

# UP Energy Summit

Northern Michigan University

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10/10/2013



# UP Energy Summit

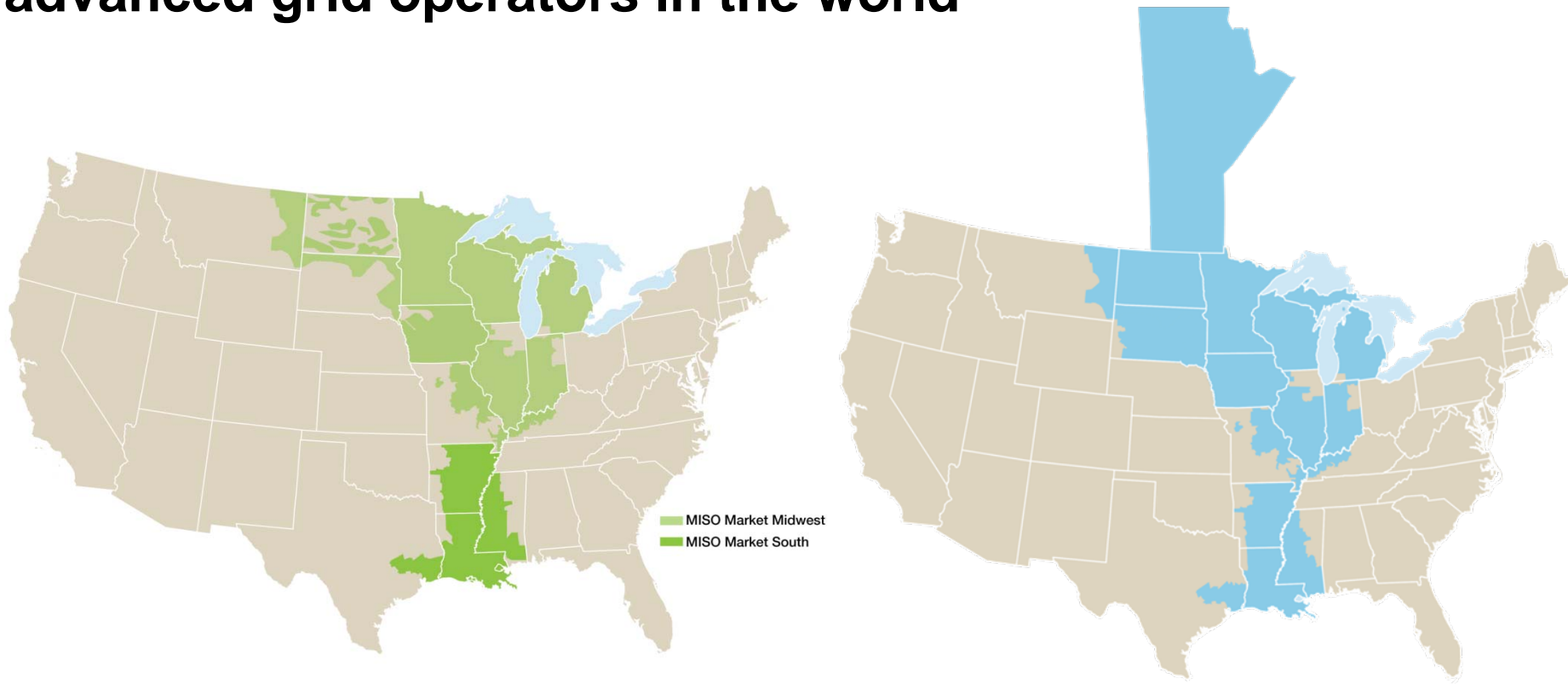
## MISO Hot Topics

Brian Rybarik

# Overview

- **MISO Hot Topics**
  - South Region
  - Value Proposition
  - OMS-MISO Resource Assessment
  - SSR
- **Northern Area Study Update**

# MISO is one of the largest and most technologically advanced grid operators in the world



## Market Footprint<sup>1</sup>

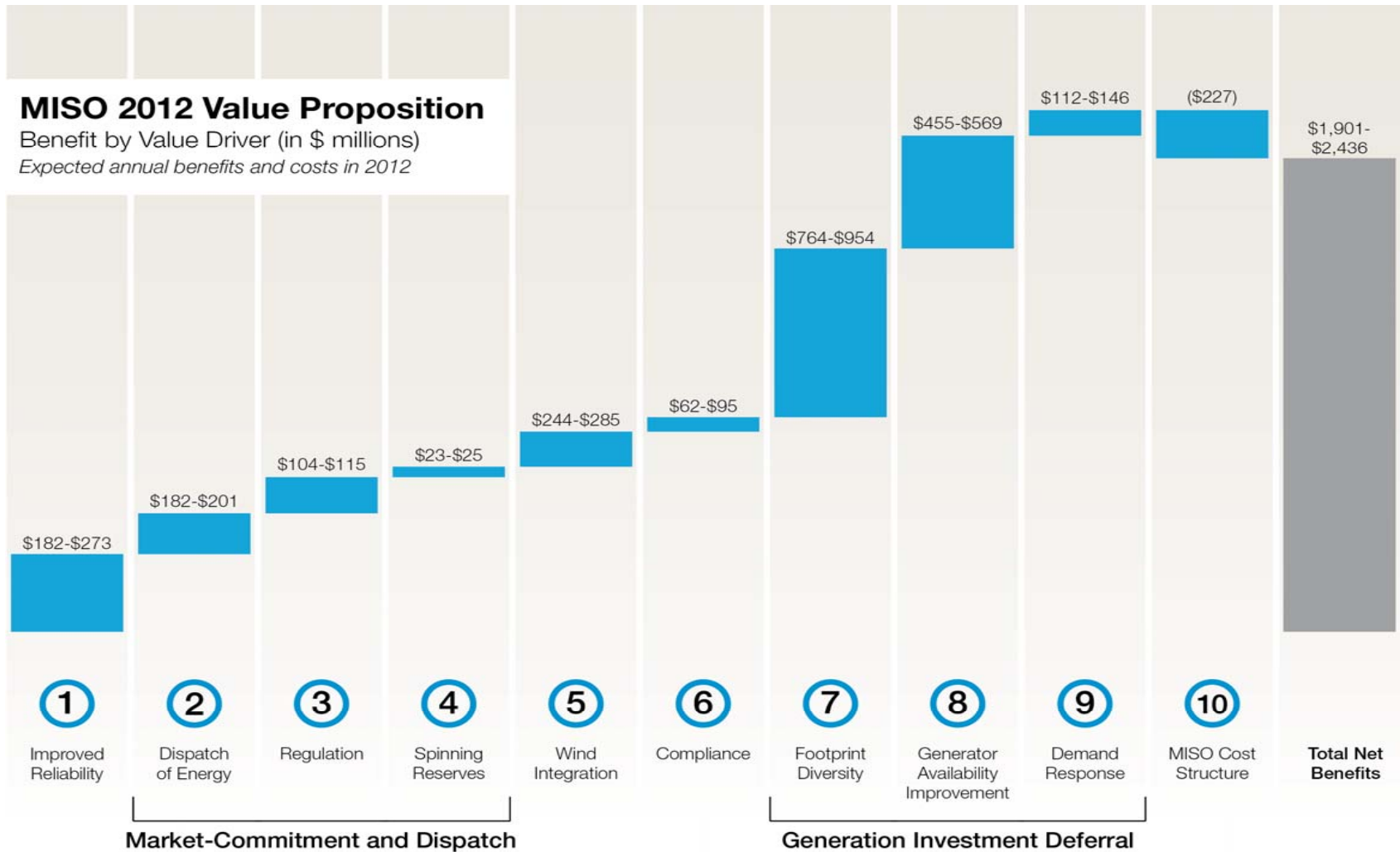
- Generation Capacity = 132,522 MW
- Peak Demand (7/23/12) = 98,576 MW

## Reliability Footprint

- Generation Capacity = 205,759 MW
- Peak Demand (7/23/12) = 133,368 MW

Maintaining reliability on over 65,520 miles of transmission lines in 15 states and the province of Manitoba

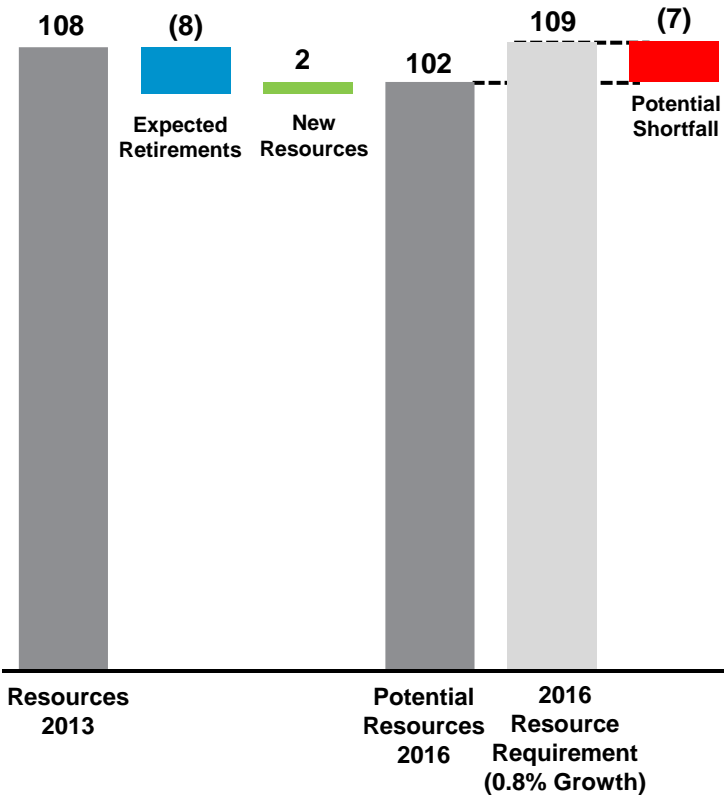
# MISO Value Proposition



# Forecast 2016 resource adequacy is very tight under a moderate (50/50) load forecast scenario

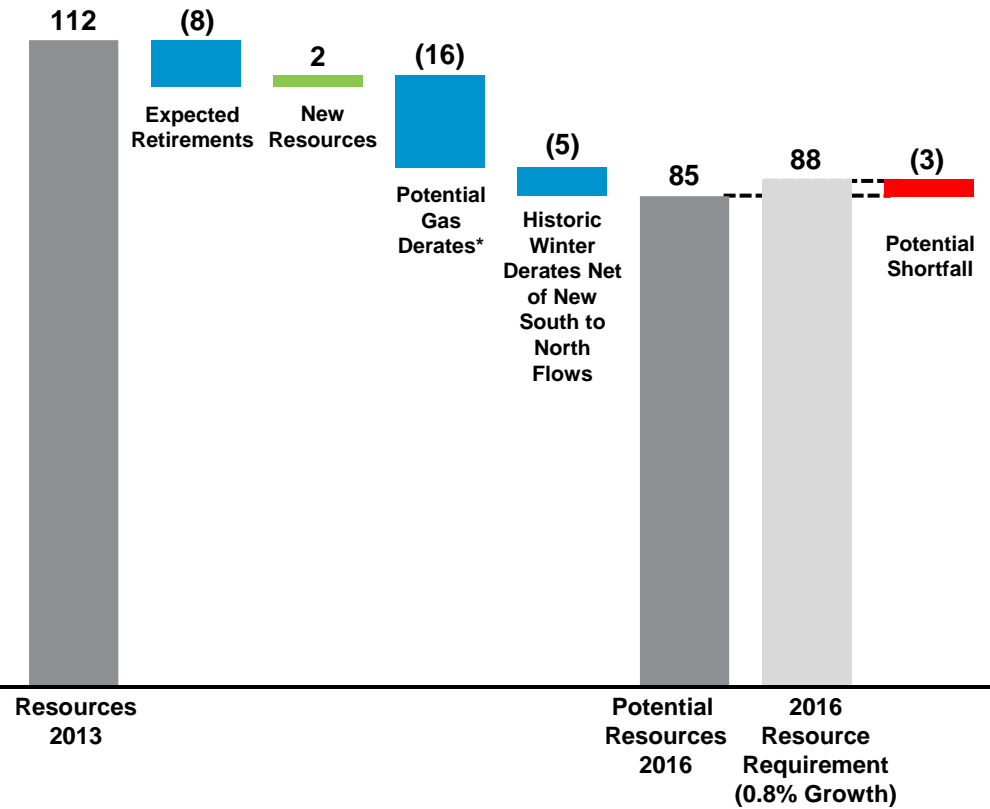
## Summer Resource Adequacy Moderate Load Forecast

2016  
(GW)

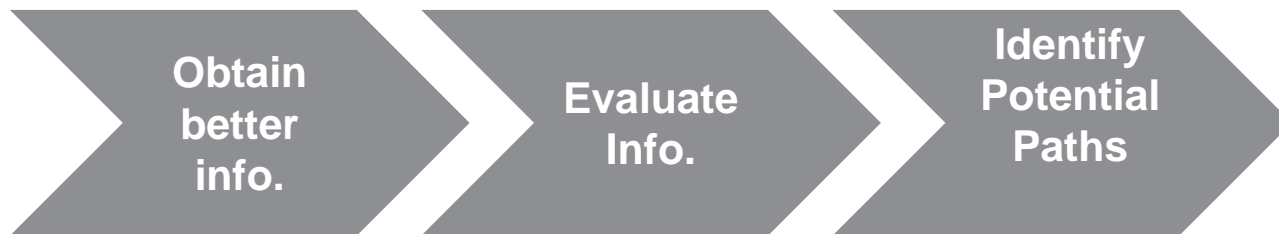


## Winter Resource Adequacy Moderate Load Forecast

2016  
(GW)



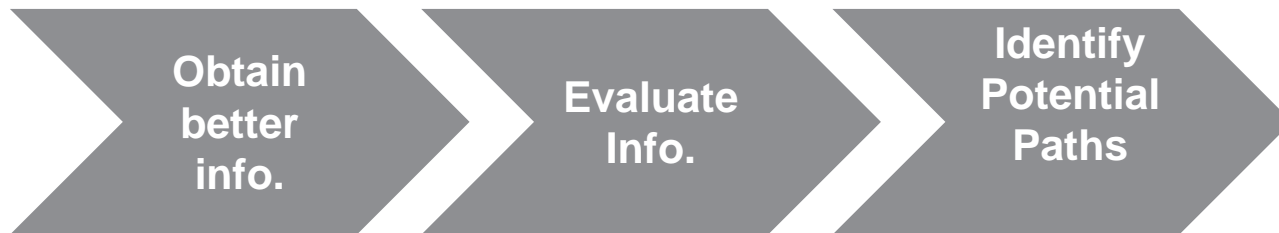
\*Units without firm gas transport or distillate backup



## **OMS-MISO Collaboration to obtain better information on Resource Adequacy**

- OMS and MISO worked together to **develop resource assessment survey**
- Requests information from LSEs on resources and load forecasts
- Unique aspects of request: looking for **certainty factors** to better assess forecasted needs and **resource assumptions**
- MISO sent survey to **145 entities – 324 distinct email addresses**
- **OMS follow-up** to LSEs in individual states
- MISO tracked issues and provided additional information to LSEs (e.g., workshop held on 8/22, issue tracking, etc...)
- Responses were due on 9/20





## **THE SURVEY – What does it seek?**

- Demand: monthly peak expectation for each month/confidence factor (1-5)/forecast error (%)
- Energy: expected annual energy/confidence factor (1-5)/forecast error (in %)
- Existing resources: LBA location/type/summer and winter rating/availability by year (y/n)/confidence level
- New resources: type/location/summer and winter rating/in queue/why needed
- EE/DR: registered/how big/growth rate, profiles/limits/currently in load forecast





*OMS*

## Survey Responses

- MISO received responses from approximately 93% of entities
- Responding Entities Represent approximately 97% of MISO load
- Load forecasts and resources in both MISO Midwest and South Regions
- OMS continuing outreach to obtain additional responses

## Demand

- Some forecasts included transmission losses, some did not
  - The survey requested no transmission losses
  - Where no indication, the assumption will be none are included
- Determine which EE/DR has been netted or not and incorporate submitted EE/DR accordingly
- Account for coincidence to determine MISO coincident peak

## Resources

- Account for PPAs, retrofits, and retirements and new builds appropriately
- Accurately calculate seasonal/annual resource values

## Dissemination of Analysis

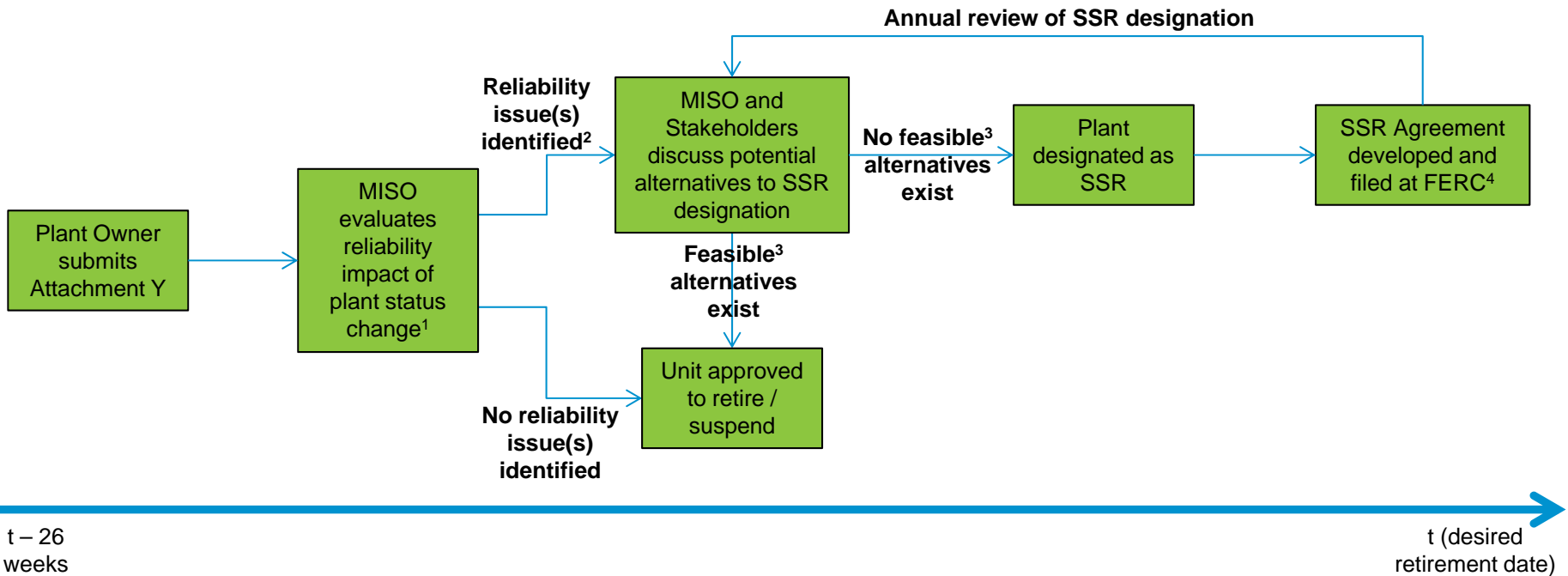
Work to present findings and forward use of data in study sensitivities

# MISO System Support Resource (SSR) Background

- MISO expects EPA regulations to drive an increase in coal-fired generation retirements in the near-term.
- Long-term or permanent loss of a plant can negatively affect MISO's ability to operate the system reliably; therefore, MISO's tariff requires plant owners desiring to suspend or retire a generating unit to obtain approval before taking such action.
- The power plant owner's submission of an application - called Attachment Y - triggers MISO's review and analysis to determine if a System Support Resource (SSR) designation may be necessary.
- An SSR unit is one whose continued availability is required for MISO to operate the system within applicable reliability standards.
- Though tariff provisions have been in place since 2005, the first SSR Agreement wasn't put in place until June 2012, which was primarily precipitated by EPA rule compliance requirements.

# MISO's SSR Process

## System Support Resources for Reliability Purposes



- 1 – At the conclusion of the analysis, the plant owner is given a 5 day period to decide if they want the results or if they will withdraw the request
- 2 – If the request remains active, and reliability issue(s) are found, MISO posts the existence of the reliability need on its OASIS.
- 3 – Feasible alternatives are those that mitigate the reliability issue AND can be implemented prior to the unit's change of status date.
- 4 – If agreement on terms cannot be reached, the SSR Agreement is filed unexecuted.



# System Support Resource Alternatives

- **MISO conducts review of need with Stakeholders to look for alternative solutions**
  - Generation re-dispatch
  - Transmission reconfiguration or special protection schemes
  - Demand response or generation alternatives
  - Transmission upgrades
- **Transmission Owners to develop long term transmission solutions**
  - Transmission upgrades needed for retirement are considered Baseline Reliability Projects
  - Costs for upgrades are allocated to Transmission Customer
- **System reinforcements intended to allow generator to ultimately suspend or retire**

# System Support Resource Contract

- **If unit is needed as System Support Resource, MISO negotiates terms with the asset owner and costs include:**
  - Fixed and variable O&M for existing equipment
  - Taxes
  - Environmental waivers/allowances
  - Capital upgrades for pollution control
- **SSR contracts are one-year duration subject to annual review and renewal**
  - Allow for changes in system conditions or new alternatives to be offered
  - Contracts can be terminated prior to end of contract if new developments occur
- **Cost Allocation – new methodology proposed in Escanaba case**

# Att Y vs Att Y-2

- **Attachment Y applies to a definitive decision to retire/suspend a unit**
- **Generator owner can choose to rescind once study is completed but results are not disclosed.**
- **Attachment Y-2 is a non-binding informational study to allow asset owners to find out if qualified for SSR status**
- **Study provides indication only if issues exist**
- **Do not directly result in SSR contract or system upgrades**
- **Fee-based study**
- **Confidential study**

# Other Key Issues

- **Interesting Enhancements**
  - New LMP Map
  - Use of Smart Grid technology in Real-Time Operations (syncrophasor project)
- **Cyber Security**
- **Emergency Operations**



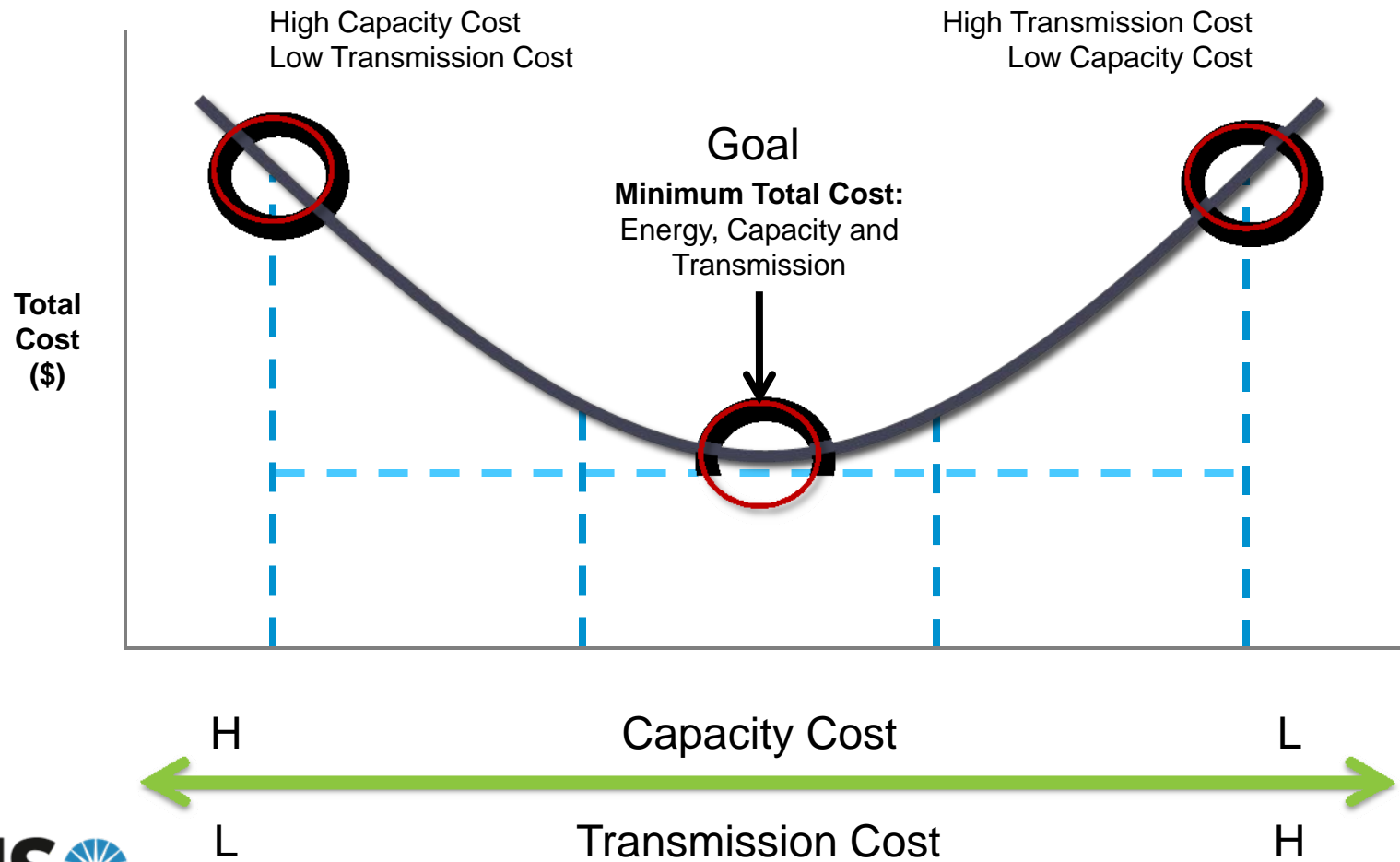


# UP Energy Summit

## MISO Northern Area Study

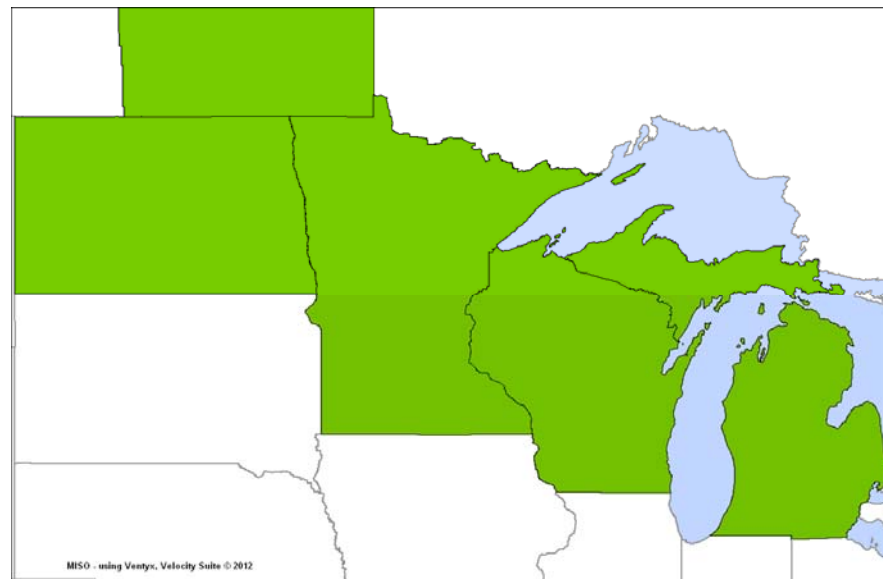
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# MISO's focus is on minimizing the total cost of energy delivered to consumers



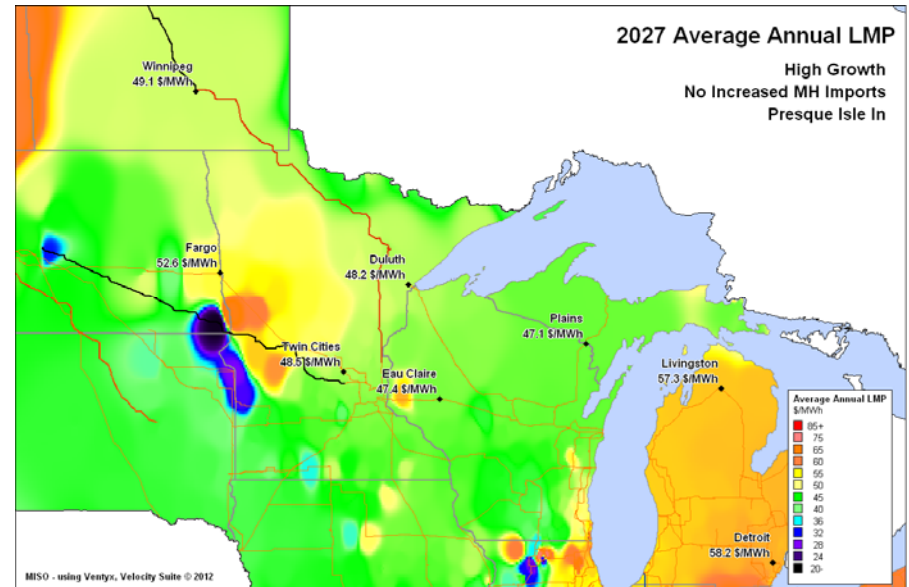
# Northern Area Study

- **Exploratory analysis**
- **Initial analysis began June 2012 and concluded May 2013**
- **Driver: Multiple proposals by stakeholders & reliability issues located in MISO's northern footprint**
- **Objective was to conduct a comprehensive study to:**
  - Identify the opportunities for **increased market efficiency** via transmission development in the area
  - **Evaluate the reliability & economic effects** of drivers on a regional, rather than local, perspective
  - Identify the most valuable indicative proposal(s) & screen for **robustness**
- **2012 - 2013 analysis will provide guidance for next steps**



# What makes the *Northern Area* unique?

- Large potential for new and increased mining and industrial demand
- Proposed expansion of import capabilities from Manitoba Hydro
- Strong wind generation potential
- Local availability of generation fuel sources – relatively low cost thermal units
- Limited electrical interconnections to the Upper Peninsula of Michigan

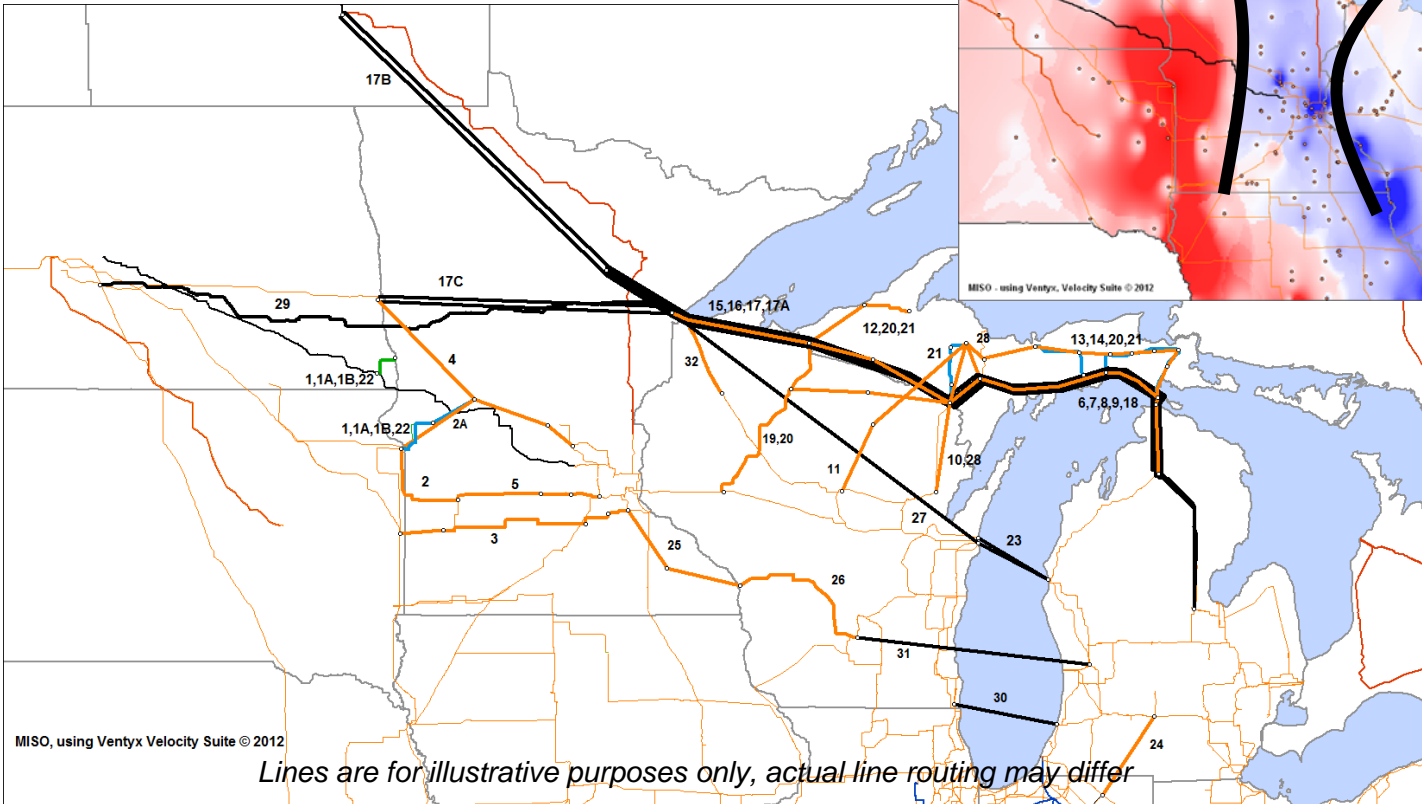
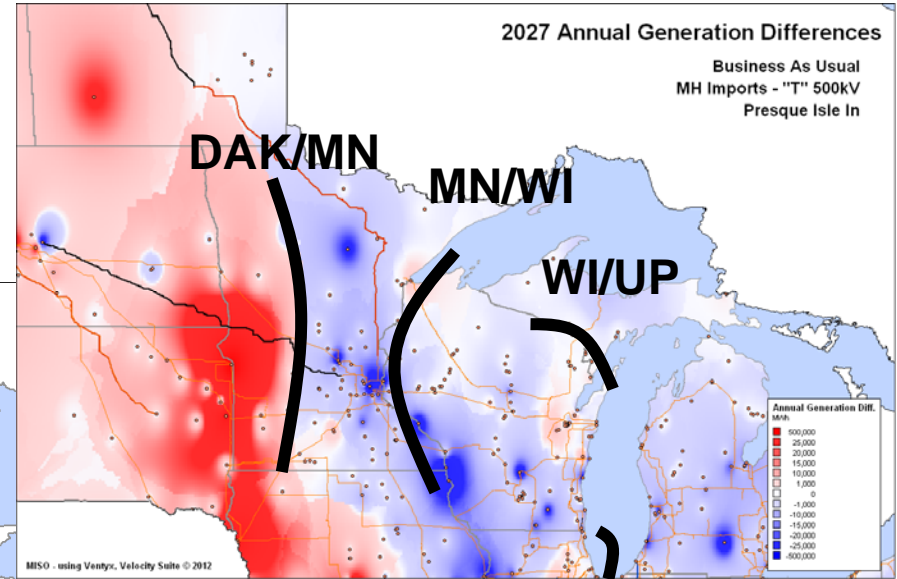




# Northern Area Study Input Assumptions

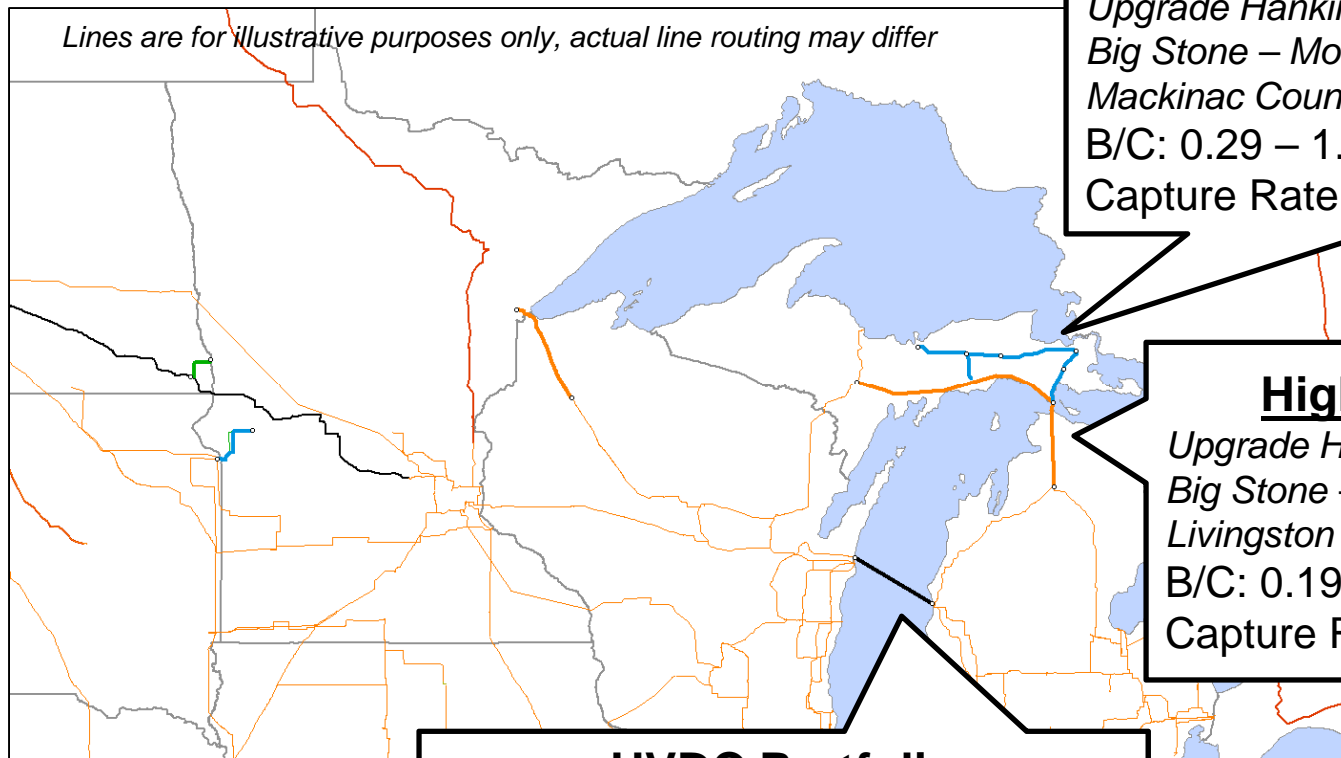
- **Multiple scenarios used to bookend uncertainty and understand how drivers interact**
- **Industrial Load Levels**
  - Business as Usual
  - High Demand and Energy
    - +1000 MW in Williston, North Dakota area
    - +300 MW in the Upper Peninsula of Michigan
    - +300 MW in northern Minnesota
  - Low Demand and Energy
- **Manitoba Hydro**
  - +1,100 MW of MISO imports via 3 different 500kV paths
- **Presque Isle Plant in-service – original status was uncertain**

# 38 options analyzed to determine most cost-effective transmission solutions to mitigate 3 congestion interfaces



# Most cost-effective transmission options combined to 3 portfolios

Lines are for illustrative purposes only, actual line routing may differ



## Low Voltage Portfolio

Upgrade Hankinson – Wahpeton 230kV & Big Stone – Morris 115kV, Marquette – Mackinac County 138kV, (MWEX)  
B/C: 0.29 – 1.22  
Capture Rate: 50 - 68%

## High Voltage Portfolio

Upgrade Hankinson – Wahpeton 230kV & Big Stone – Morris 115kV, Arnold – Livingston 345kV, (MWEX)  
B/C: 0.19 – 0.74  
Capture Rate: 61 - 86%

## HVDC Portfolio

Upgrade Hankinson – Wahpeton 230kV & Big Stone – Morris 115kV, Kewaunee – Ludington 500kV DC, (MWEX)  
B/C: 0.21 – 0.72  
Capture Rate: 94 – 100+%

# Northern Area Study Takeaways

- Under the Northern Area Study business as usual conditions, large-scale regional transmission expansion in MISO's northern footprint is not cost-effective based on production cost savings
- With Presque Isle staying online, the economic potential for new Upper Peninsula transmission lines is decreased
- There are economic opportunities to mitigate the remaining out-year congestion – best solutions appear to be sub-345kV
- Equalizing Michigan LMPs yields economic savings, however; production cost benefits did not exceed costs in tested conditions



# Going Forward from the Northern Area Study

- **The Northern Area Study provides a prioritized and shortened list of options for future studies if assumptions about future conditions or needs change**
  - Most cost-effective options have been handed-off to other MISO studies, which is ongoing
- **The Northern Area Study makes no conclusions regarding the broader multi-value benefits that might be achieved, or the need for future localized reliability upgrades**

# Next Step – Northern Area Study Phase II

- **Driver: Potential suspension of the Presque Isle Power Plant**
- **Scope under development**
  - MISO working with state political leaders
- **Study would expand on Phase I**
  - Generation retirement scenarios
  - Greater emphasis on reliability planning

# Additional Information

- **Project Report:**

- <https://www.misoenergy.org/Library/Repository/Study/MTEP/MT-EP13/Northern%20Area%20Study%20Final%20Report.pdf>

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