

MISO Update

Missouri Public
Service
Commission

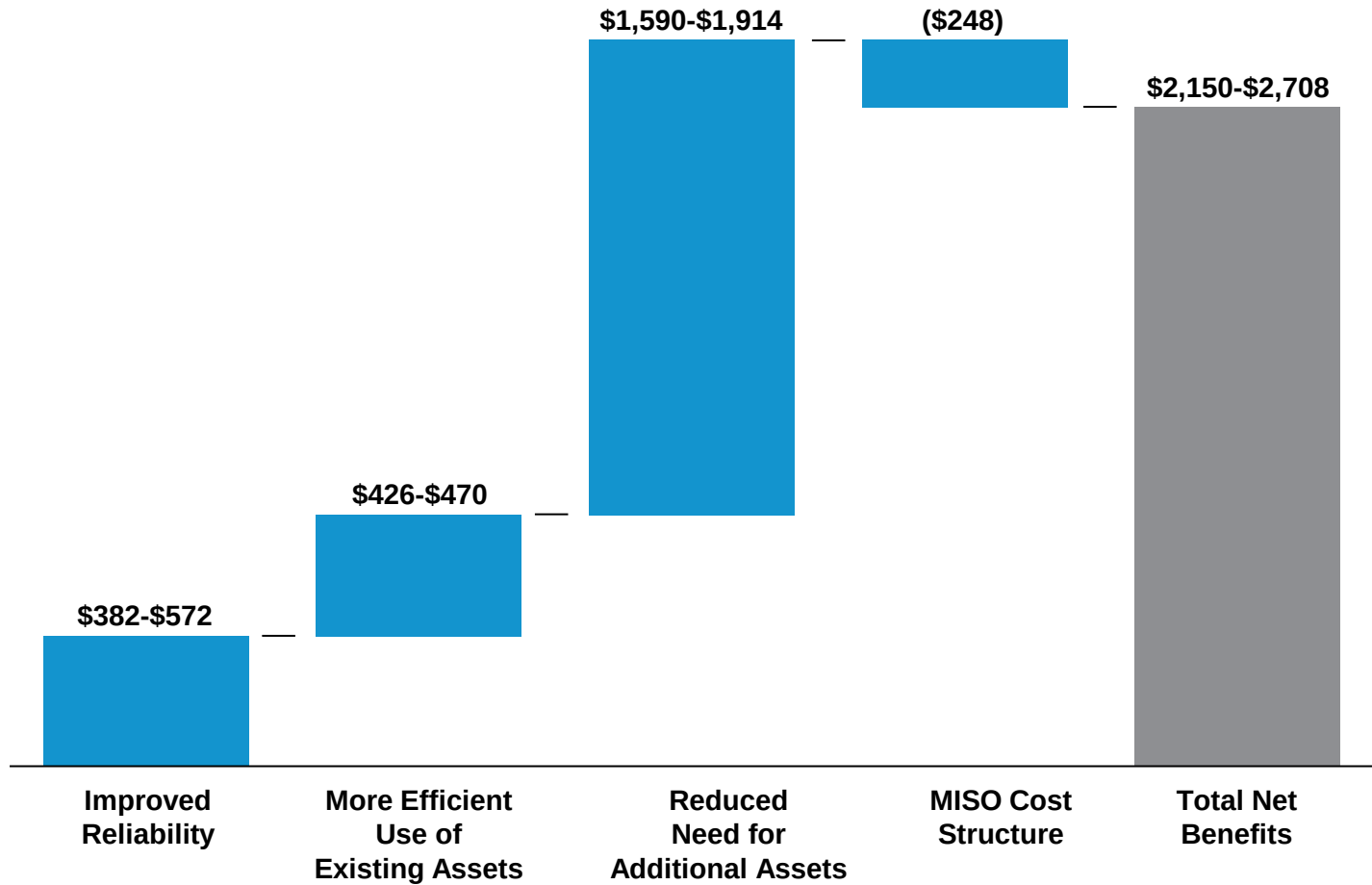
January 25, 2012

Discussion Overview

- 2011 Value Proposition: \$2.2 - \$2.7 billion in net delivered benefits
- Environmental regulations pose a serious threat to the deliverability of reliable, low-cost energy
 - Plant closings will reduce the reserve margins below reliable levels
 - Significant investment (\$31 Billion) is required to retrofit or replace resources
 - Fuel mix change will increase price and price volatility
 - Outage of 61 GW of resources
- To mitigate these impacts three key actions are required
 - Revise existing tariff and procedures – retirement analysis; outage coordination
 - Construct sufficient transmission to allow delivery of available resources
 - Eliminate administrative / seams barriers to delivery of available resources

The MISO 2011 Value Proposition

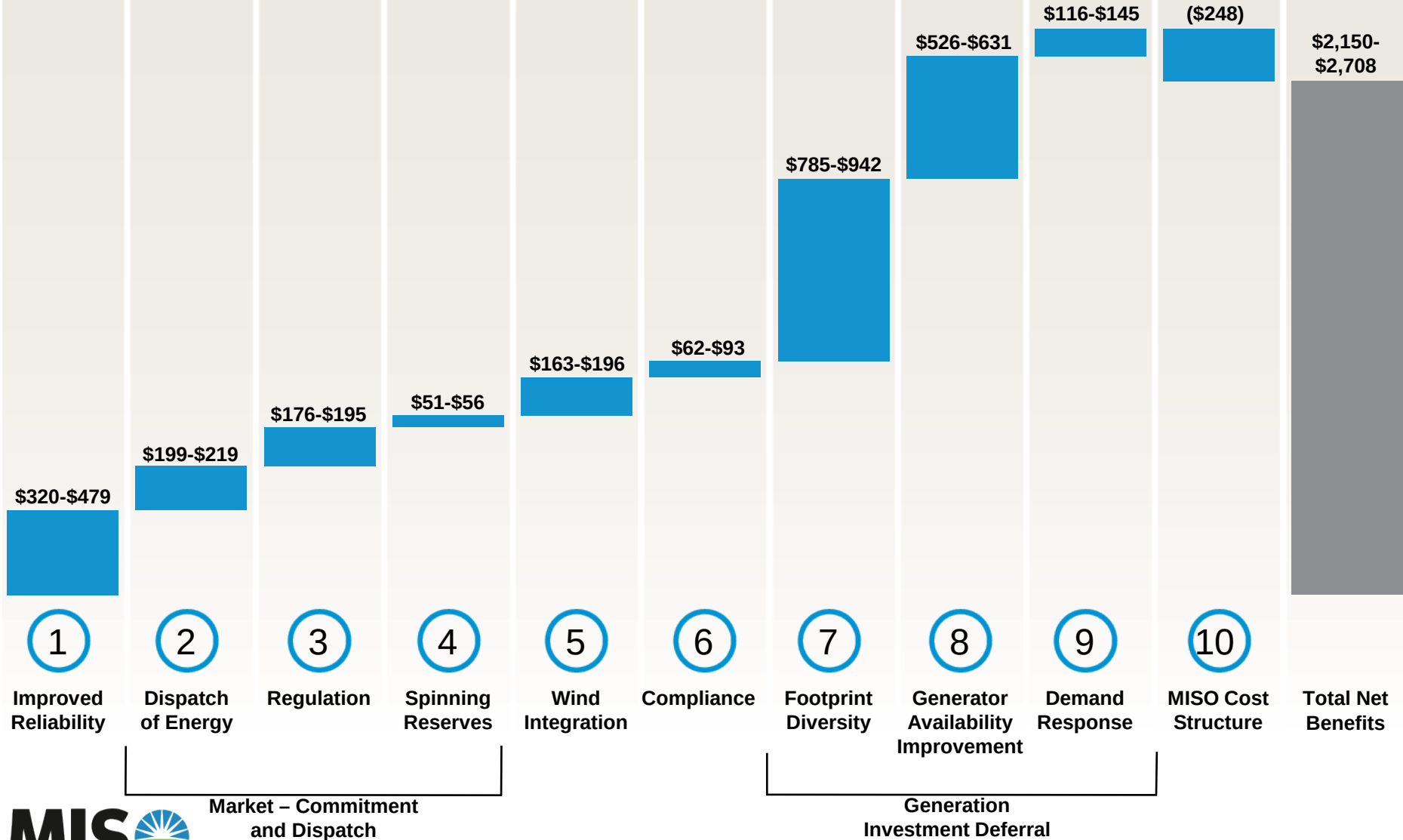
Benefit by Value Driver¹
(in \$ millions)



¹Figures shown reflect annual benefits and costs that can be expected in 2011

The MISO 2011 Value Proposition

Benefit by Value Driver¹
(in \$ millions)



Market – Commitment and Dispatch

Generation Investment Deferral

¹Figures shown reflect annual benefits and costs that can be expected in 2011

EPA Regulations –

MISO has conducted an in-depth study of the regional impacts

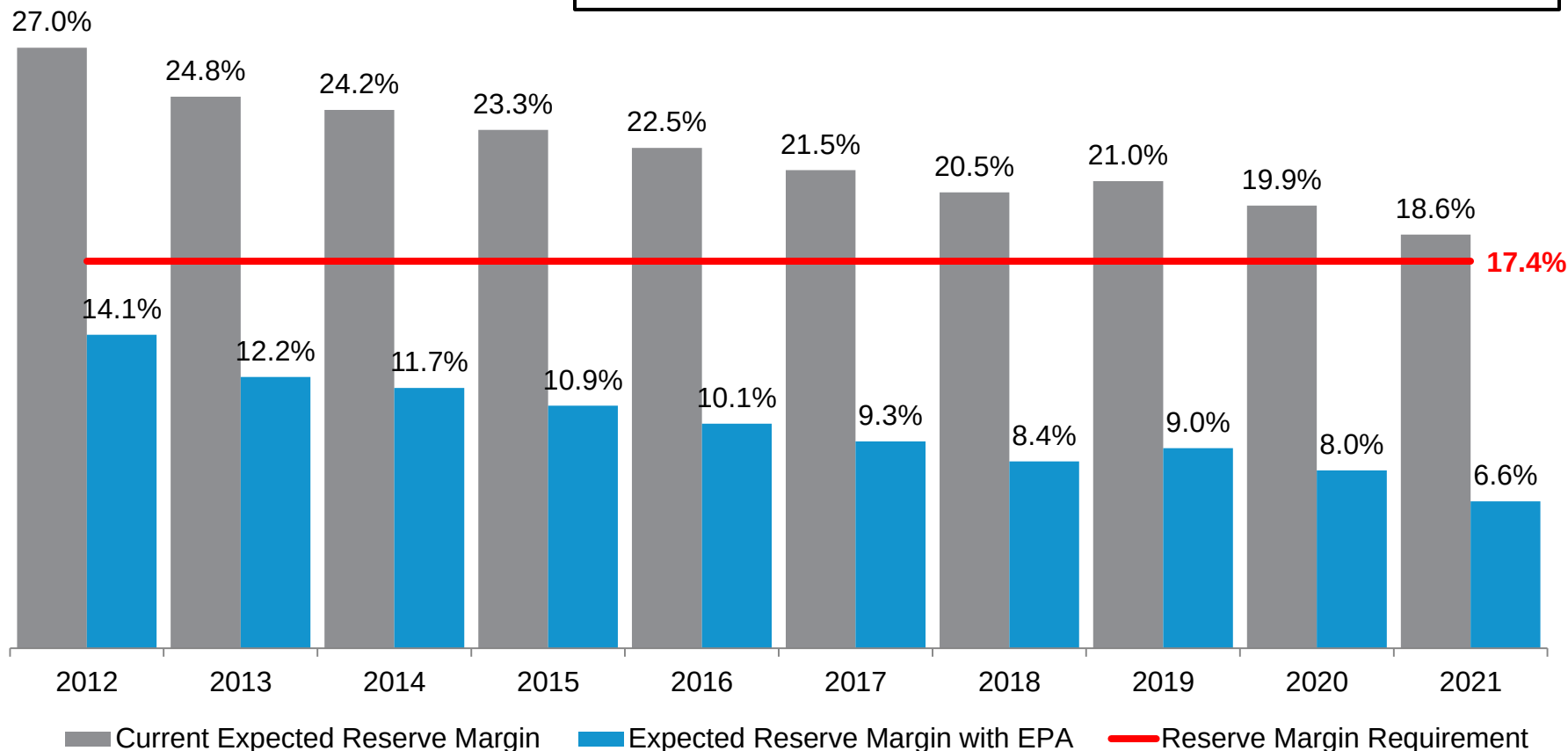
- Study considered four regulations:
 - Cross State Air Pollution Rule
 - Mercury and Air Toxics Standards
 - Clean Water Act
 - Coal Combustion Residuals
- 348 Generation Units / 76.5 GW are affected
- 13 GW of capacity is identified as “at risk” with 3 GW likely to retire
 - Capital investment in excess of \$31B required to retrofit and/or replace units
 - Wholesale energy prices will increase \$1 - \$5 / MWh
 - 10 GW of new resources required by 2016 to maintain planning reserve margin

Outage coordination is the most significant short-term challenge



Expected retirements would immediately put MISO region below estimated resource margin requirements

- Simultaneous outages required to retrofit or replace 61 GW
- \$1 - \$5 per MWh energy cost increase; \$31B capital cost





MISO generation retirement process is not designed to accommodate significant short-term retirements

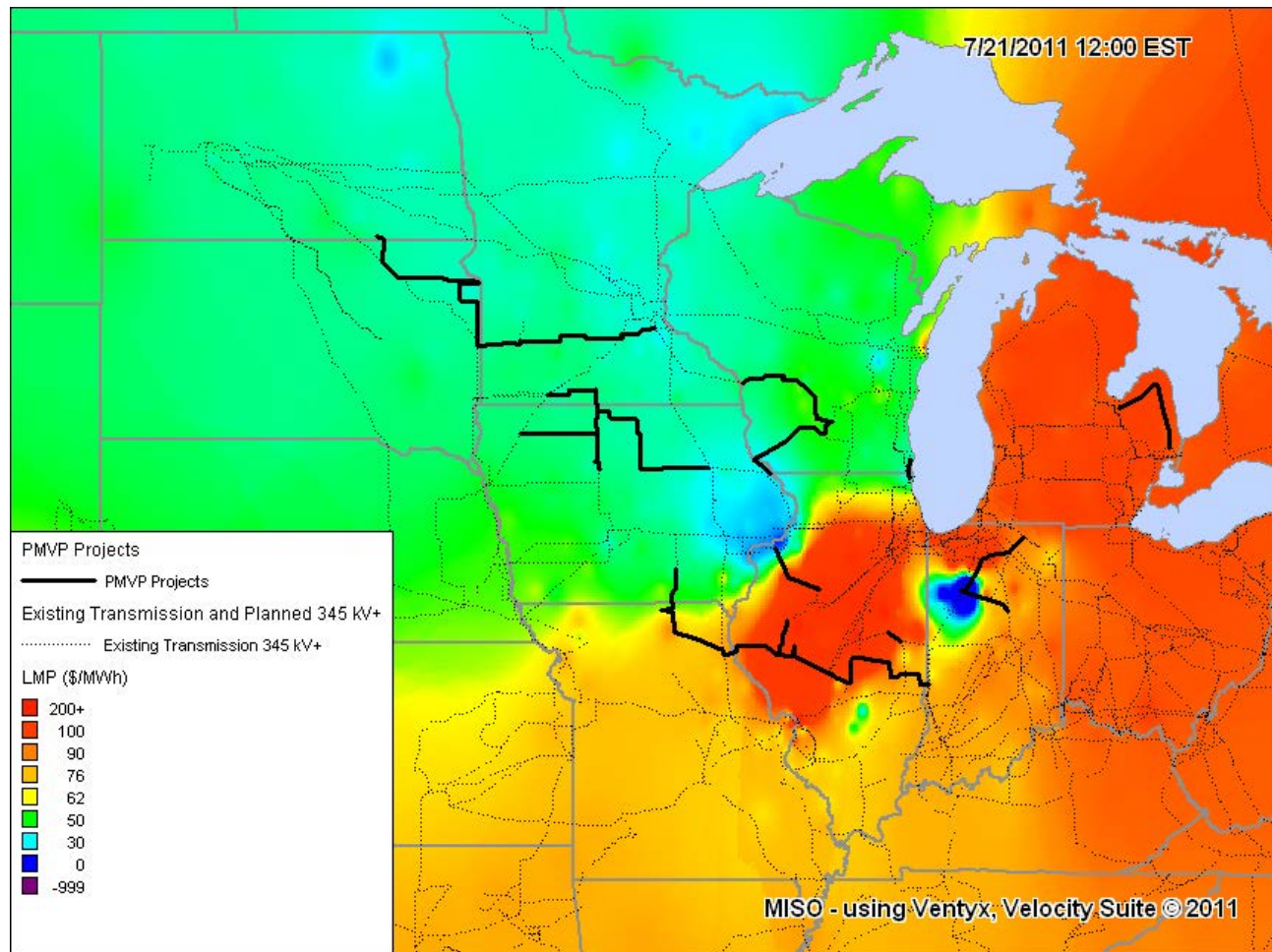
Existing process for generator retirements

- Owner must notify MISO of intent to retire/mothball
- MISO evaluates potential for reliability impacts; local reliability issues, not resource adequacy issues
- If reliability issues are identified
 - MISO attempts to solve with transmission
 - OR
 - MISO designates unit(s) as a System Support Resource (SSR) and MISO tariff compensates unit to stay on line

Mitigation actions under consideration with stakeholders

- Work with membership to collect current compliance plans
- Make tariff revisions
 - Clarify exclusion of generator investment costs from recoverable costs
 - Address resource adequacy reliability impacts of high volume retirements/suspensions
 - Clarify studies that can be performed and unit obligations to abide by decisions
- Refine scenario analysis to understand planning implications

The elements of the Multi-Value Project (MVP) portfolio work together with existing lines to relieve constraints, enabling the efficient delivery of low cost energy throughout the region



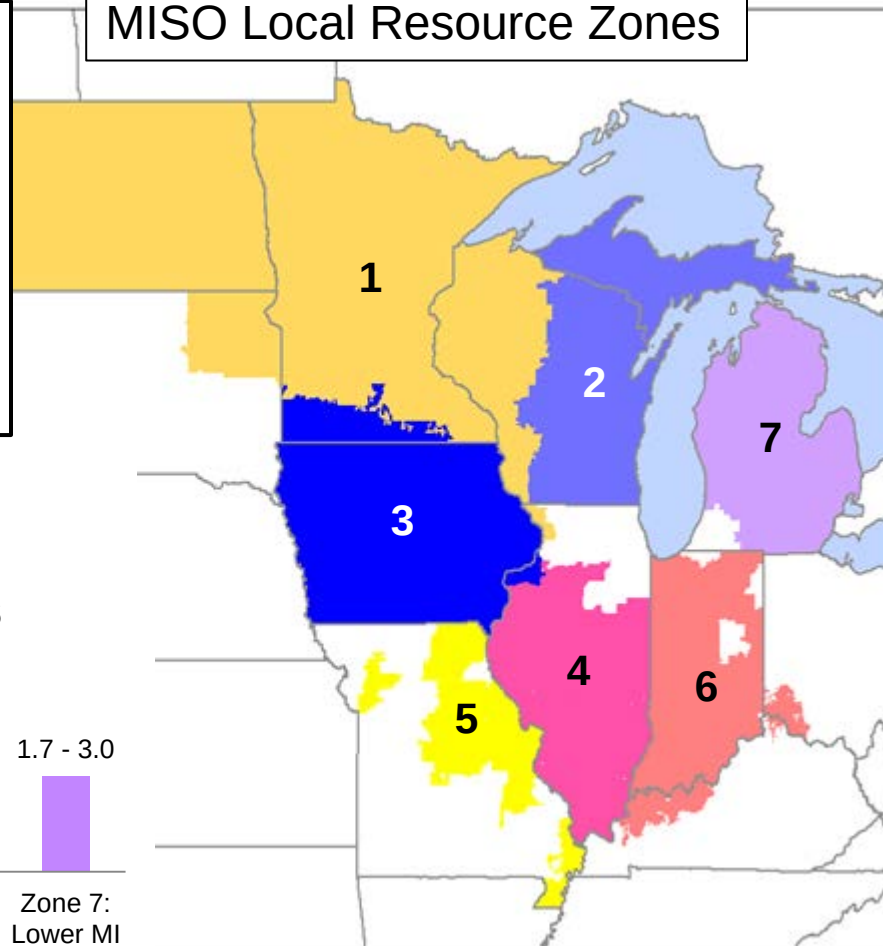


The MISO Board approved the Multi-Value Project portfolio on December 8, 2011

Multi-Value Project Portfolio

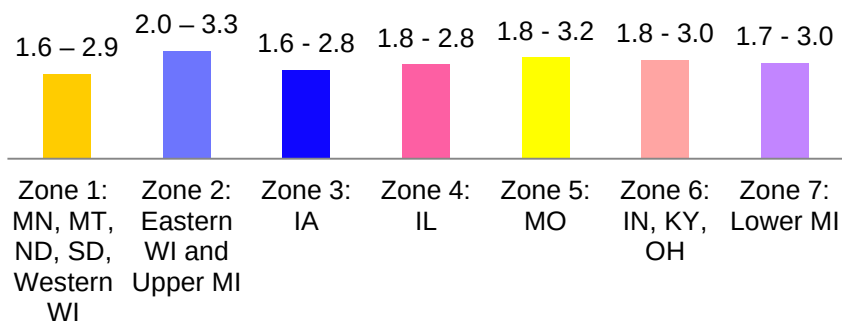
- Total net benefit of \$6.7 to \$32.8 billion over a 20 – 40 year life
- Provides annual value of \$1.3 B vs. cost of \$0.6 B
- Total portfolio construction cost of \$5.2 billion
- 17 elements in the MVP portfolio
- Resolves 650 elemental reliability issues

MISO Local Resource Zones

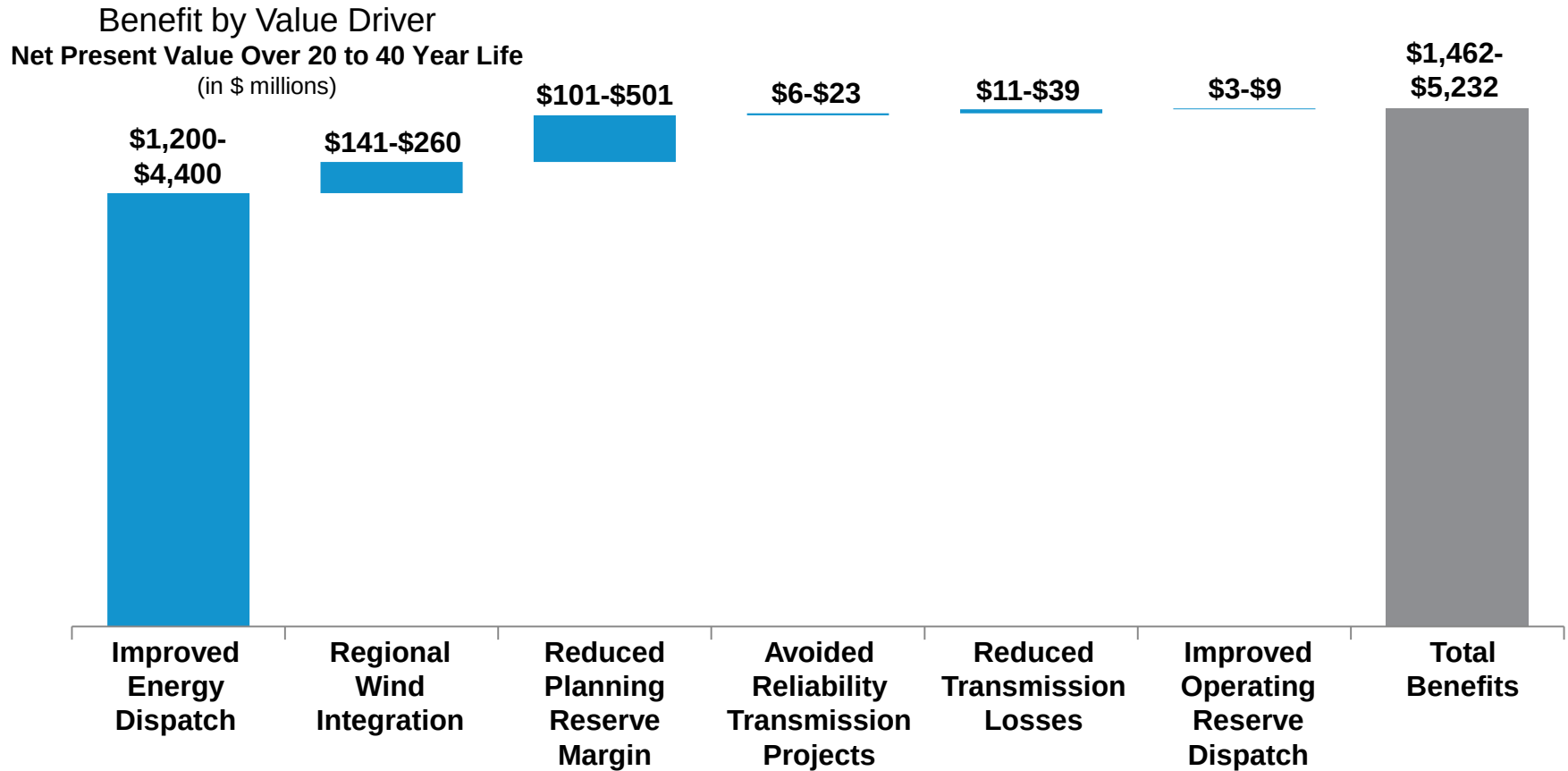


Benefit/Cost Ratio Ranges

Local Resource Zones



Multi-Value Projects - Benefits to Missouri



Projects will also create thousands of jobs for Missouri

- 1,600 – 3,800 direct (construction) jobs
- 2,700 – 7,000 total jobs including construction, supplier and other downstream opportunities

Capacity Deliverability Overview

“AS IS”

Within RTO

Between RTOs

“SHOULD BE”

Within RTO

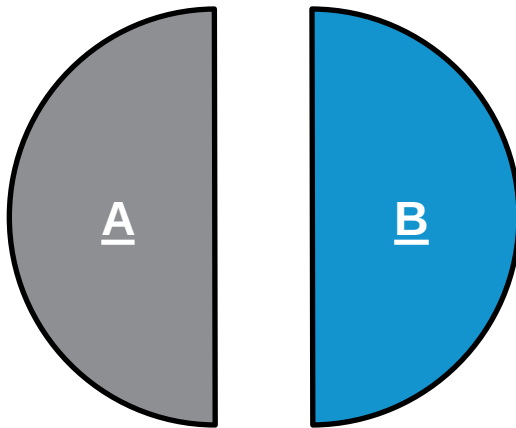
Between RTOs

Methodology:

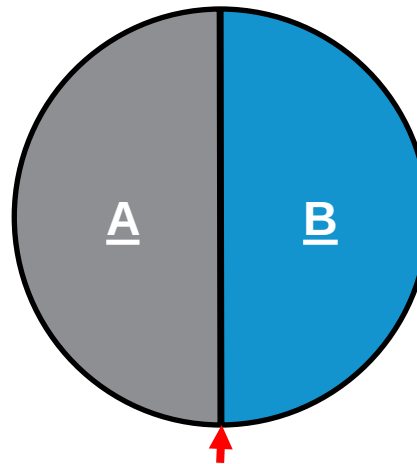
- Simultaneous Deliverability

- Incremental Deliverability

- Simultaneous Deliverability

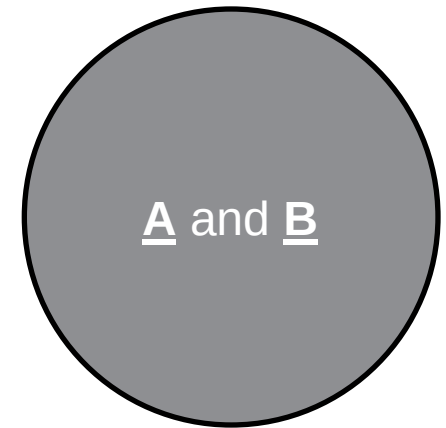


All resources within a single RTO (A or B) loaded at the same time



Membership Border / Seam

All resources in “A” loaded then incrementally review those in “B”



All resources within AND between RTOs (A and B) loaded at the same time

Preliminary analysis indicates an additional 4,000 – 6,000 MW of capacity transfer capability

- **Reliability** – removal of administrative barriers will provide additional flexibility to deal with required outages
- **Market Efficiency** – common methodologies will allow for the utilization of assets and price convergence at the seam (estimated value - \$1.5B per year)
- **Price Transparency** – price transparency and convergence will assist policymakers and stakeholders as decisions are evaluated
- **Next Steps**
 - FERC technical conference to review the issue
 - MISO and PJM to work towards resolution

Entergy Integration – Full Entergy integration expected by December 2013

- All required regulatory approvals should be in place by Q3 2012
- Market training is underway with Entergy and affected parties
- Technical integration is proceeding on schedule
- MISO exploring assumption of Entergy Independent Coordinator of Transmission role from SPP in November 2012
- Memorandum of Understanding is in place to ensure cost recovery



Conclusion

- MISO worked with OMS to deliver significant value in 2011: \$2.2 - \$2.7 billion
- Environmental regulations are going to have a significant impact on the MISO region and its consumers
 - Reduced reserve margin levels
 - Significant (\$31B) capital investment
 - Increased energy costs (\$1-\$5 per MWh) and volatility
- EPA compliance will require coordinated efforts
 - Outage of 61 GW of resources
 - Multi-Value Projects will reduce the price and reliability impacts
 - Resource deliverability can help ease the transition into EPA compliance
 - To take advantage of resource deliverability, federal regulators should direct regional transmission organizations to eliminate artificial interregional barriers to all resources