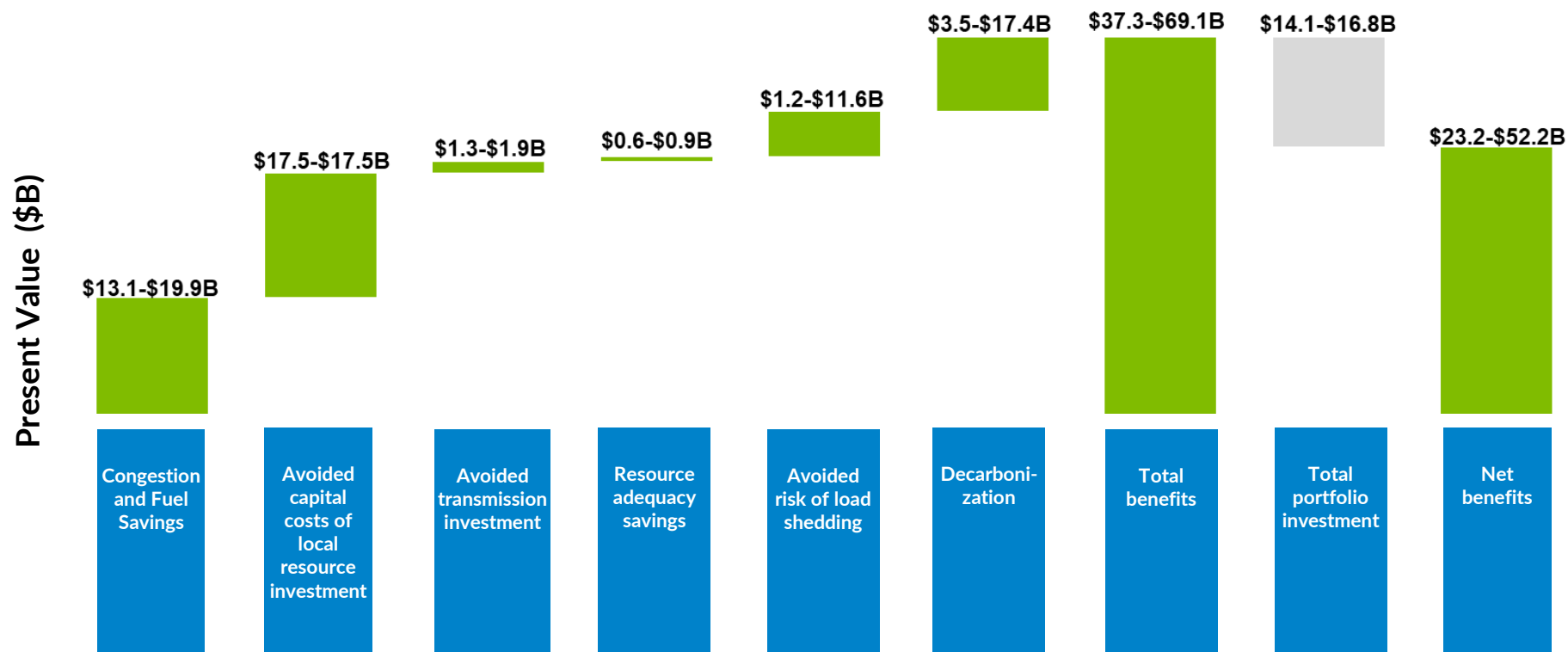
Assumption on all in-service dates is by 2030

| 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 |
| Total Project Portfolio Cost | | \$10.3B |

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

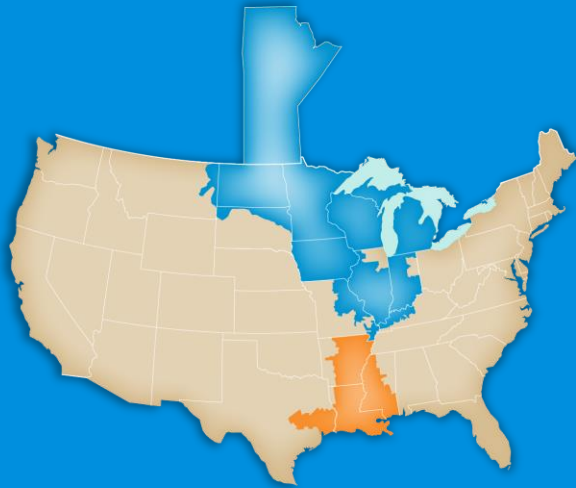
L RTP Tranche 1 Benefits vs. Costs 20 – 40-Year Present Value (2022 \$B)

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



A Multi-Value Project (MVP) subregional cost allocation approach will apply to Tranches 1 and 2, and will evolve with future tranches

Consistent with FERC's "costs roughly commensurate with benefits" requirement

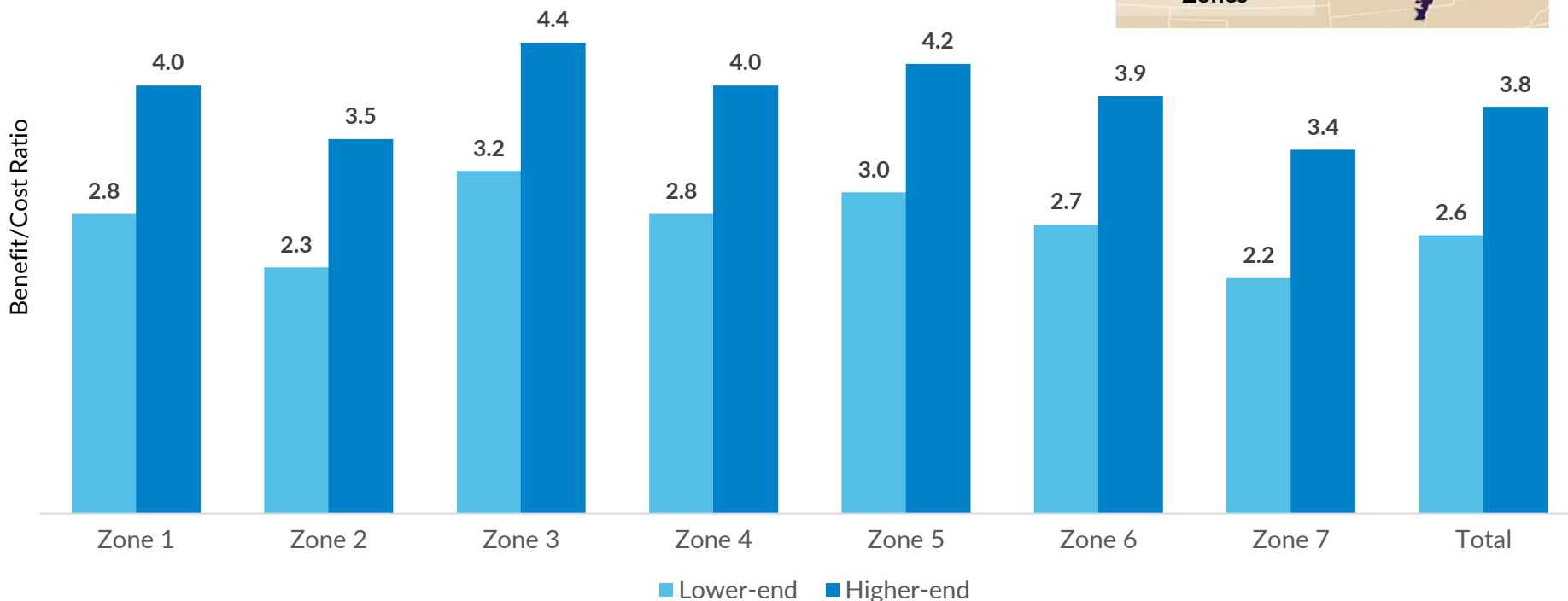
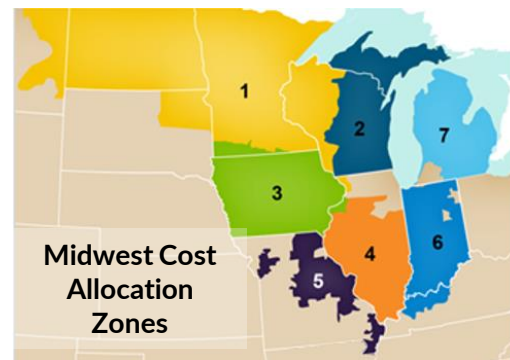


Project portfolio must have benefits spread broadly within a subregion (Midwest or South)

- Allows uniform, subregional MVP postage stamp rates in Midwest and South Subregions
 - Cost of subregional portfolios allocated entirely to the subregion where benefits are broadly spread
- Retains MISO-wide cost allocations for MVP portfolios that benefit the entire footprint
- Does not affect cost allocation of the existing 2011 MVP portfolio

Benefits will be broadly distributed across the Midwest subregion and deliver a benefit to cost ratio of at least 2.1 for all zones

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



With the approval of the Tranche 1 Portfolio, oversight and monitoring commences to ensure successful project completion

Competitive Developer Selection

Select a developer to finance, construct, own and operate eligible facilities for each project

Quarterly Project Reporting

Monitor for variances: cost, schedule and ability of developer/TO to complete project

Annual & Triennial Reviews

Conduct studies to update information on the costs and benefits of approved MVP portfolios

Provides transparency of project information to the stakeholder community

The next step in Long Range Transmission Planning is to develop Tranche 2, which begins with a refresh of key Futures data inputs

EXISTING DEFINITIONS

Future 1

- Footprint develops in line with 100% of utility IRPs and 85% of utility/state announcements
- Emissions decline as an outcome of utility plans
- Load growth is consistent with pre-2019 trends

Future 2

- Companies/states meet their goals, mandates
- Footprint-wide carbon reduction of 60%
- Energy increases 30%, driven by electrification

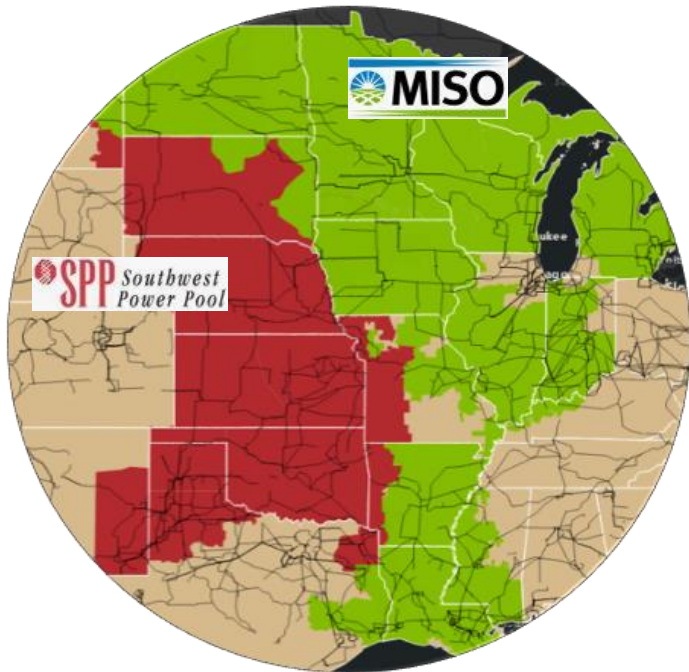
Future 3

- Changing federal and state policies support footprint-wide carbon reduction of 80%
- Increased electrification drives a footprint-wide 50% increase in energy demand

UPDATES

- State and member plans
 - Announced additions, retirements, carbon goals, renewable targets
 - Updated Integrated Resource Plans
- Capital, operating and fuel costs
- Planning Reserve Auction data
- Additions and retirements from the Generator Interconnection Queue and FERC retirement process reforms
- Generation fleet changes influenced by the Inflation Reduction Act
- Note: Load shapes and forecasts will remain the same but will be extended to match the 20-year study period

The first study of its kind, the SPP-MISO Joint Targeted Interconnection Queue (JTIQ) study overlapped the Tranche 1 study



- Addresses evolving resource mix of both RTOs
- The transmission system is at capacity along the SPP-MISO seam
- Upgrades are too costly for small groups of interconnection customers, contributing to churn in the queue
- Exemplary interregional coordination
 - Queue Process Alignment and Relative Queue Priority updates approved by FERC in June 2022
- Looking to replace the Affected System Study (AFS) process within individual queue cycles

The current JTIQ portfolio includes five projects with an estimated cost of ~\$1.1B



- Improves reliability by fully resolving targeted transmission constraints identified in the study
- Increases interregional transfer capability
- Enhances ~28.6 GW in combined system interconnection capacity
- Aligned MISO-SPP interconnection process
 - Relative Queue priority - First Ready First Served