Illinois State Institute for Regulatory Policy Studies Conference

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Overview

- **MISO**
  - RTOs
  - What We Do
- **FERC Order 1000**

- **MISO's View of FERC Order 1000**
  - MISO's Planning Process
  - MVPs
    - Benefits
    - Jobs
- **Issues, Challenges, Unknowns**

RTOs

- Non-profit organization that controls transmission, but does not own transmission assets
- Provides non-discriminatory access to the grid: managing congestion, maintaining the reliability and security, and providing billing and settlement services
- Most operate wholesale energy, reserve, and FTR markets
- Regulated by the FERC
- Voluntary, independent
- Serves over 65 percent of the load in the U.S.
- Independent board of directors

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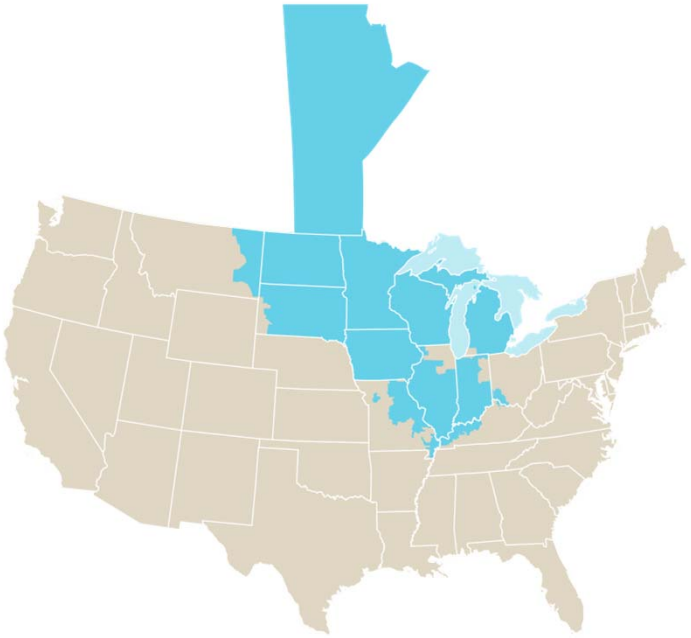
MISO's role is concentrated in a few key areas

What We Do	Implications
Provide independent transmission system access	>Equal and non-discriminatory access >Eliminate transmission rate pancaking (staked fees)
Deliver improved reliability coordination through efficient market operations	>Improved regional coordination >Independent lowest cost unit commitment, dispatch, and congestion management
Coordinate regional planning	>Integrated system planning >Balance transmission and generation tradeoffs
Provide price information transparency	>Market price/value discovery >Encourage prudent infrastructure investment >Provide wholesale alignment for retail policy implementation

Scope of Operations: 12 States and 1 Canadian Province

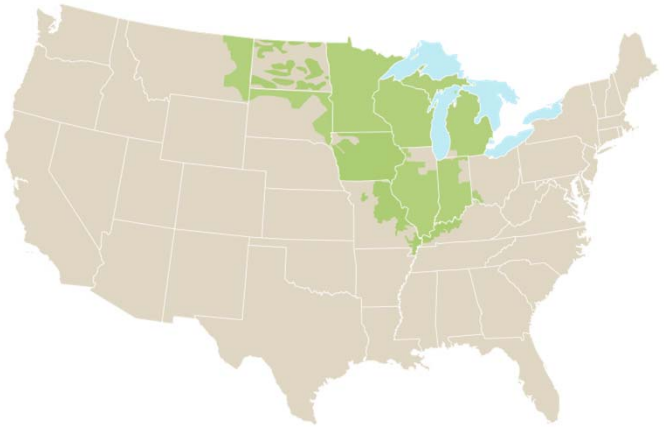


Reliability footprint

Installed Generation Capacity
146,497 MW

Peak Demand
110,032 MW

53,203 miles of transmission



Market footprint

Installed Generation Capacity
134,850 MW

Peak Demand
103,975 MW

Market Operations

- ~ $27.5 billion per year settled in energy markets (2010)
- 5-minute dispatch
- 1,975 pricing nodes
- 5,833 generating units
- 374 market participants serving 40.3 million people

FERC Order 1000 - Transmission Planning and Cost Allocation

- FERC issued Order 1000 on new transmission planning and cost allocation requirements to build on the principles identified in Order 890
  - Coordination; Openness; Transparency; Information Exchange; Comparability; Dispute Resolution; Regional Participation; Economic Planning Studies and Cost Allocation
- The new rules address:
  - Participation in a regional planning process
  - Planning for public policy requirements, such as renewable mandates
  - Coordinated planning and improved cost sharing for interregional facilities
  - Elimination of federal “right of first refusal” for projects identified in a regional planning process with regional cost allocation
  - Principles for regional and interregional cost allocation

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FERC Order 1000 is intended to promote transmission investment by increasing coordination among regions and providing cost allocation guidance

Regional Planning

- **Promote collaboration among neighboring utilities to find more cost-effective transmission solutions**
- **Enhance transparency and openness of regional planning**
- Affirmative requirement to create a regional plan
- Creates obligation to consider public policy objectives
- Region must be larger than a single, incumbent provider footprint
- Compliance in 12 months

Interregional Planning

- **Facilitate evaluation of interregional facilities that may address the individual needs of neighboring regions more efficiently**
- **Promote broad geographic transmission planning**
- Neighboring regions must jointly consider proposed facilities that cross regional boundaries
- Data exchange and transparency provisions must be jointly developed
- Compliance in 18 months

Cost Allocation

- **Accounts for benefits in order to promote transmission investment**
- **Addresses "freerider" concerns by promoting cost allocation, while addressing the socialization critique**
- Must incorporate a "beneficiaries pay" cost allocation methodology
- Costs cannot be allocated outside the region without external party consent
- Cost allocation can vary for different types of projects

Federal Right of First Refusal

- **Promote efficient transmission investment by allowing non-incumbent developers to participate in cost allocation**
- **Eliminate the use of ROFR rights to prevent projects that would deliver market benefits**
- Federal ROFR rights must be removed from tariffs
- Regions must create non-discriminatory selection criteria for competing projects
- ROFR rights retained for upgrades to a company's own facilities

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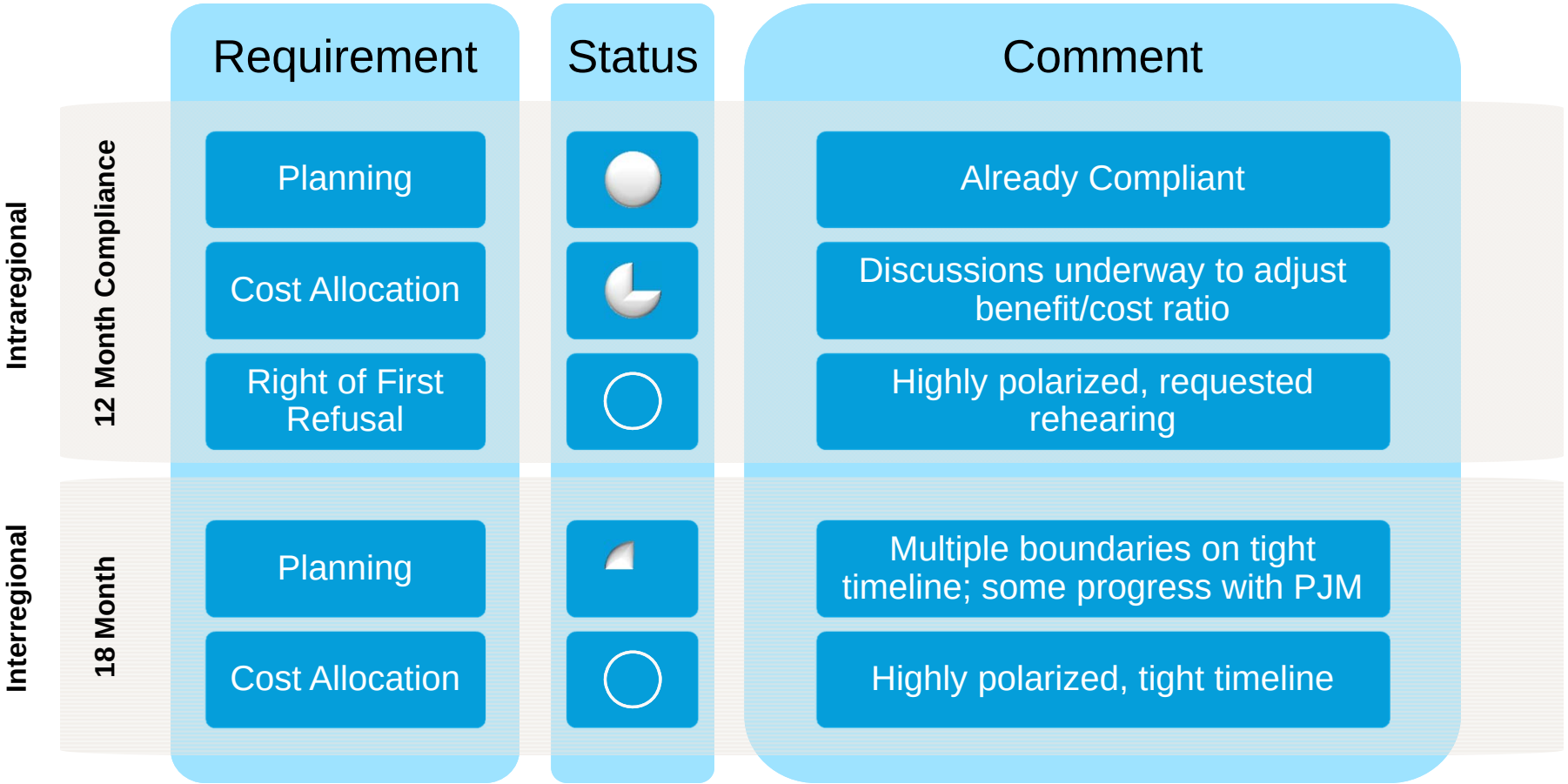
MISO is largely compliant with Intra-regional requirements. However, significant work remains to address Inter-regional planning with our neighbors



MISO Planning Objectives

Fundamental Goal

The development of a comprehensive expansion plan that meets reliability needs, policy needs, and economic needs

MISO Board of Director Planning Principles*

- Make the benefits of an economically efficient energy market available to customers by providing access to the lowest electric energy costs
- Provide a transmission infrastructure that safeguards local and regional reliability and supports interconnection-wide reliability
- Support state and federal energy policy objectives by planning for access to a changing resource mix
- Provide an appropriate cost mechanism that ensures the realization of benefits over time is commensurate with the allocation of costs
- Develop transmission system scenario models and make them available to state and federal energy policy makers to provide context and inform the choices they face

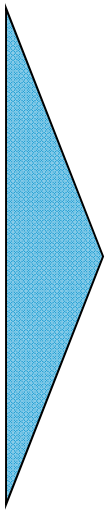
* As modified and approved by MISO Board of Directors System Planning Committee 5/16/2011; pending full board approval

Planning Model Evolution

In order to achieve its planning objectives, MISO has transformed its transmission expansion planning model; this process will continue to mature as experience is gained

Reliability-Based Model

- Focused primarily on grid reliability
- Typically considers a short time horizon
- Seeks to minimize transmission build



Value-Based Model

- Focused on value while maintaining reliability
- Reflects appropriate project time scales
- Seeks to identify transmission infrastructure that maximizes value
- Identification of the comprehensive value of projects

MTEP Activities

	Top Down Planning	Bottom Up Planning	Interconnection Queue	Policy Assessment
Description	•Develop solutions for outstanding needs, •Test effectiveness of input plans and seek efficiencies	Ensure plans identified by the member Transmission Owners are sufficient to address reliability standards and form an efficient set of expansions to meet identified needs	Evaluate specific interconnection requests and Place resulting upgrades in base expansion model	Analyze the impacts of changes in state or federal policy on the MISO system
Examples	Regional Generator Outlet Study, Candidate MVP Portfolio, MTEP economic analysis, Long Term Assessment	MTEP reliability analysis	Interconnection Studies, System Planning and Analysis, Detailed Planning Phase	EPA Regulations study, Eastern Wind Integration Transmission Study
Tools	Production Cost models (PROMOD), Generation Expansion (EGEAS), Loss of Load (MARS)	Load flow models (PSS/E)	Load flow models (PSS/E)	All

How Do You Decide On a Strategy?

- **Robustness testing**
  - How does an alternative perform in a variety of future scenarios?
  - Are significantly greater economic benefits projected in one case over the other?
- **Faith based scenario evaluation**
  - What would you have to believe?
  - Actively test important assumptions
- **Delay choosing as long as possible**
  - Without jeopardizing legal requirements
  - Without risking wasted investment

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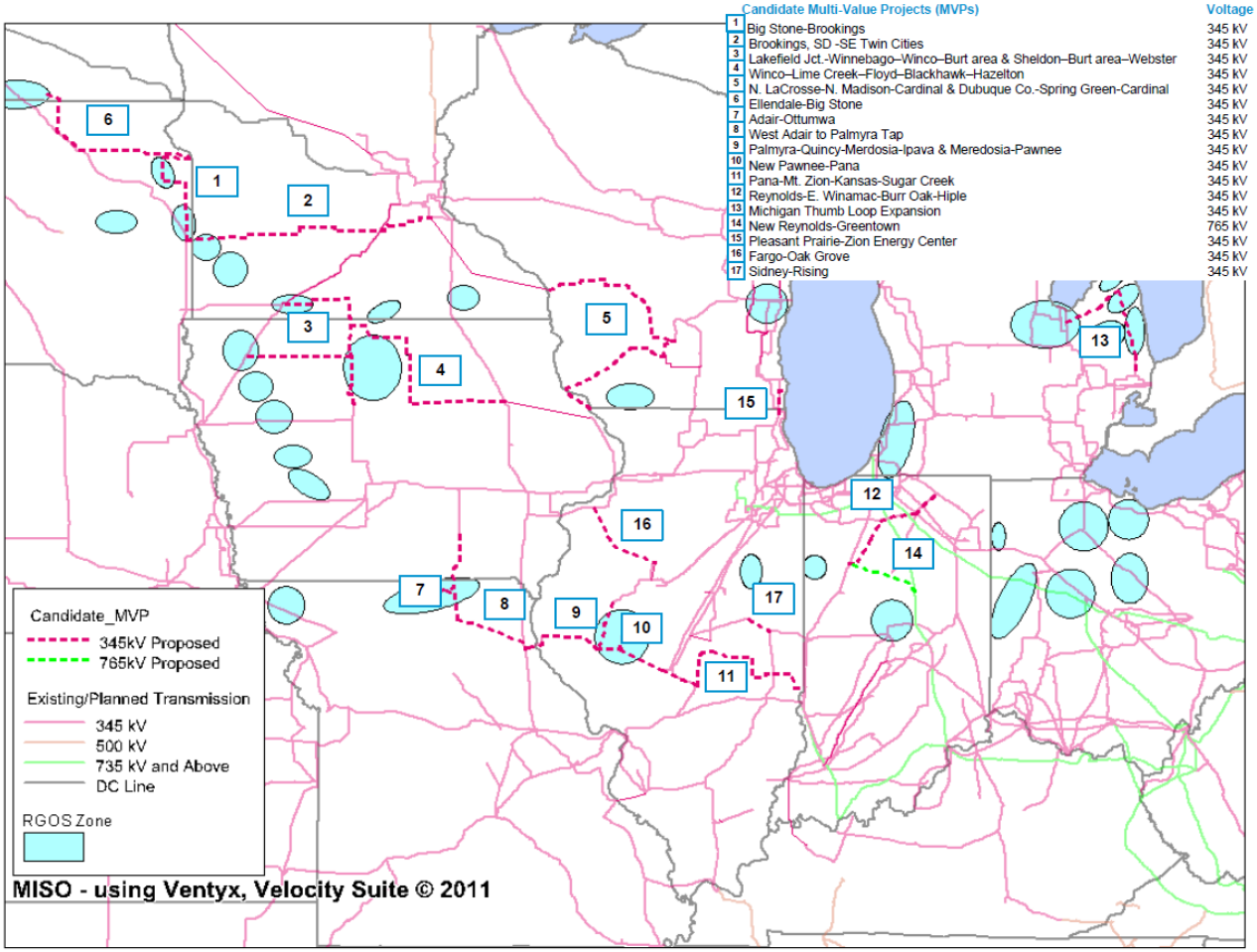
These evaluations culminated in the recommendation of the 2011 MVP Portfolio



- The 2011 MVP Portfolio Analysis is the culmination of MISO's planning efforts to meet the public policy mandates of the MISO states, while simultaneously minimizing the total cost of delivered power to consumers
- This analysis serves to justify and demonstrate the value of a regional portfolio of projects, which brings multiple benefits to stakeholders throughout the MISO footprint.
- B/C of 1.7/1 to 2.7/1 with sensitivity cases as high as 5.4/1

Multi Value Projects reliably and economically enable established energy policy choices

- The proposed Multi Value Project Portfolio creates a robust transmission system that provides value under a wide range of policy, economic, and operating conditions
- Specifically, it
  - Provides benefits in excess of its costs under all scenarios studied, with its Benefit–to–Cost ratio ranging from 1.8 to 3.0; the average residential customer will receive $23 in annual benefits for a cost of $11 per year
  - Maintains system reliability by resolving reliability violations on about 650 elements for more than 6,700 system conditions and mitigating 31 system instability conditions
  - Enables 41 million MWh of wind energy annually to meet renewable energy mandates and goals
  - Provides an average annual value of $1,279 million over the first forty years of service, at the cost of an average annual revenue requirement of $624 million*
  - Supports a variety of generation policies through utilizing a set of energy zones which support wind, natural gas, and other fuel sources

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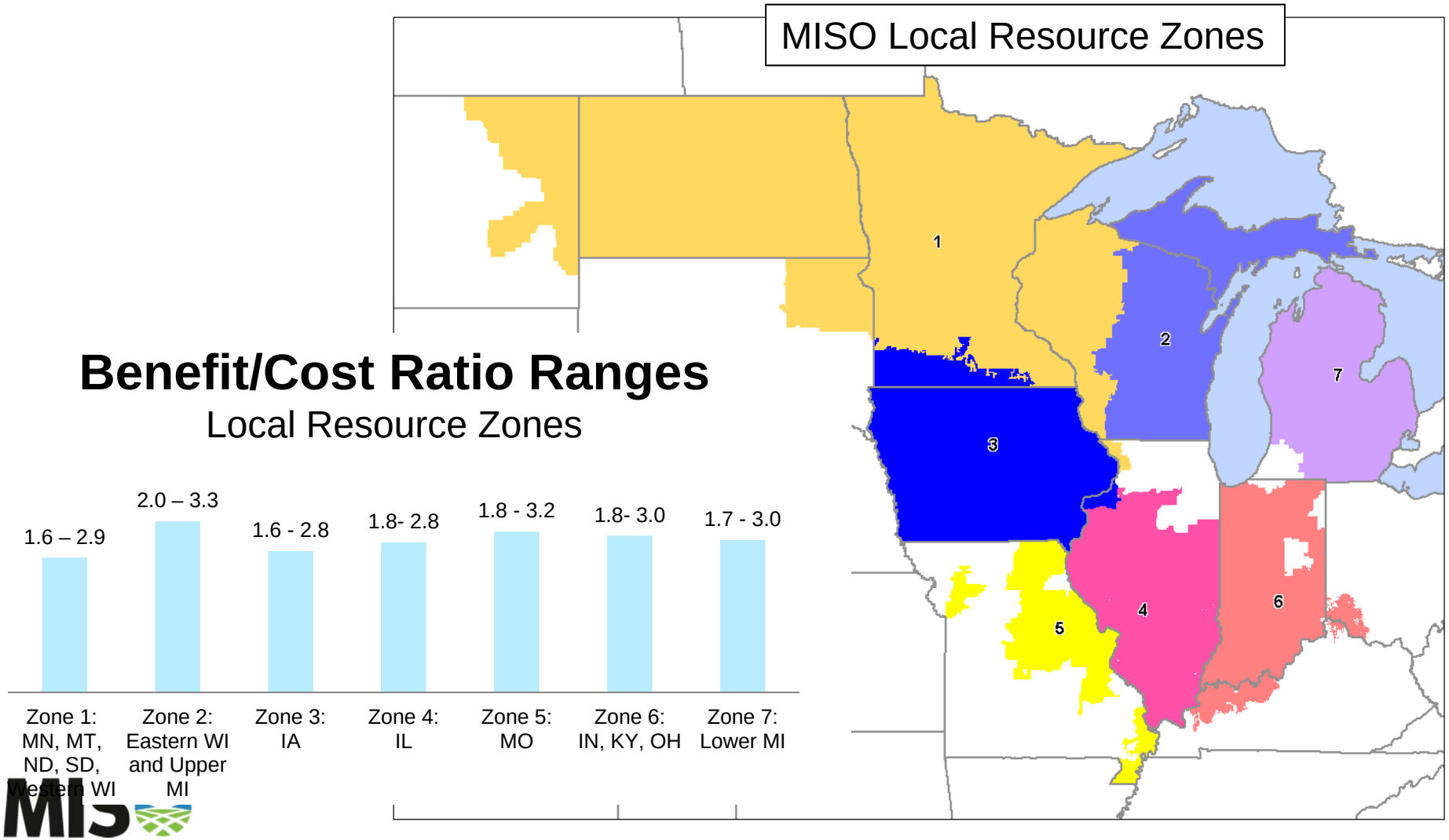
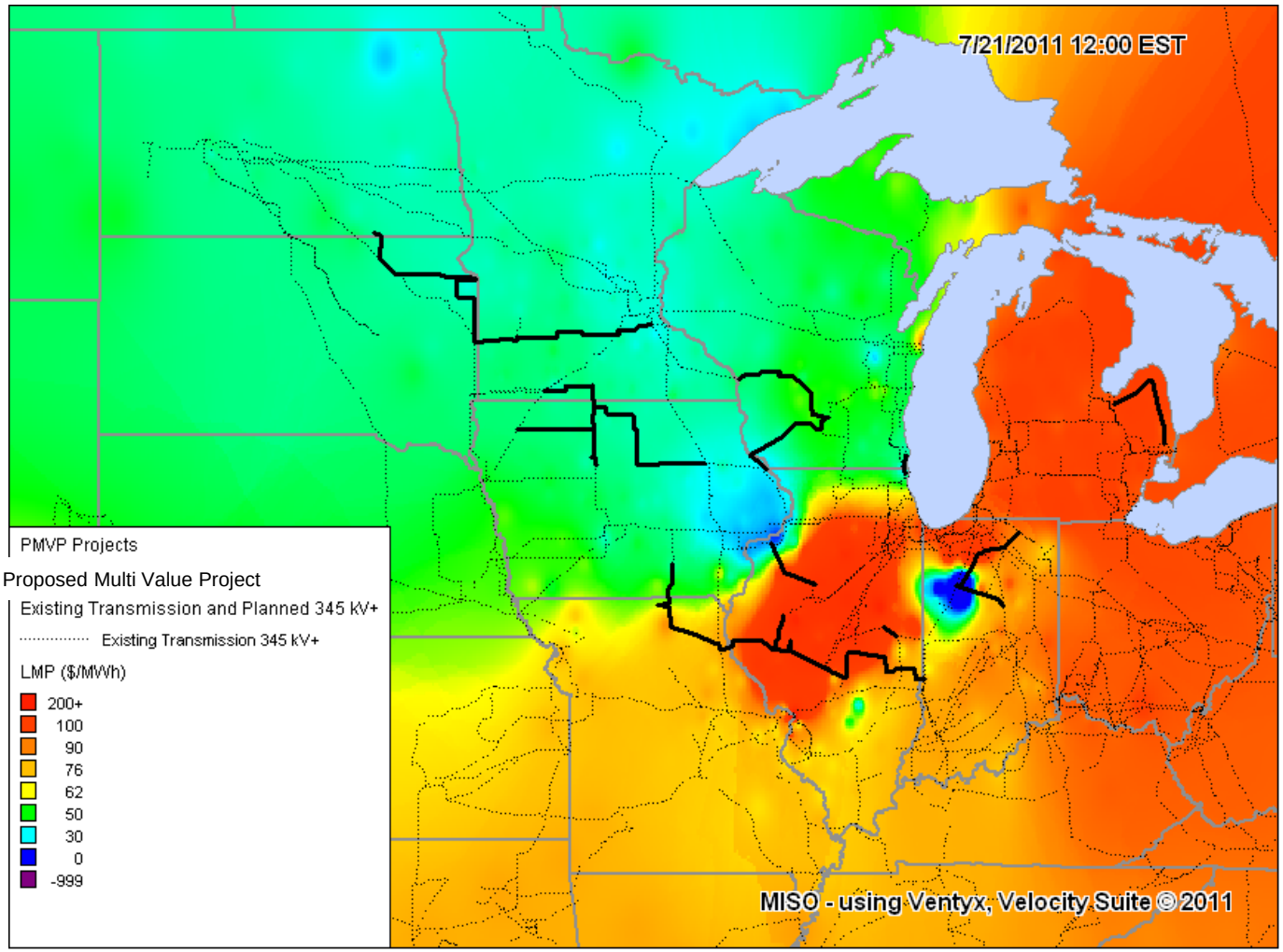
** Based on a total portfolio capital cost of $5.2 billion, in 2011 dollars*
Final costs are subject to change as actual construction estimates are received

Multi-Value Projects will cost an average residential customer $11 a year but will provide $23 in annual benefits



Proposed transmission expansion projects will greatly reduce system congestion allowing low cost generation to reach load



Benefits to Zone 4 - Illinois

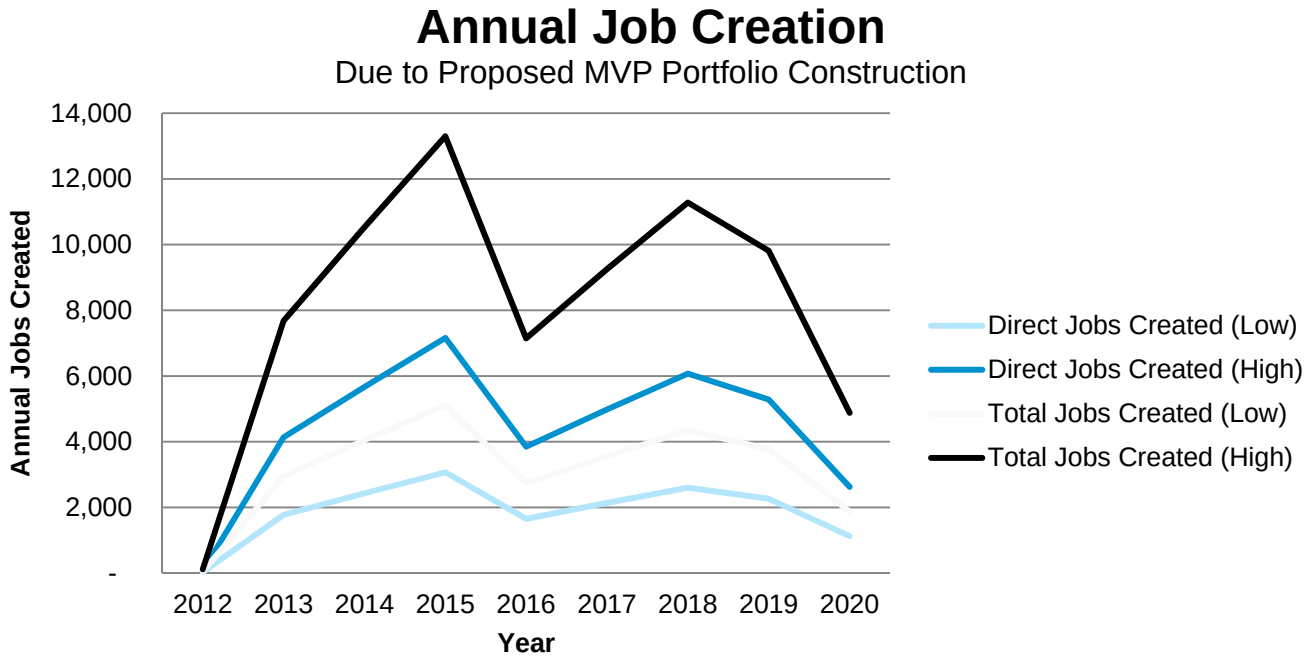
MISO's proposed Multi-Value Projects portfolio will create thousands of jobs for Illinois. Estimates include the following:

- 2,300 - 5,500 direct (construction) jobs
- Between 3,900 and 10,200 total jobs including construction, supplier and other downstream opportunities

As a result of MVPs, Illinois consumers will see economic benefits ranging from 1.8 to 2.8 times the costs. These benefits include:

- $1 billion to $3 billion from enabling low-cost generation to displace higher-cost generation
- $3 million to $8 million from more efficient dispatch of operating reserves
- $10 million to $36 million from reductions in energy wasted on transmission losses, reducing future generation investment required to serve those losses
- $301 million to $555 million in benefits through supporting a regional wind integration methodology
- $92 million to $457 million from reduced future Planning Reserve Margin Requirements, which reduces installation of future generation to meet this requirement
- $37 million to $129 million in avoided costs for reliability projects that would otherwise need to be constructed

MVPs create local jobs and investment



- For each million dollars of transmission investment, the proposed Multi Value Portfolio will create
  - Between 3 and 7 direct jobs
  - Between 5 and 13 total jobs
- **In aggregate, the proposed Multi Value Project portfolio will create between 17,000 to 39,800 construction jobs and 28,400 to 74,000 total jobs.**

Source: Responses of MISO stakeholders in the *Employment and Economic Benefits of Transmission Infrastructure Investment in the U.S. and Canada* publication by The Brattle Group.

MISO Cost Allocation Overview

Allocation Category	Driver(s)	Allocation Overview
Baseline Reliability Project	NERC Reliability Criteria	Primarily shared locally through Line Outage Distribution Factor Methodology; 345 kV and above 20% postage stamp to load
Generator Interconnection Project	Interconnection Request	Paid for by requestor; 345 kV and above 10% postage stamp to load
Market Efficiency Project[1]	Reduce market congestion when benefits are 1.2 to 3 times in excess of cost	Distribute to planning regions commensurate with expected benefit; 345 kV and above 20% postage stamp to load
Multi Value Project	Address energy policy laws and/or provide widespread benefits across footprint	100% postage stamp to load

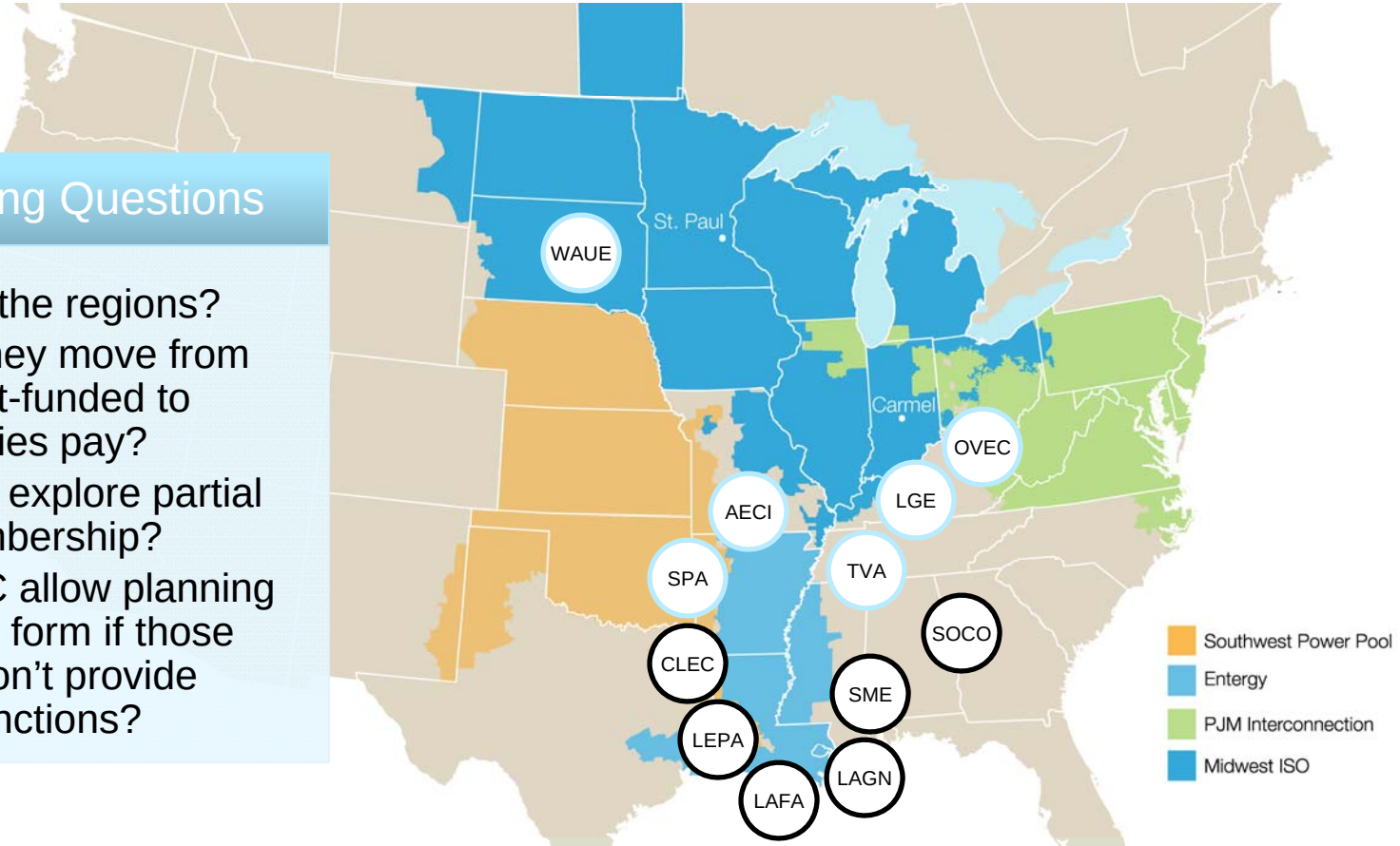
1. Market Efficiency Project cost allocation methodology currently under review at the RECBTF

Regional and Interregional Planning

- **While the path forward may be reasonably clear for RTO regions, how will non-RTO areas comply?**

Outstanding Questions

- What are the regions?
- How do they move from participant-funded to beneficiaries pay?
- Will some explore partial RTO membership?
- Will FERC allow planning regions to form if those regions don't provide market functions?



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First Tier Interface with MISO Classic

First Tier Interface with Entergy

Issues, Challenges and Unknowns

- Elimination of Federal ROFR – how to manage relationships with state regulators and transmission owners
- Public Policy consideration – Single-state vs. Multi-state issues
- Entergy – how to manage coordination issues between now and full integration
- What path will the non-RTO regions take?
- Others?

MISO continues to work with our RTO neighbors to optimize the efficiency of the market at our borders

Interchange Optimization

- Increase the economic efficiency of energy flows between markets
- Evaluating options to optimize real time interchange between adjacent markets
- Results in lowering the overall operating costs across the markets

Capacity Deliverability

- Eliminate artificial (Policy) barriers to capacity transactions between markets
- The only barrier to transactions should be actual physical transfer constraints
- Goal is to improve the transparency and efficiency of cross-border capacity deliverability between markets

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