



Americans for a
Clean Energy Grid

Regional Transmission Webinar Series

Great Plains/Upper Midwest

Who we are and what we do:

We support policies that modernize the nation's electric power network and unlock clean energy and economic opportunities across the country. We believe that the backbone of a clean electricity system and a strong economy is a resilient and reliable transmission grid. Smart state and federal policies that improve the way the grid is developed, planned, and paid for will help it become a more robust, reliable, and secure network that supports expansion of renewable energy, competitive power markets, energy efficiency, and lower costs for consumers.

Upcoming Events

Gulf Coast Electricity Transmission Summit

October 16 at Tulane University

New Orleans, Louisiana

Past Events

Oregon (Pacific Northwest) 2010

Iowa (Midwest) 2010

Kansas (Heartland) 2011

Massachusetts (New England) 2012

Ohio (PJM-Interconnection) 2012

Nashville (Southeast) 2012

Denver (Rocky Mountain) 2013

Minnesota (Great Plains) 2013

Regional Transmission Webinar Series

- Pacific Northwest (*Concluded*)
- Midwest (*Concluded*)
- Heartland – (*Concluded*)
- New England – (*Concluded*)
- PJM – (*Concluded*)
- Southeast – (*Concluded*)
- West – (*Concluded*)
- Great Plains/Upper Midwest - (*Today*)
- Gulf Coast – (*To Be Determined*)
- National - (*To Be Determined*)

A large, light grey sunburst graphic is centered on the page. It features a central white circle with several grey triangular rays extending outwards, creating a semi-circular shape. The rays are of varying lengths and are separated by thin white gaps.

FERC Order 1000 & Other Transmission Challenges

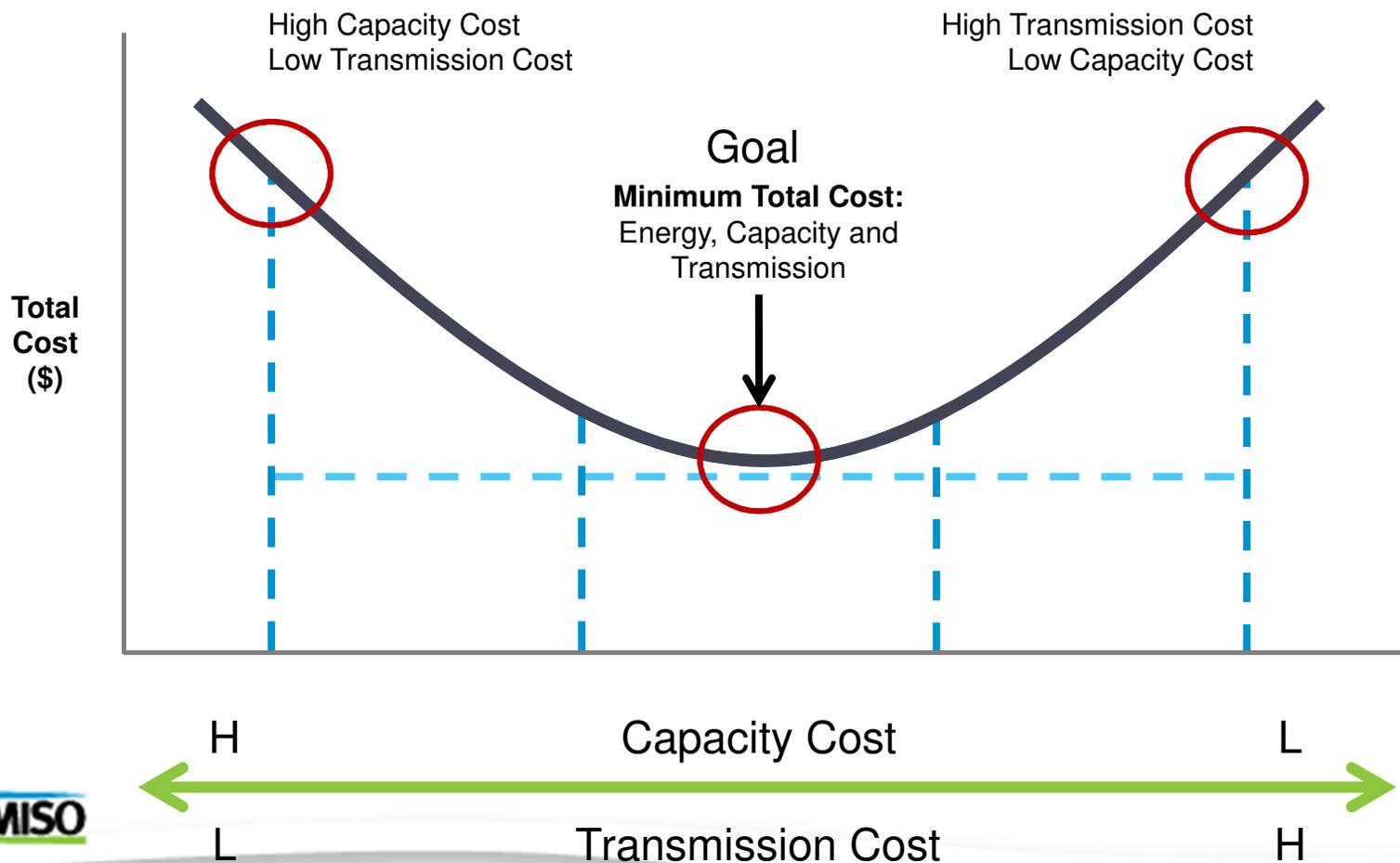
Jesse Moser
Great Plains/Upper Midwest Transmission Webinar
September 4, 2014

Integrated and Coordinated Processes

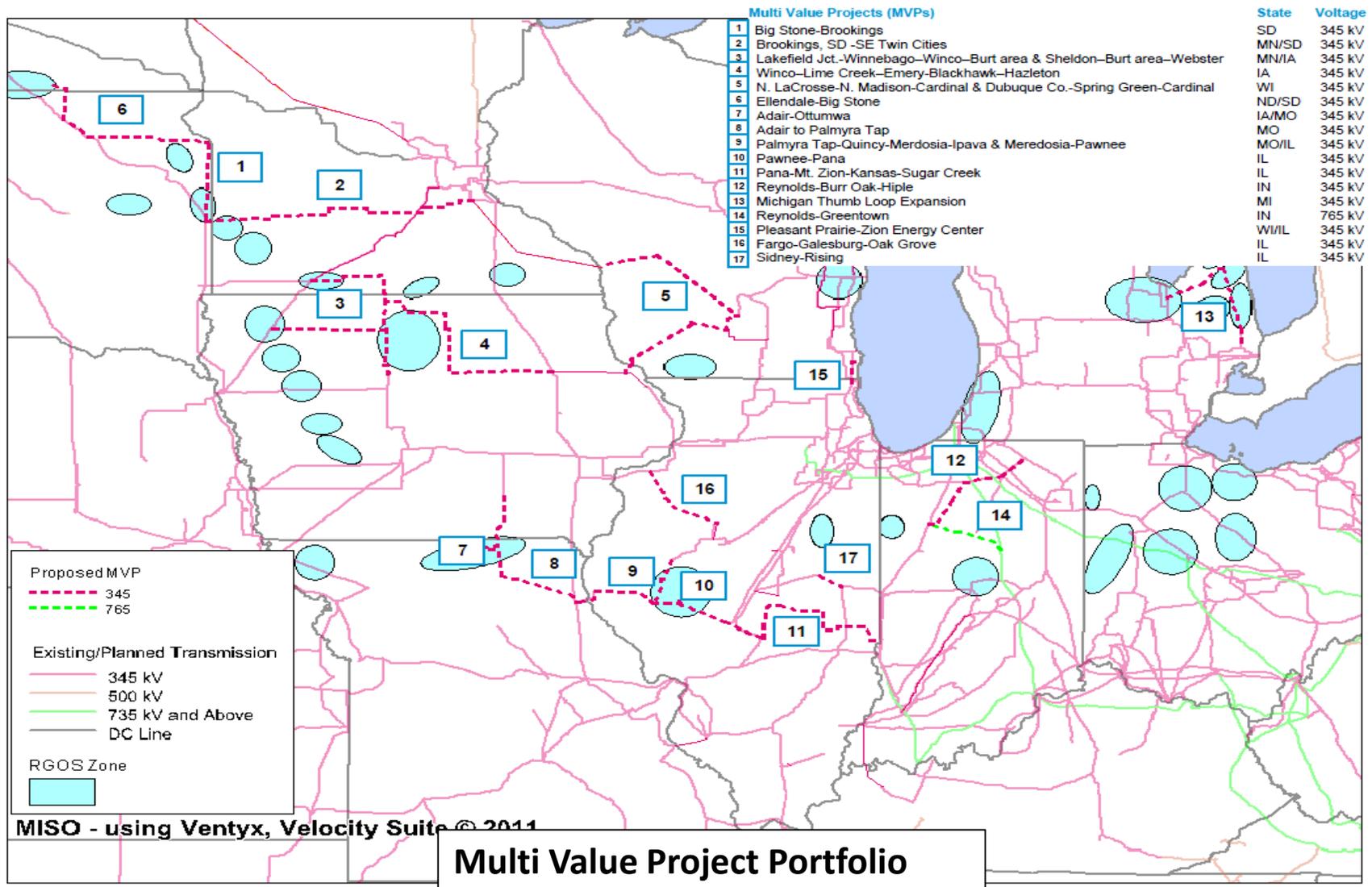


Access Planning includes both the long term Transmission Service Queue and the Generator Interconnection Queue.

Focus is on minimizing the total cost of energy delivered to consumers

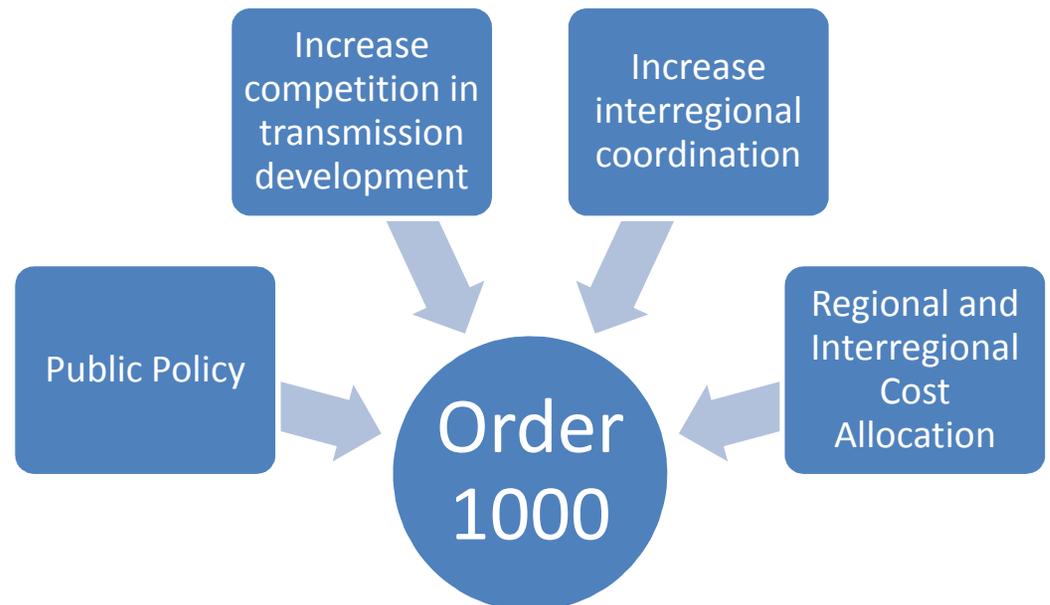


MISO Planning Process and Cost Allocation is consistent with Order 1000 requirements



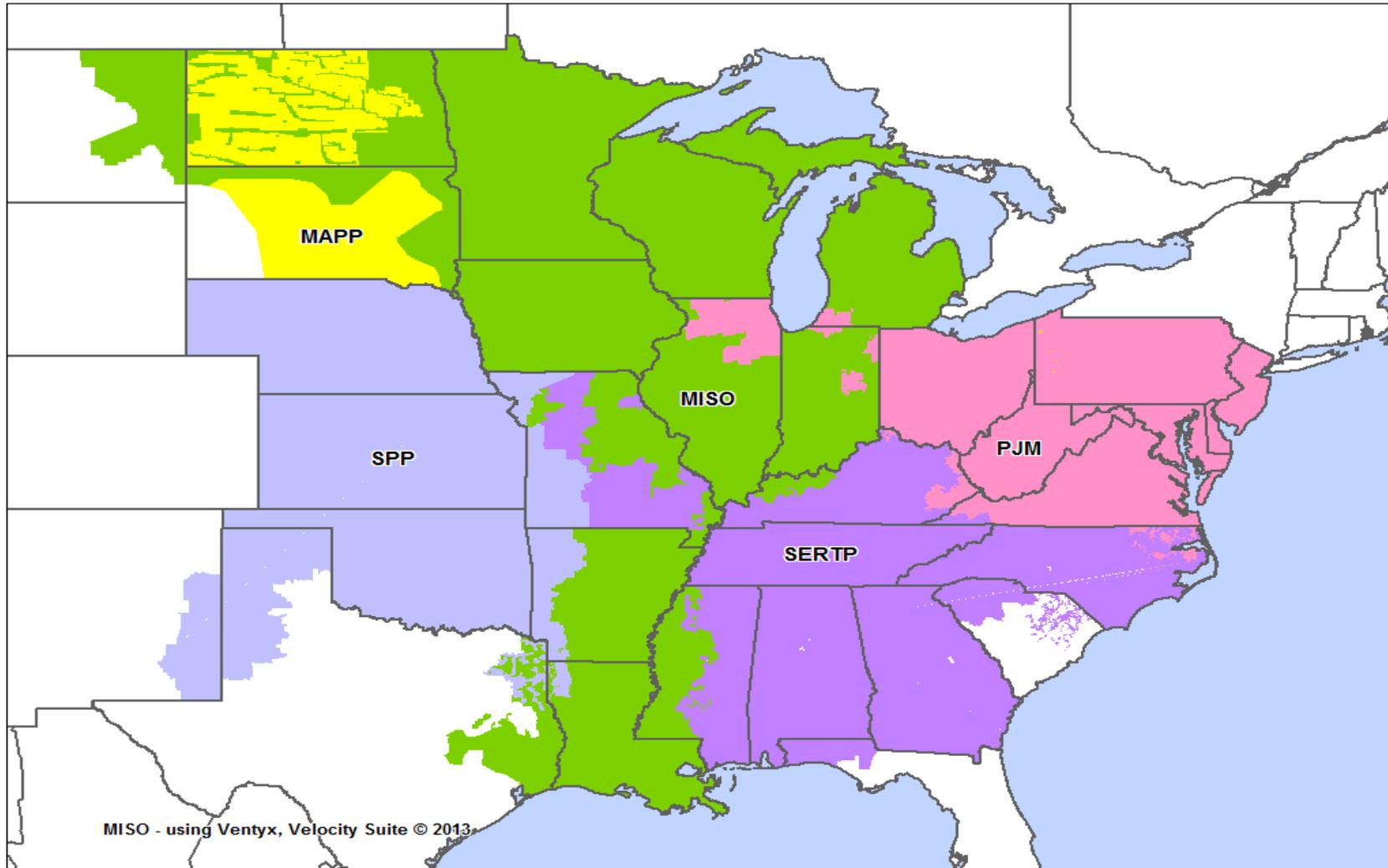
Order 1000 Background

- Seeks to address:
 - Inadequacies of Order 890
 - Changing industry conditions
 - Need for more efficient and cost-effective planning
 - Perceived opportunities for undue discrimination
- Required two compliance filings:
 - Regional
 - Interregional



FERC, through Order 1000, seeks to promote the above initiatives

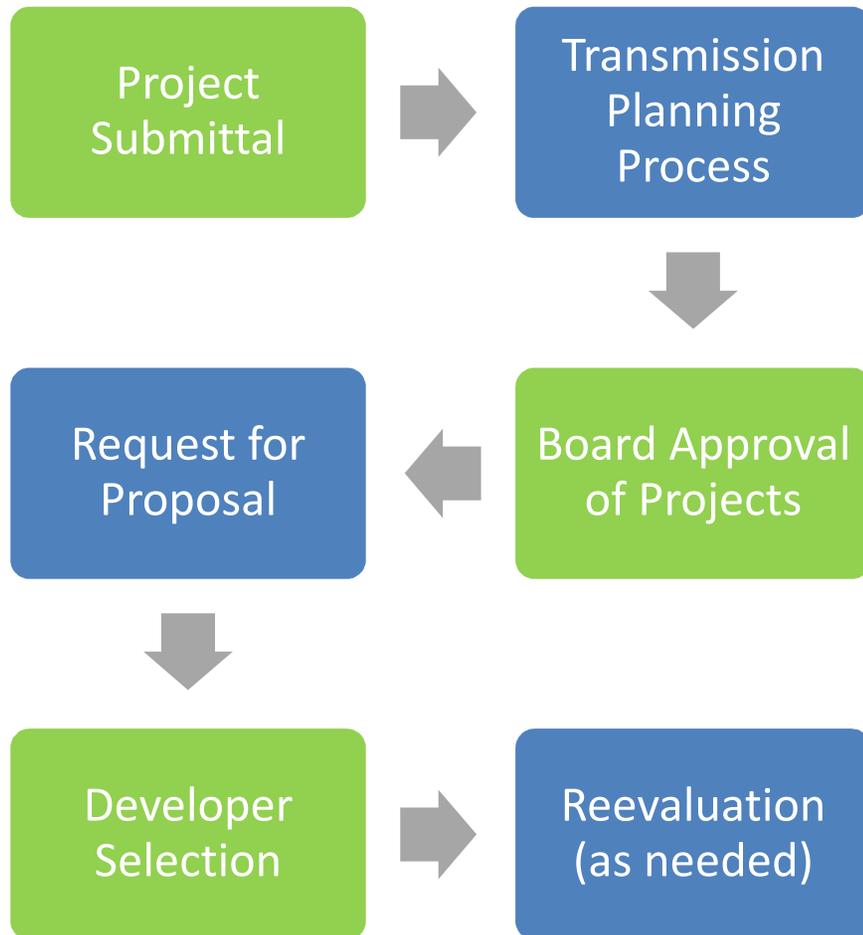
MISO's Four Neighboring Planning Regions



Coordination Agreements go beyond minimum requirements of Order 1000

	Required in Order 1000	Included in Coordination Agreements
Interconnection-Wide Planning	Does not specify a particular set of analyses that must be performed; Allows for regional differences	No, agreements focus on coordination processes between each neighboring planning region
Interregional Planning	No requirement to produce an interregional transmission plan No obligation to construct/build without regional approval	Agreement with SPP and PJM include a defined interregional planning process
Projects Other than Tie-Lines	No, Order 1000 does not require interregional coordination or cost allocation for transmission facilities other than tie-lines	Agreement with SPP and PJM include consideration of non tie-lines as interregional projects
Interregional Stakeholder Process	No, stakeholder review through regional planning process sufficient for consideration of interregional facilities	Agreement with SPP and PJM include a defined interregional stakeholder process
Public Policy	No requirement to development an interregional plan to address public policy requirements No distinct public policy cost allocation category	Interregional studies can be performed to address any transmission issue (including public policy)

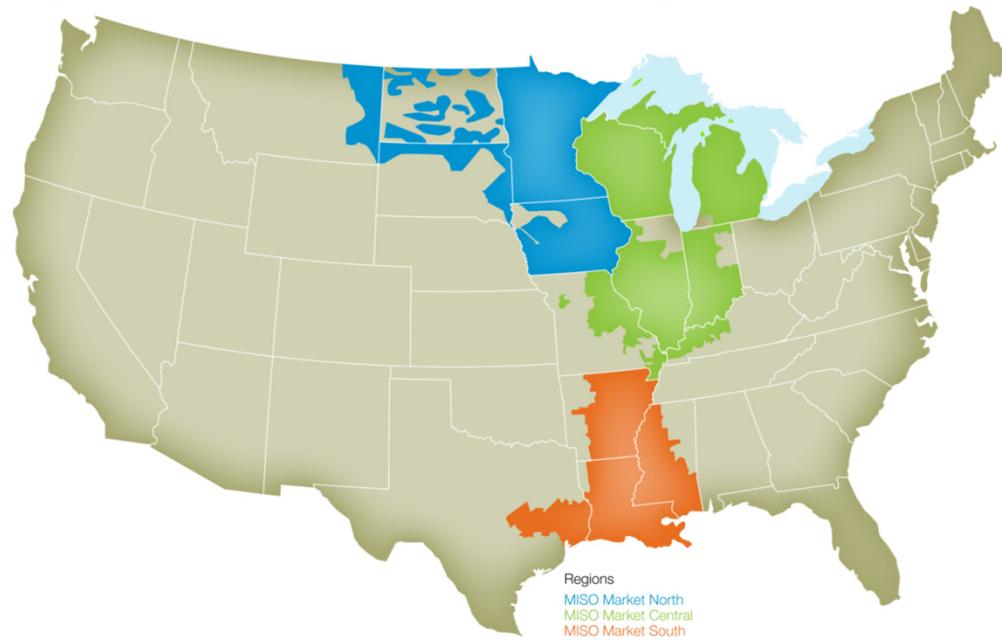
Elimination of Right of First Refusal: Key Regional Components



- Inclusive evaluation approach will be used, where qualified developers submit proposals to construct, own, operate, and maintain applicable facilities
- Evaluation will consider at least the following components:
 - Project design and life cycle cost
 - Developer implementation (i.e. construction) abilities and strengths
 - Developer operation and maintenance abilities and strengths
 - Planning process participation and analyses conducted
- Will apply to project Market Efficiency and Multi Value Projects

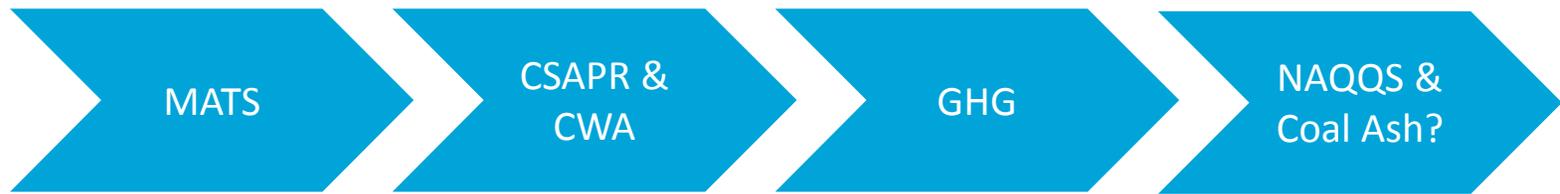
MISO South Region Integration

Post-Integration MISO Footprint



	Current Footprint	MISO South	After Integration	Increase
Transmission Owners	36	10	46	28%
Transmission Lines (miles)	50,000	16,000	66,000	32%
Local Balancing Authorities	28	6	34	21%
Market Participants	359	32	391	9%
Generation (megawatts)	132,000	50,000	182,000	38%
Load (megawatts)	98,000	30,000	128,000	31%

The generation fleet in MISO is being affected by timing, fuel prices and multiple environmental regulations.



Nature of Regulation	Mercury and Air Toxics Standards	Cross State Air Pollution Rule and Water Regulations (316(b))	Carbon Regulations (Clean Power Plan)	National Ambient Air Quality Standards? Coal Ash?, Others?
Compliance Dates	2015 / 2016	As early as 2015	2020-2029, 2030 and beyond	???
Impacts	<ul style="list-style-type: none"> • Significant coal retirements • Outage coordination challenges • Shrinking reserve margins around MISO • Growing dependence on natural gas 	<ul style="list-style-type: none"> • CSAPR is subject to ongoing litigation • EPA sought lift of stay on CSAPR – could make rule effective as early as 2015 • Final water intake rule released May 2014 	<ul style="list-style-type: none"> • Draft Rule released June 2014 • Continued pressures on reserve margins • Increased dependence on natural gas • Regulatory uncertainty 	

These factors will culminate in the erosion of reserve margins and an increase in reliability risk.

Questions?

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Fresh Energy

The Changing Electricity System: Challenges and Opportunities

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Fresh Energy Our Core Goals



Fresh Energy

Healthy economy
Healthy people
Healthy environment
Energy independence

Fresh Energy promotes public policy to create an energy system that sustains our economy, our people, and our planet.



Overview

- Market trends facing electricity industry are changing electricity system
- Optionality and flexibility will be key components to electricity infrastructure
- Multiple benefits to robust regional grid
 - MISO Multi-Value Projects
- Looking forward - challenges
- Questions, discussion

Changing utility environment – changing grid

Generation

- Aging coal fleet in Midwest
- Low natural gas prices
- Increasingly competitive renewable energy – more modular generation option in face of uncertain load growth



Demand/Customer side

- Load growth slowing
 - Recession
 - Energy efficiency
 - Distributed generation, esp. solar



Renewable Energy in MISO

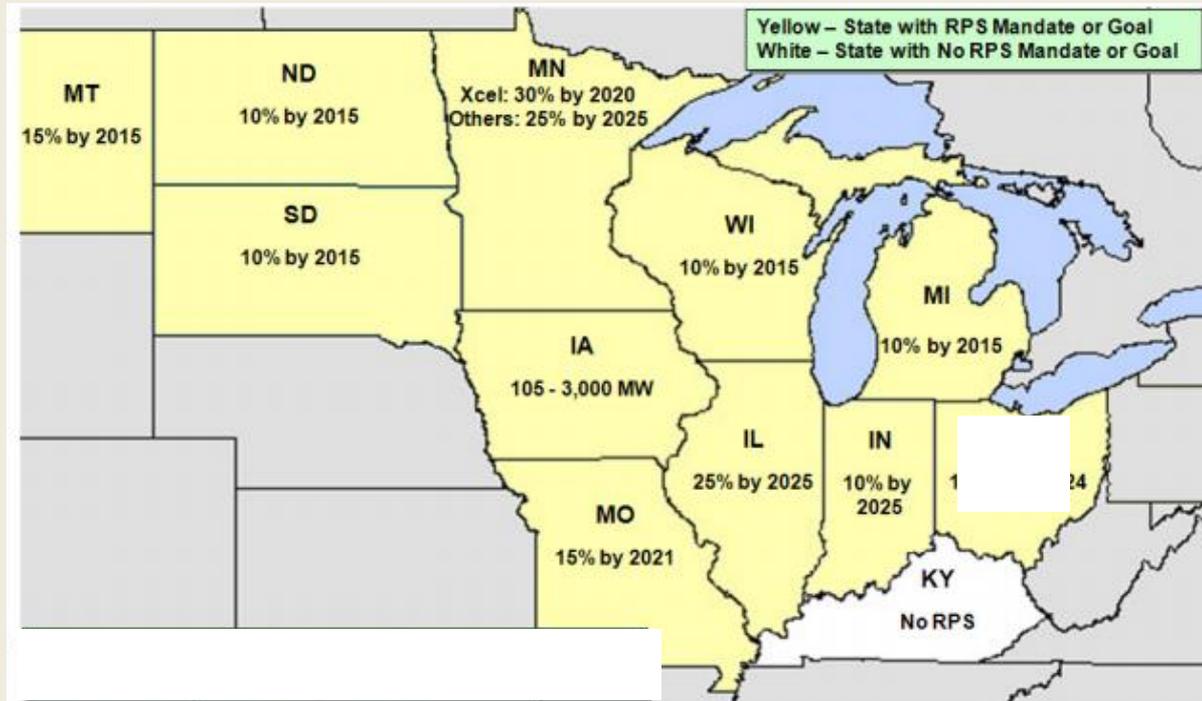
2005: 1,000 MW installed wind

MTEP 2014 Draft:

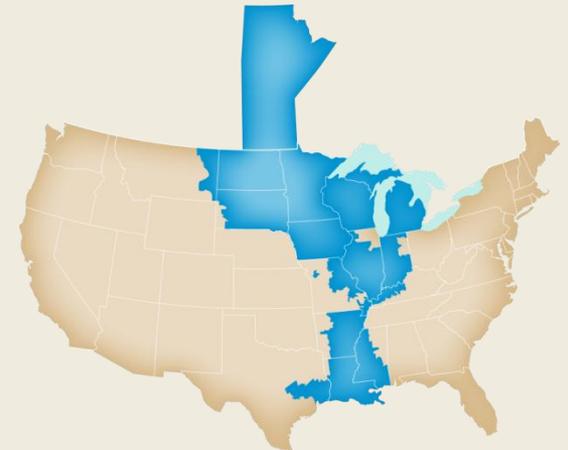
- 15,215 MW active projects in the interconnection queue
- 12,464 MW wind in service
- 13,035 MW registered wind capacity (January 2014)
- **810 MW of new solar requests in 2014**



POLICY: MISO State Renewable Electricity Standards

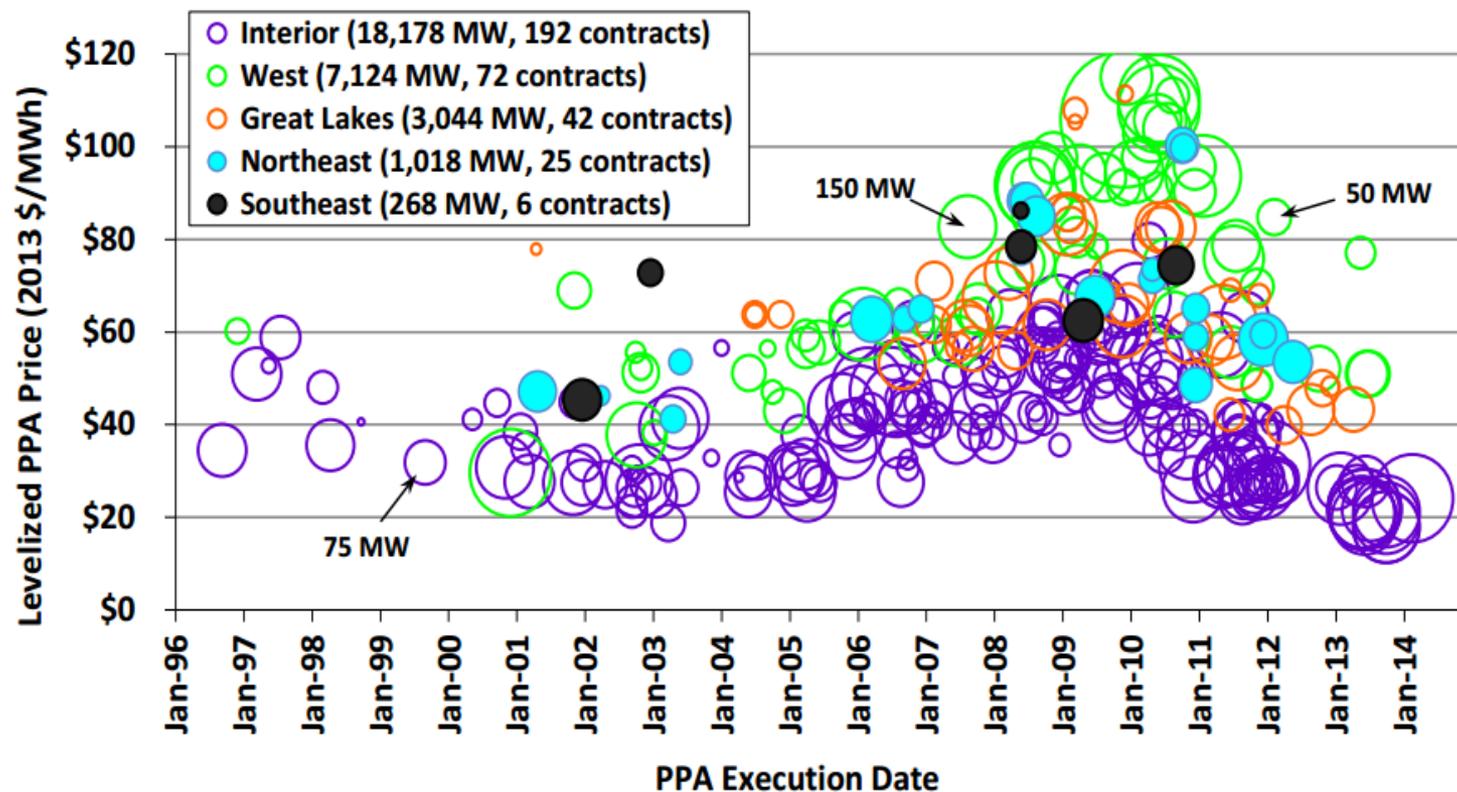


+ Texas standard:
5,880MW by 2015



ECONOMICS: Wind prices continue to drop - passing savings onto consumers

Wind PPA Prices Have Reached All-Time Lows



From presentation by Ryan Wiser, LBNL, "Overview of the 2013 Wind Technologies Market Report," Aug. 2014.

http://apps2.eere.energy.gov/wind/windexchange/pdfs/workshops/2014/webinar_doe_wind_market_reports-ryan-wiser.pdf

2013: Xcel Energy procures 750MW wind – ahead of law

“Wind power is simply the cheapest resource available right now, and we are taking the opportunity... to further shape our systems for the future...”

*[The proposals we have gotten from developers] resulted in some prices for additional wind power that... **can provide some actual reduction in the cost of electricity for our customers.**”*

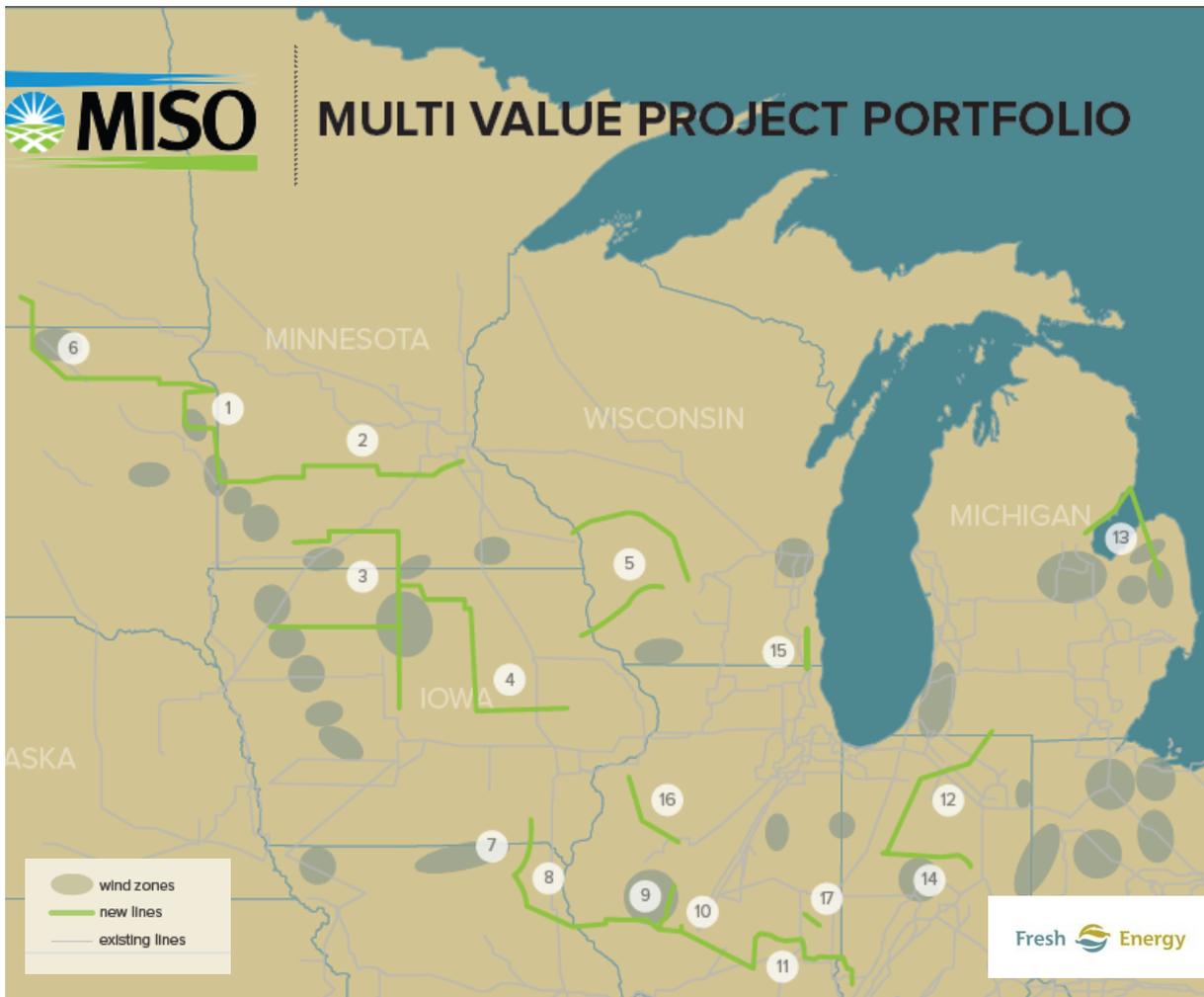
– Ben Fowke, Xcel CEO

StarTribune July 16, 2013, “Xcel to boost its wind in Upper Midwest by 33 percent”





MULTI VALUE PROJECT PORTFOLIO



Project Name	State	Voltage
1. Big Stone - Brookings	SD	345 kV
2. Brookings - South East Twin Cities	SD/MN	345 kV
3. Lakefield Junction - Winnebago - Winco - Burt area and Sheldon - Burt area - Webster	MN/IA	345 kV
4. Winco - Lime Creek - Emery - Blackhawk - Hazleton	IA	345 kV
5. North LaCrosse - North Madison - Cardinal and Dubuque County - Spring Green - Cardinal	WI	345 kV
6. Ellendale - Big Stone	ND/SD	345 kV
7. Adair - Ottumwa	IA/MO	345 kV
8. West Adair - Palmyra Tap	MO	345 kV
9. Palmyra - Quincy - Meredosia - Ipava and Meredosia - Pawnee	MO/IL	345 kV
10. New Pawnee - Pana	IL	345 kV
11. Pana - Mount Zion - Kansas - Sugar Creek	IL	345 kV
12. Reynolds - Burr Oak -Hiple	IN	345 kV
13. Michigan Thumb Loop Expansion	MI	345 kV
14. New Reynolds - Greentown	IN	765 kV
15. Pleasant Prairie - Zion Energy Center	WI/IL	345 kV
16. Fargo - Oak Grove	IL	345 kV
17. Sidney - Rising	IL	345 kV

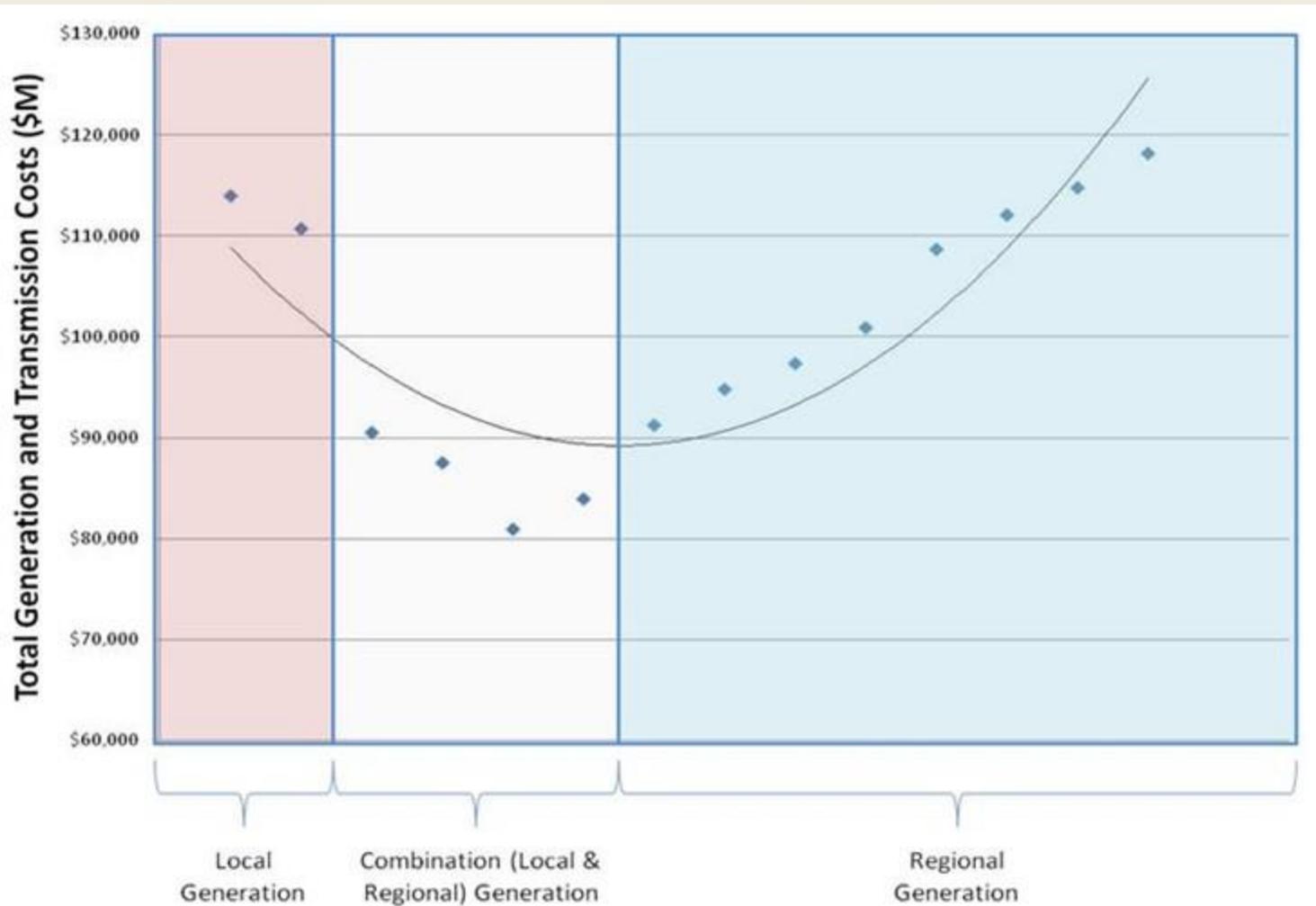
MISO Multi-Value Projects

“No regrets” package - Preserve optionality in future regional grid improvements

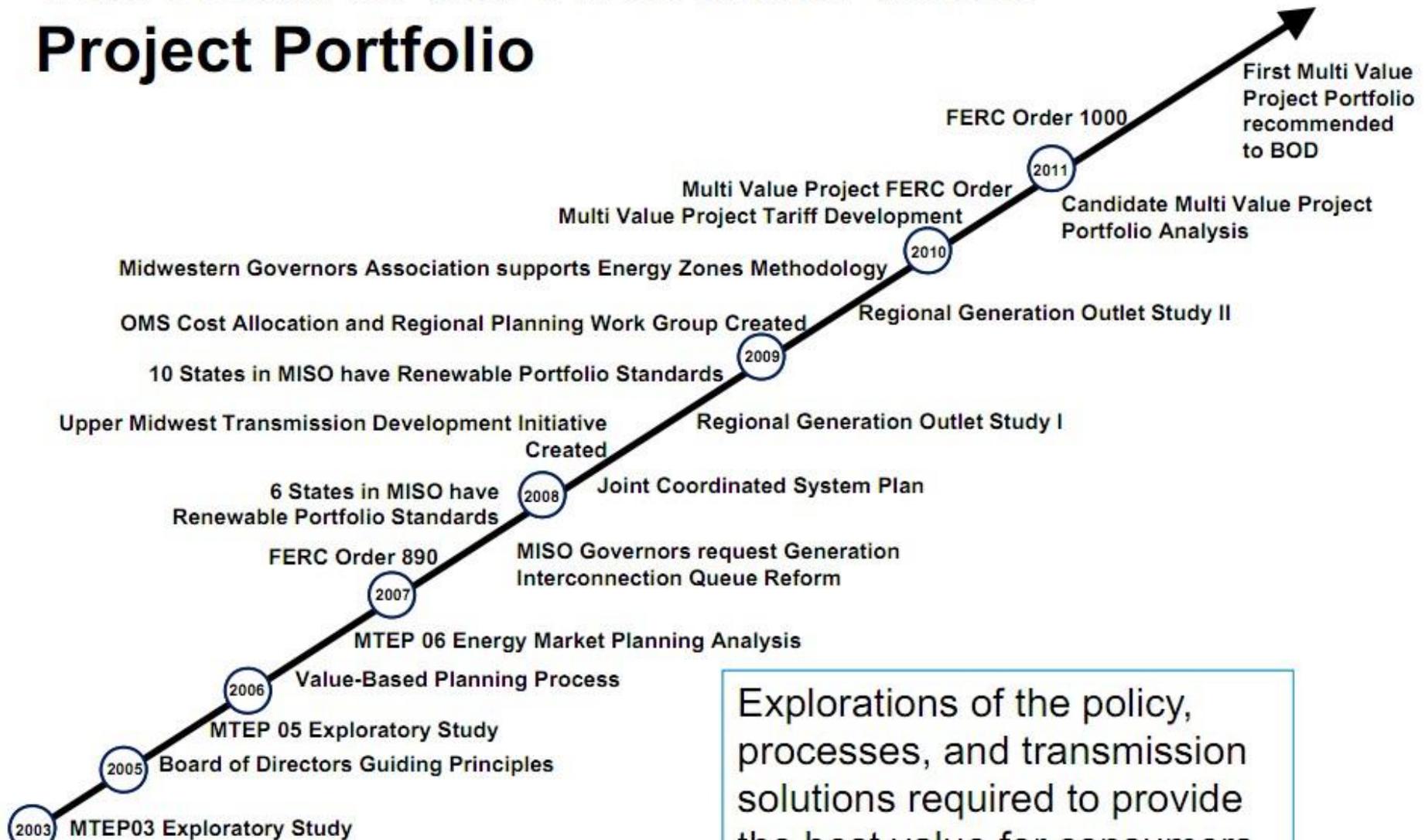
Criteria

- 1) Reliably and economically enable regional public policy needs**
- 2) Provide multiple types of regional economic value**
- 3) Provide a combination of regional reliability and economic value**

MVPs: Meet state RESs at least cost



The Road to the First Multi Value Project Portfolio



Explorations of the policy, processes, and transmission solutions required to provide the best value for consumers began in 2003



(A Few) Future Challenges

- Electricity system is changing. Opportunity to construct **a more flexible system** able to use many kinds of resources.
- MISO MVPs for existing state RESs. What about states increasing their RES?
- Transmission **lead time** is an issue.
- Distributed generation, especially solar?
- Demand response, storage, etc.

Minnesota Renewable Energy Integration and Transmission Study

Objectives:

1. Evaluate the impacts on reliability and costs associated with increasing renewable energy to 40% of Minnesota retail electric energy sales by 2030, and to higher proportions thereafter;
2. Develop a conceptual plan for transmission necessary for generation interconnection and delivery and for access to regional geographic diversity and regional supply and demand side flexibility;
3. Identify and develop options to manage the impacts of the variable renewable energy resources;
4. Build upon prior renewable energy integration studies and related technical work;
5. Coordinate with recent and current regional power system study work;
6. Produce meaningful, broadly supported results through a technically rigorous, inclusive study process.

Thank you!



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Regional approaches to 111(d) compliance

Will Kaul

Vice president, Great River Energy

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GRE market-based carbon compliance proposal

- Add a carbon price to the dispatch algorithm sufficient to achieve carbon compliance
 - Not a social cost of carbon
- Carbon revenue collected by market operator is redistributed to load based on energy sales
 - Not a tax
- Carbon content of fuel is the only new wrinkle in the marketplace

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Summary of EPA 111(d) Guidelines

- Dubbed EPA’s “Clean Power Plan”
- Sets minimum stringency for a state—called “state goals” that apply in aggregate to the state’s “affected” electric generating units
- Establishes a compliance time period of ten years, with an interim target to apply on average between 2020 and 2029, and a final target in 2030
- Guidelines give states very broad flexibility to achieve state goals through any “efficacious means”

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Building blocks

Heat Rate Improvements at Coal Plants
6% through both O&M and plant upgrades

Increased Utilization of Existing Natural Gas Plants
Dial up existing NGCC to 70% capacity factor

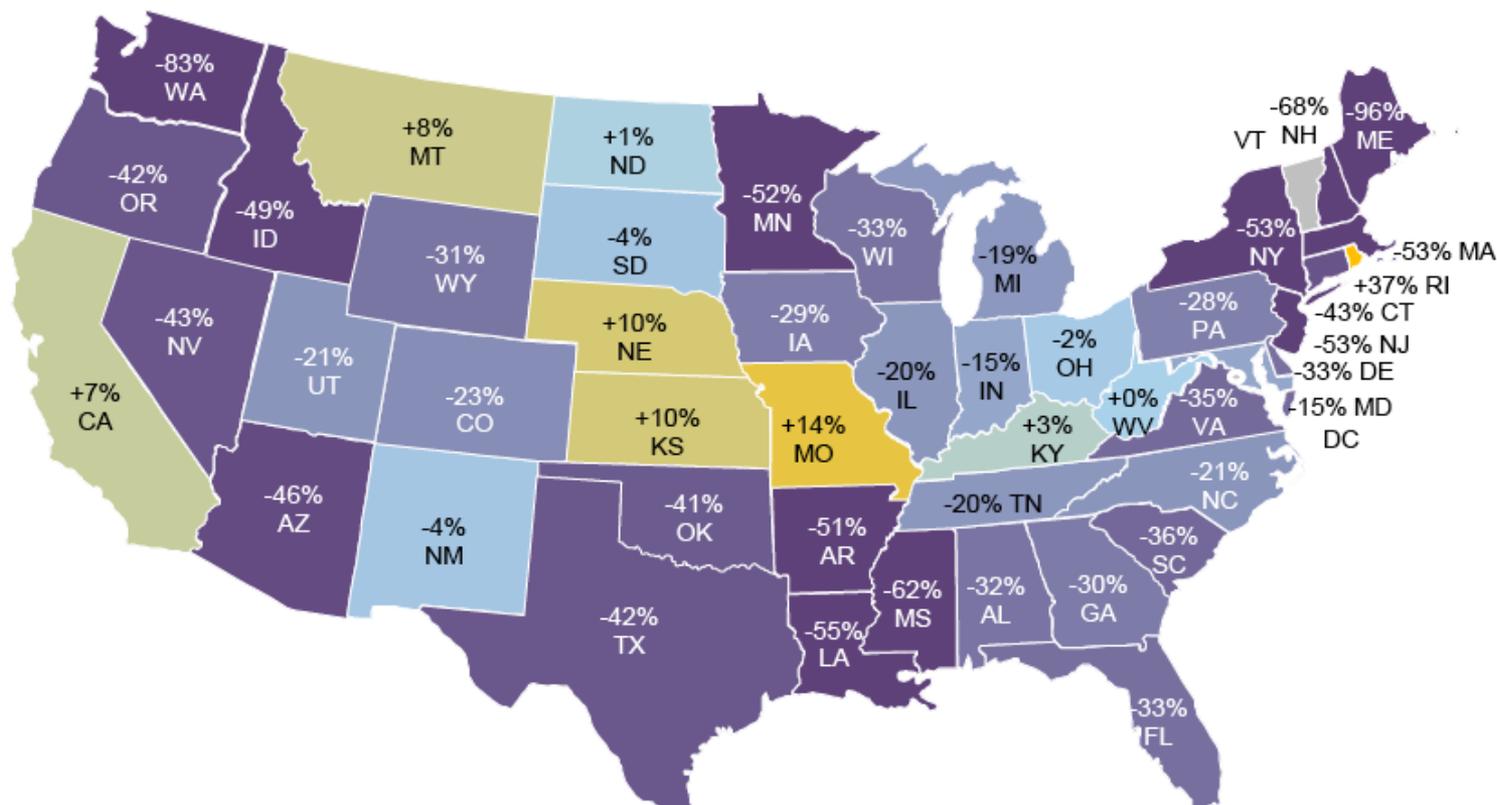
Increased Utilization of Zero Carbon Resources,
Including Nuclear and Renewables
Operate New Nuclear Plants, Preserve the 6% of Existing
Nuclear capacity that EIA projects would retire; & Achieve
renewables generation consistent with average regional
renewables target

Achieve 1.5% Energy Savings
through End-Use Energy Efficiency
Starting where a state is, increase energy savings at a rate of
0.2% per year until state reaches 1.5%



State Goals as % Reduction from 2012

Percentage-based cuts – 2030 reductions versus 2012 levels



Source: Bloomberg New Energy Finance

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Some questions

- Is a carbon price central dispatch approach still feasible?
- Emission credits trading, or other market mechanisms?
 - Which agencies have jurisdiction?
 - Validation of credits
 - How does the money flow? Who are the counterparties to the transaction?
 - Is there even time?

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Questions?

Thank you for joining us.

- Please visit our site at www.cleanenergytransmission.org
- Follow us on Twitter [@clean_energy_grid](https://twitter.com/clean_energy_grid)
- Join us for future webinars and events, and feel to reach out to us for any transmission-related questions.



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