

U.P. Energy Summit
Jesse Moser
October 16, 2012

Who is MISO

- **Independent, non-profit organization responsible for maintaining reliable transmission of power in 11 states and one Canadian province**
- **First Regional Transmission Organization (RTO) approved by the Federal Energy Regulatory Commission (FERC)**



Scope of Operations

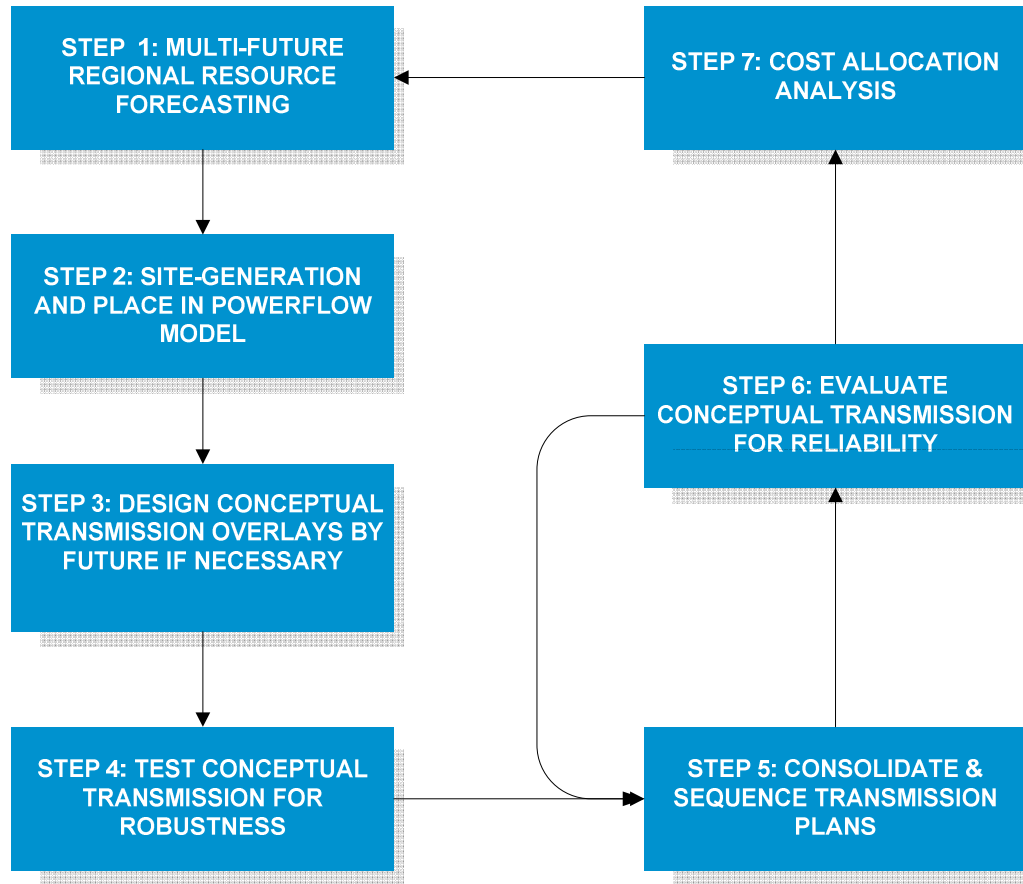
as of June 1, 2012

- **Generation Capacity**
 - 132,313 MW (market)
 - 144,599 MW (reliability)
- **Historic Peak Load**
(July 23, 2012)
 - 98,576 MW (market)
 - 104,669 MW (reliability)
- **49,670 miles of transmission**
- **11 states, 1 Canadian province**
- 5-minute dispatch
- 1,936 pricing nodes
- 1,258 generating units (market)
- 6,060 generating units (network model)
- \$23.6 billion gross market charges (2011)
- 356 market participants serving 38.9 million people

What We Do

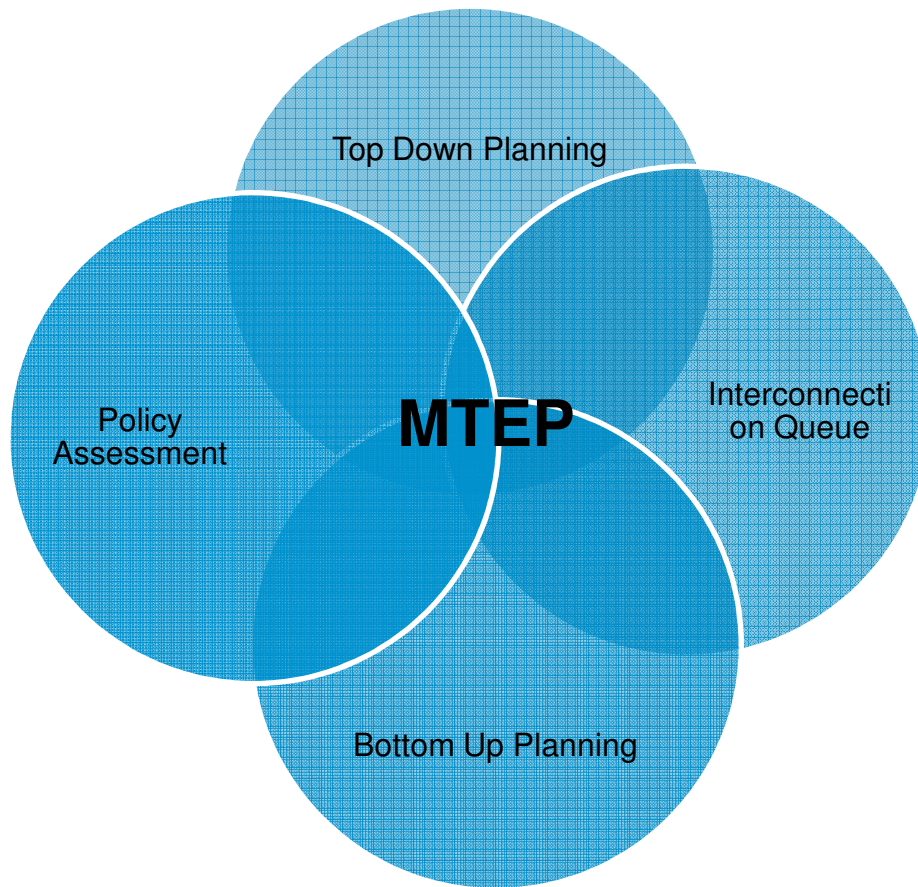
- **Monitor energy transfers on the high voltage transmission system**
- **Schedule transmission service**
- **Manage power congestion through security-constrained economic dispatch**
- **Operate day-ahead and real-time energy and operating reserves markets**
- **Regional transmission planning**

MISO Value Based Planning



- **The MISO value based planning process is applicable to all MISO planning activities**
 - There may be multiple iterations of this process before projects are fully evaluated (e.g. MTEP Exploratory analysis to Regional Generator Outlet Study to Candidate MVP Portfolio)
 - Depending on the application different steps of the process might be used.

MISO Transmission Expansion Plan (MTEP)



- The MTEP is the culmination of all planning efforts performed by MISO during a given planning cycle
- A biannual report is produced, with most projects being approved in December
- Establishes the recommended regional plan that integrates expansion based on reliability, transmission access, market efficiency, public policy and other value drivers across all planning horizons

Incorporating Public Policy in Planning Process

- Policy is considered in all aspects of the MISO Planning Process
- State and Federal laws are part of base model development
- Additional policy driven Futures are developed with stakeholders
- Evaluating multiple policy Futures results in a robust transmission plan

MISO Board of Director Planning Principles

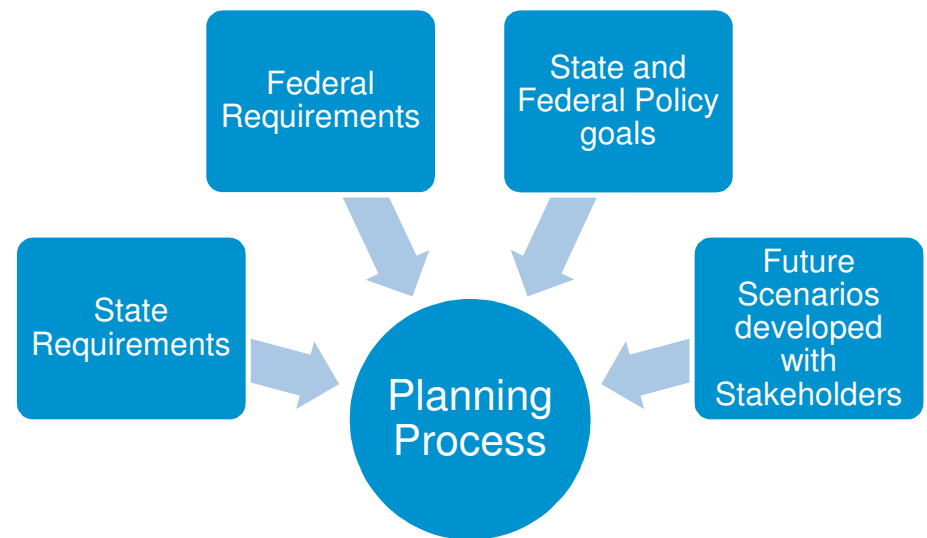
Make the benefits of an economically efficient energy market available to customers by providing access to the lowest electric energy costs

Provide a transmission infrastructure that safeguards local and regional reliability and supports interconnection-wide reliability

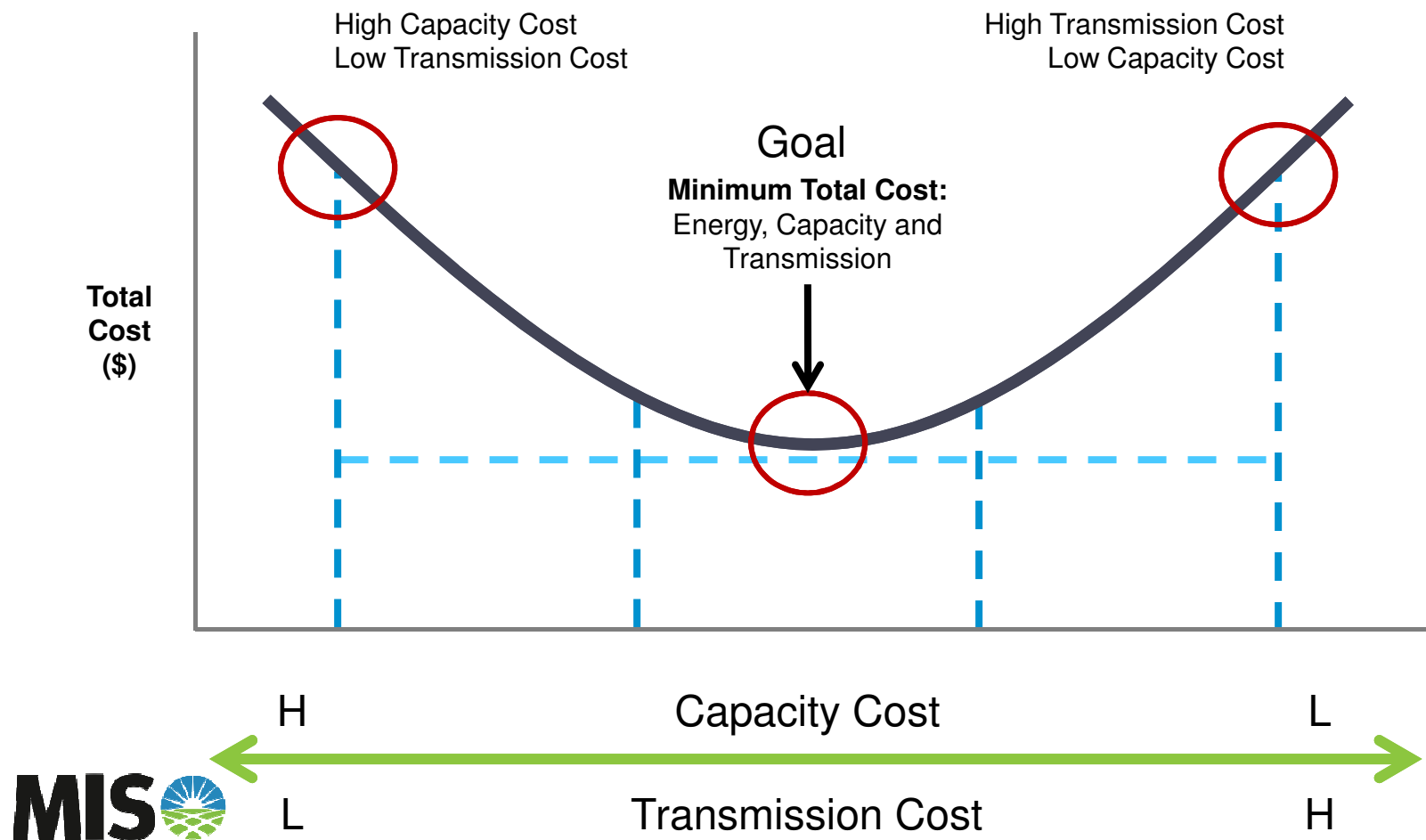
Support state and federal energy policy objectives by planning for access to a changing resource mix

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

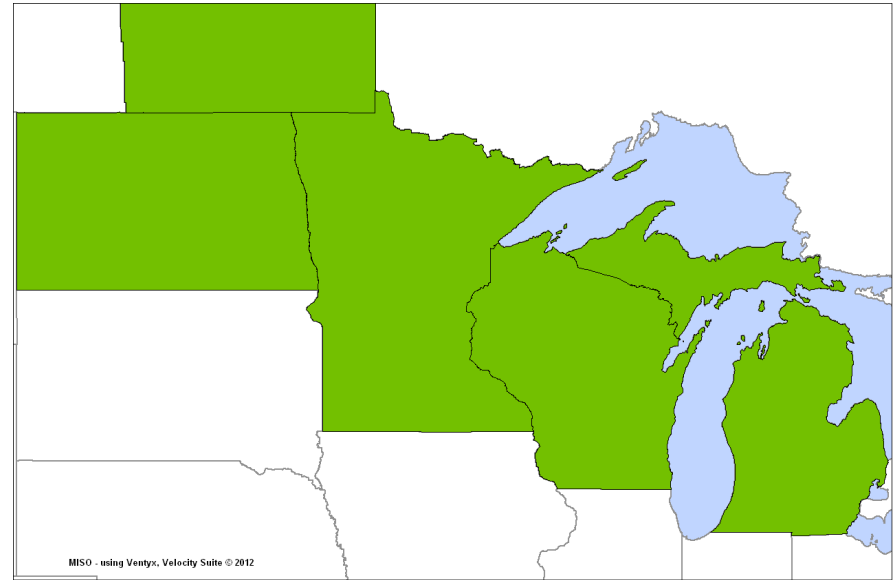


Focus is on Minimizing the Total Cost of Energy Delivered to Consumers...



Northern Area Study Overview

- **Driver: Multiple proposals by stakeholders & reliability issues located in MISO's northern footprint**
- **Objective is to conduct a comprehensive study to:**
 - Identify the economic opportunity for transmission development in the area
 - Evaluate the reliability & economic effects of drivers on a regional, rather than local, perspective
 - Develop indicative transmission proposals to address study results with a regional perspective
 - Identify the most valuable proposal(s) & screen for robustness
- **2012 analysis will provide guidance for next steps**



Study Assumptions

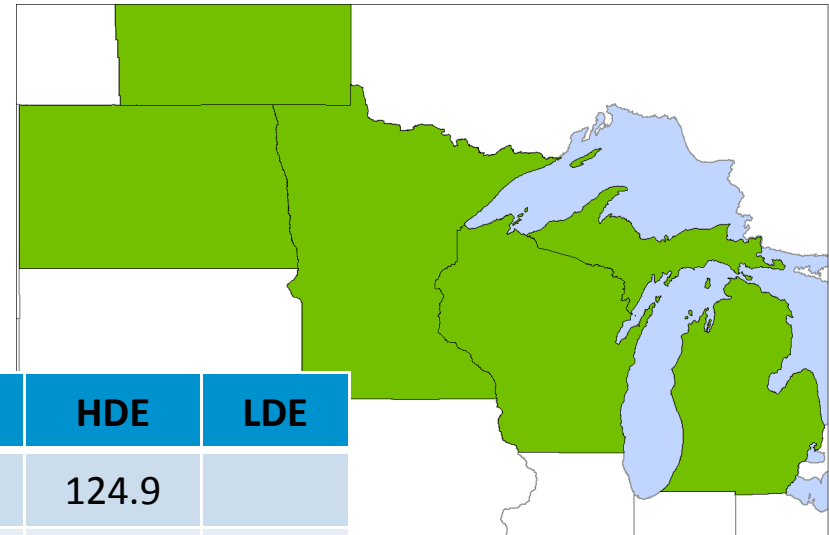
- **The Northern Area Study is exploring the potential associated with three study drivers:**
 - **Load Levels:** Potential addition or subtraction of industrial/mining loads (represented by MTEP futures)
 - **Business as Usual (BAU) – 1.41% demand growth rate**
 - **High Growth (HDE) – 2.12% demand growth rate**
 - **Low Growth (LDE) – 0.71% demand growth rate**
 - **Manitoba Hydro Imports:** Assumes MH-MISO line and new MH generation in-service
 - **No Increased Imports – No New Lines**
 - **Increased Imports – Winnipeg – Duluth 500kV**
 - **Increased Imports – Winnipeg – Fargo 500kV**
 - **Increased Imports – Winnipeg – Duluth/Fargo “T” 500kV**
 - **Presque Isle Retirement**
 - **Plant in-service**
 - **Plant retired**

MISO 24 combinations being considered

Maximum Economic Potential

2027 MISO APC Savings (\$M-2027)

Total MISO potential benefit from relaxing all constraints in NAS footprint



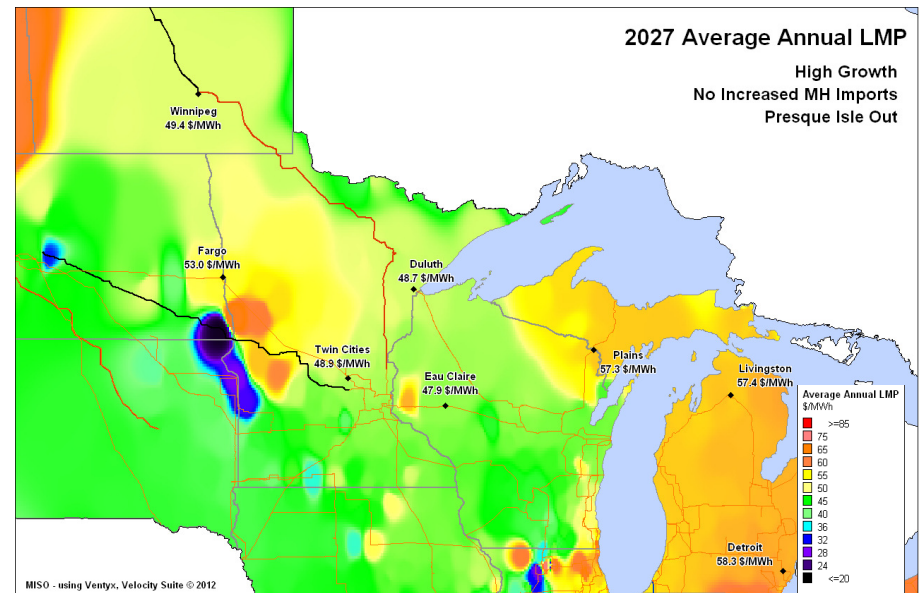
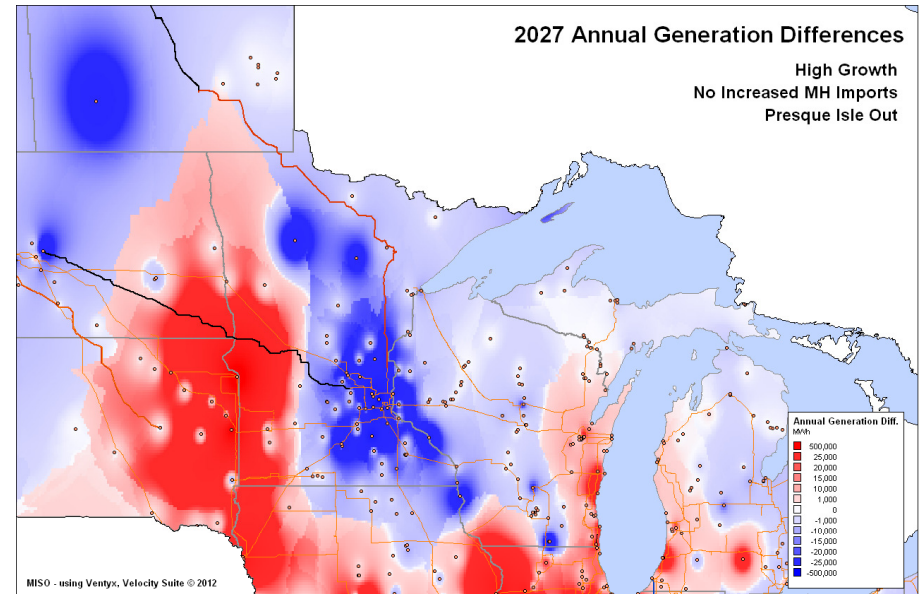
Scenario	BAU	HDE	LDE
No Increased MH Imports, Presque Isle In	31.5	124.9	
No Increased MH Imports, Presque Isle Out	30.1	126.8	5.5
MH Imports Duluth 500kV, Presque Isle In	20.9	113.0	4.7
MH Imports Duluth 500kV, Presque Isle Out	22.6	113.7	5.0
MH Imports Fargo 500kV, Presque Isle In	30.8	107.1	13.2
MH Imports Fargo 500kV, Presque Isle Out	29.9	110.7	12.8
MH Imports "T" 500kV, Presque Isle In	24.4	111.8	4.6
MH Imports "T" 500kV, Presque Isle Out	24.1	117.3	4.1

Ballpark Numbers:
 \$100M in maximum economic potential could justify a \$300M project with a 1.25 B/C ratio



Next Steps

- **Technical Review Group to use economic potential data to design transmission alternatives**
 - Most economically beneficial plans connect export limited areas (red) with import limited (blue)
 - Also bridge high price and low price areas
- **Plans will be screened and refined using both economic and reliability models through an open process**



Study Progress

- **Northern Area Study is following the MISO 7 Step Planning Process that has been used for many of MISO's studies, including MTEP**

- Assumptions finalized at July 11th TRG meeting (Step 1 and Step 2)
- Currently, in Step 3 conceptual transmission overlay design
 - 3rd TRG meeting held Sept. 21 to present economic potential data
 - At the 4th TRG meeting (Nov. 2nd) transmission plans will be collected and formulated for further analysis
- Transmission plans will be evaluated and refined using an iterative process considering both economic benefits and reliability (Nov. 2012 – Feb. 2013)
- All plans and results will be documented in a comprehensive report

