



414 Nicollet Mall  
Minneapolis, MN 55401



215 South Cascade Street  
PO Box 496  
Fergus Falls, MN 56538-0496

June 24, 2011

Darrell Nitschke, Executive Director  
North Dakota Public Service Commission  
State Capitol Building, Dept. 408  
600 East Boulevard  
Bismarck, ND 59505-0480

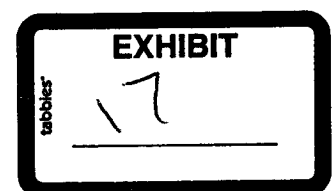
**Re: Otter Tail Power Company  
Advance Determination of Prudence -  
CapX2020 Group 1 Application  
Case No. PU-09-676**

**Northern States Power Company  
Advance Determination of Prudence -  
CapX2020 Group 1 Application  
Case No. PU-09-678**

Dear Mr. Nitschke:

Northern States Power Company, a Minnesota corporation (“Xcel Energy”), and Otter Tail Power Company (“Otter Tail” and collectively with Xcel Energy, “Applicants”) obtained an Advanced Determination of Prudence (“ADP”) for the four CapX2020 transmission lines in this case. The ADP as it pertains to one of those lines, the Brookings – SE Twin Cities 345 kV Project (the “Brookings Project” or “Project”), was the subject of certain conditions, including the requirement of the Applicants to 1) update the North Dakota Public Service Commission (“Commission”) on the cost allocation methodology proposed to be applicable to the Brookings Project and 2) demonstrate continued prudence of that Project.

Applicants are pleased to provide this update to the Commission regarding the Midwest Independent Transmission System Operator, Inc.’s (“Midwest ISO”) recent action of officially recognizing that the Brookings Project satisfies all of the requirements and prerequisites of a Multi Value Project (“MVP”) pursuant to Attachment FF of the Midwest ISO Tariff. This recognition is an important step forward for the Brookings Project as it provides greater certainty that the costs of this



Darrell Nitschke, Executive Director

June 24, 2011

Page 2

important project will be spread among all users of the Midwest ISO System pursuant to the MVP tariff provisions. This recent decision also provides Applicants with an opportunity to provide the Commission with an update on the status and schedule of the Brookings Project and our continued prudence in moving forward.

#### Cost Allocation Update

On June 8, 2011, the Staff of the Midwest ISO recommended that several transmission projects, including the Brookings Project, be approved for inclusion in Appendix A of the Midwest Transmission Expansion Plan (“MTEP”). The materials presenting this recommendation to the Midwest ISO Board are enclosed with this letter. Midwest ISO Staff recommended that the Brookings Project be conditionally approved under the MVP provisions.<sup>1</sup> Since the Federal Energy Regulatory Commission (“FERC”) required that MVPs be reviewed on a portfolio basis,<sup>2</sup> Staff suggested that the Brookings Project MVP classification be conditioned on finalizing the remainder of the Candidate MVP portfolio, of which the Brookings Project is a part,<sup>3</sup> later this year. In other words, Midwest ISO Staff recommended that the Brookings Project be designated as an MVP, but that the corresponding cost treatment not commence until the MVP portfolio is finalized.

On June 16, 2011, the Midwest ISO Board of Directors accepted its Staff’s recommendation and conditionally approved the Brookings Project as an MVP, subject to the Midwest ISO Board of Director’s accepting the final 2011 Candidate

---

<sup>1</sup> Midwest Independent Transmission System Operator, Inc., MTEP JUNE 2011 REPORT, PROJECT DOCUMENTATION AND APPROVAL RECOMMENDATIONS, p. 1 (June 8, 2011) (the “June 2011 MTEP Report”) (enclosed).

<sup>2</sup> The Midwest ISO is required to review MVPs “holistically on a ‘portfolio’ basis, taking into account the synergistic effects of individual qualifying MVPS, and approving the set of MVPs that collectively comprise an optimized regional solution.” *Midwest Independent Transmission System Operator, Inc.*, 133 FERC ¶ 61,221 at P 221 (2010) (internal quotations and citations omitted).

<sup>3</sup> The Midwest ISO is currently analyzing a portfolio of 17 transmission projects throughout the Midwest ISO footprint for possible designation as MVPs, including the Big Stone – Brookings and Ellendale – Big Stone transmission projects. The 2011 Candidate MVP Study Report will provide the outcome of that analysis.

Darrell Nitschke, Executive Director

June 24, 2011

Page 3

MVP Study Report, expected in December of 2011. The Midwest ISO describes the conditional approval as follows:

Conditional approval means that the Brookings project fully meets tariff criteria to be designated as an MVP and it will be afforded the appropriate cost treatment upon Board acceptance of the final 2011 Candidate MVP Study Report.<sup>4</sup>

The timing of this approval is an important step for Applicants and is designed to accommodate the Brookings Project's anticipated 2015 in-service date.<sup>5</sup> To meet this in-service date, certain pre-construction activities must be commenced this fall. The conditional approval provides sufficient cost treatment certainty to move the Project forward on its current schedule.

Applicants believe that the Midwest ISO's actions provide greater certainty as to the cost allocation methodology applicable to the Brookings Project; namely, that the Brookings Project will be afforded MVP cost treatment. The Midwest ISO's actions confirm that the Brookings Project meets the MVP criteria and that it will be treated as such, subject to the portfolio requirements ordered by the Federal Energy Regulatory Commission ("FERC"). Consequently, and consistent with the Commission's October 6, 2010 Order Adopting Settlement ("October 6 Order") in

---

<sup>4</sup> Midwest Independent Transmission System Operator, Inc., MTEP June 2011, Projects Recommended for Approval, June 8, 2011 (enclosed). The remainder of the Candidate MVP Portfolio is expected to be recommended for approval at the November or December 2011 Midwest ISO Board of Directors meeting after the completion of the business cases for the remaining projects in the portfolio. Midwest Independent Transmission System Operator, Inc., MTEP JUNE 2011 REPORT, PROJECT DOCUMENTATION AND APPROVAL RECOMMENDATIONS, p. 1 (June 8, 2011) (enclosed).

<sup>5</sup> In the June 2011 MTEP Report, at p. 5 (enclosed), Midwest ISO Staff explained: "[T]he Brookings Project requires conditional approval prior to the remainder of the portfolio based on regulatory risk, potential cost penalties, and construction timelines. . . . [The regulatory approvals for the Brookings Project] are premised upon a 2015 in-service date, and right-of-way acquisition must start in the fall of 2011 to enable this in-service date. Similarly, a delayed project approval could drive an additional \$15 million in project costs, due to material supply and construction schedule modifications. Finally, the business case for the Brookings Project has been completed, and the project has been fully justified."

Darrell Nitschke, Executive Director

June 24, 2011

Page 4

this proceeding, the Midwest ISO's June 16, 2011 actions resolve the cost allocation issues relevant to the Brookings Project.

*Status and Next Steps for Brookings Project*

The Brookings Project remains an important system element that is needed to provide an important link in the system's ability to transmit energy from the wind-rich areas in North Dakota and South Dakota to load centers in the east. Interest in wind generation remains strong and the Brookings Project remains one of the foundational facilities that is assumed in applicable transmission studies to accommodate additional wind generation. As such, the Brookings Project remains a prudent project for Applicants to complete.

To that end, Applicants are pleased to report that all Critical Permits for the Brookings Project have been received. On March 1, 2011, the Minnesota Public Utilities Commission issued a route permit for the fifth, and final, segment of the Brookings Project within Minnesota.<sup>6</sup> Additionally, the South Dakota Public Utilities Commission has issued a Facility Permit for the South Dakota portion of the Brookings Project on June 14, 2011.<sup>7</sup> With these actions, the utilities participating in the Brookings Project ("Participating Utilities") have received all the major regulatory approvals necessary to construct the Brookings Project.

In ordering clause five of the October 6 Order, the Commission required that Applicants obtain a separate finding of continued prudence prior to entering into the Ownership Agreements or prior to commencing significant construction or procurement activities for the Brookings Project. We believe that the cost allocation

---

<sup>6</sup> *In the Matter of the Route Permit Application for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota*, Order Granting Route Permit for Remanded Segment of Route, MPUC Docket No. ET-2/TL-08-1474 (March 1, 2011). The other four segments of the Brookings Project within Minnesota were approved on September 14, 2010. *In the Matter of the Route Permit Application for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota*, Order Granting Route Permit, MPUC Docket No. ET-2/TL-08-1474 (September 14, 2010).

<sup>7</sup> *In the Matter of the Application of Great River Energy and Northern States Power Company d/b/a Xcel Energy for a Permit to Construct a 10.6 Mile, 345 kV Transmission Line (CapX2020) in Brookings County Near White, South Dakota*, Order Granting Joint Motion for Approval of Settlement Stipulation and Granting Permit to Construct Facilities, SDPUC Docket No. EL10-016 (June 17, 2011).

Darrell Nitschke, Executive Director

June 24, 2011

Page 5

issues applicable to the Brookings Project have been sufficiently resolved for the project to move forward. Likewise, it is clear that the Brookings Project remains a prudent system element. We therefore respectfully request that the Commission make the requisite finding to allow us to promptly move forward with procurement and construction in order to maintain the currently-contemplated 2015 completion schedule.

Applicants note that as part of our Settlement Agreement with the Commission's Advocacy Staff that was approved by the October 6 Order, we agreed to a waiver of ADP cost recovery certainty. Specifically, Applicants agreed to waive the ADP's cost recovery certainty until such time as we entered into the Ownership Agreements for the Brookings Project. This commitment will continue to be in place for the time being, as Applicants do not intend to enter into the Ownership Agreements until shortly after the December 2011 Midwest ISO Board of Directors meeting at which we anticipate the remainder of the Candidate MVP portfolio will be accepted.

Thus, we respectfully request that the Commission make a finding of continued prudence at this time. We believe it is important to obtain the Commission's continued finding that the Brookings Project remains prudent in a time frame that will allow us to enter into the Ownership Agreements at a time that will enable us to keep the Project on schedule.

During the remainder of 2011, the Participating Utilities will need to continue with preconstruction activities necessary to keep the Project on schedule. These activities are expected to include limited right-of-way acquisition, detailed engineering activities, site preparation and preliminary sourcing work for long lead time material. We expect such pre-construction activities will be performed in compliance with the terms of the October 6 Order and the Settlement Agreement approved by the Commission. Applicants will provide updates to the Commission on the status of these activities.

Applicants look forward to a resolution of this matter, which permits the Brookings Project to remain on schedule. Please feel free to contact Mr. Dave Sederquist at (701) 241-8632 or Mr. Dean Pawlowski at (218) 739-8947 with any additional questions.

Darrell Nitschke, Executive Director  
June 24, 2011  
Page 6

Respectfully,

/s/ James R. Alders  
James R. Alders  
Director of Regulatory Administration  
Xcel Energy Services Inc. on behalf of  
Northern States Power Company

/s/ Dean Pawlowski  
Dean Pawlowski  
Principal Engineer  
Otter Tail Power Company

Enclosures

cc: Keith Beal



June 8, 2011

To: MISO Board of Directors  
From: Clair Moeller, Vice President Transmission Asset Management

Subject: MTEP11 June Approval Request

2011 marks the introduction of the biannual approval cycle for transmission projects to be included in Appendix A of the MISO Transmission Expansion Plan. The additional approval was added to ensure that projects are approved on a timely basis to capture the benefits indicated by the project justification.

For the June 2011 MTEP approval, we request your consideration of three projects:

- **Straits Power Flow Control Project**  
The Straits project would install a back to back Voltage Source Converter (VSC) power flow controller at the Straits 128 kV substation between the Upper and Lower Peninsula of Michigan. The project is designed to replace a temporary operating guide that requires the 69 kV circuits in the eastern upper peninsula of Michigan to be opened for off-peak, high transfer situations. It is projected to be in-service August 1, 2014, at a cost of \$90 million. It is a Baseline Reliability Project (BRP) eligible for cost sharing.
- **Eaton Rapids Load Interconnection project**  
The Eaton Rapids project is an out of cycle request designed to meet an urgent need to provide networked transmission feeds to a new industrial customer – an electric foundry operation with machining and painting operations associated with new wind turbine blades in Eaton Rapids, Michigan. The project involves rebuilding several distribution lines to a higher voltage, as well as several substations, at a cost of \$28.5 million. The project has a requested in-service date of January 1, 2013. It is treated as “Other” for cost allocation purposes, meaning that it is recovered from the local pricing zone.
- **Brookings County to Twin Cities 345 kV Project**  
The Brookings Project is a 237 mile 345 kV line from Brookings County, South Dakota to the Twin Cities of Minnesota. The project was designed to deliver energy from the wind-rich areas of southwest Minnesota and southeast South Dakota to the Twin Cities of Minnesota and beyond. It is scheduled to be in-service by April 27, 2015, at a cost of approximately \$730 million. It is a Multi Value Project (MVP) eligible for cost sharing.

We recommend approval of both the Straits Power Flow Control Project and the Eaton Rapids Load Interconnection Project. The Brookings Project as a Multi Value Project must meet both an MVP criterion – in this case the delivery of energy in support of Renewable Portfolio Standards as well as be evaluated as part of a portfolio of projects that provides broad regional benefits commensurate with its costs. Brookings satisfies the first criteria, in that it is clearly needed to address numerous constraints caused by wind needed for the cumulative Renewable Portfolio Standard requirement in the MISO footprint. Furthermore, preliminary evaluation of the portfolio indicates benefits – from reductions in adjusted production cost, level of planning and operating reserves and transmission losses – in excess of costs over all futures considered. Because the analysis of the portfolio is ongoing,



we recommend conditional approval of the Brookings project, subject to completion of the analyses and business case for the complete portfolio. The business case for the complete portfolio will be reviewed with the System Planning Committee beginning with the September 2011 meeting. Conditional approval means that the Brookings project fully meets tariff criteria to be designated as an MVP and it will be afforded the appropriate cost treatment upon Board acceptance of the final 2011 Candidate MVP Study Report to be included in the MTEP11 Fall Report.

These projects, as well as the report itself, were fully vetted with stakeholders through a comprehensive review process that included Subregional Planning Meetings held in each of the three planning regions, Technical Study Task Force meetings, Technical Review Groups, Planning Subcommittee meetings, and Planning Advisory Committee meetings. Finally, on May 25<sup>th</sup> the Planning Advisory Committee recommended submission of the report to the Board of Directors for consideration.

If you have any questions prior to the June meeting of the Board of Directors, please do not hesitate to contact me.

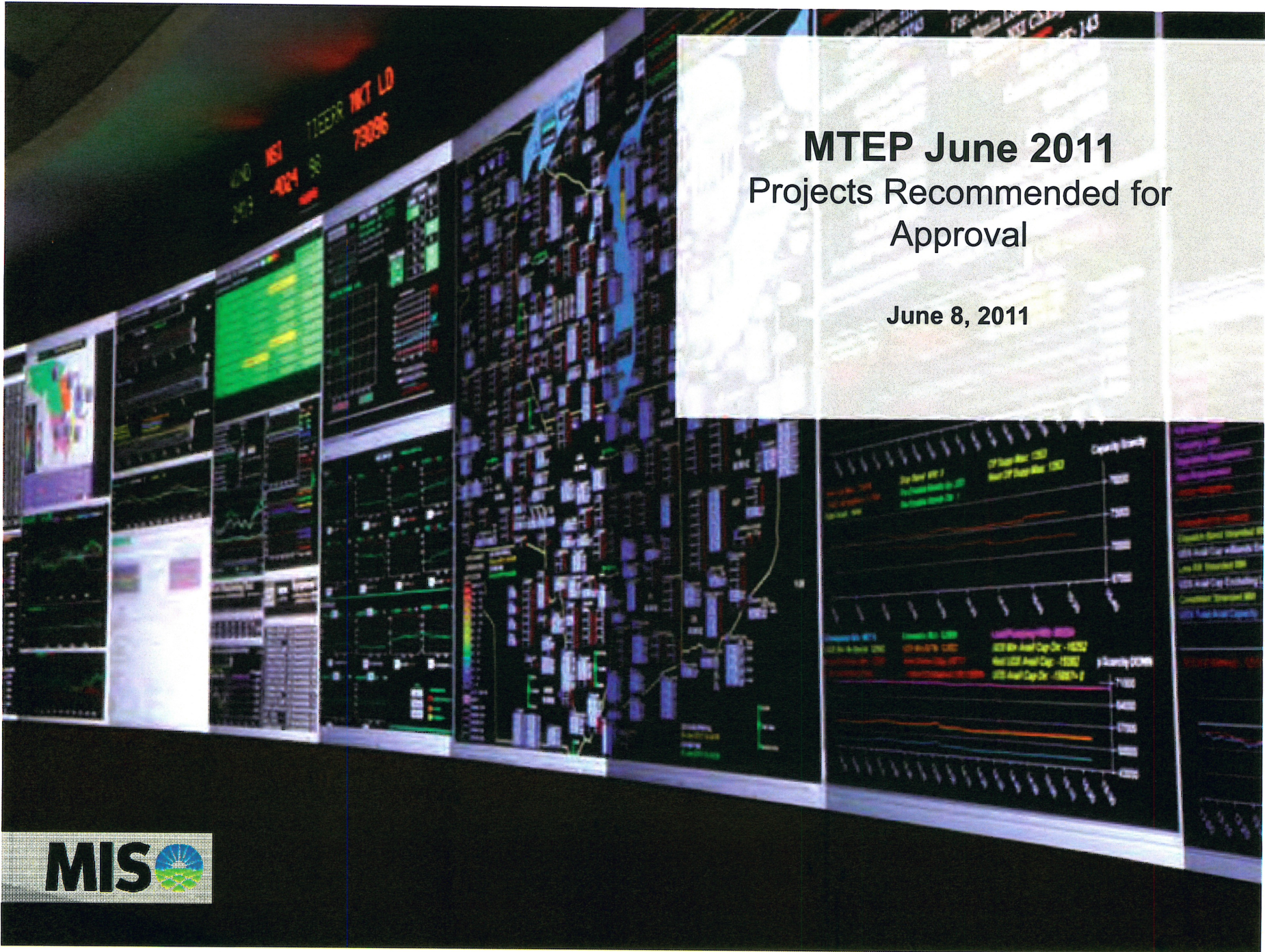
Sincerely,

A handwritten signature in black ink, appearing to read "Clair Moeller". The signature is fluid and cursive, written over a light blue horizontal line.

Clair Moeller  
Vice President Transmission Asset Management  
Midwest ISO  
651-632-8441

Enclosure

cc: Midwest ISO Executive Team



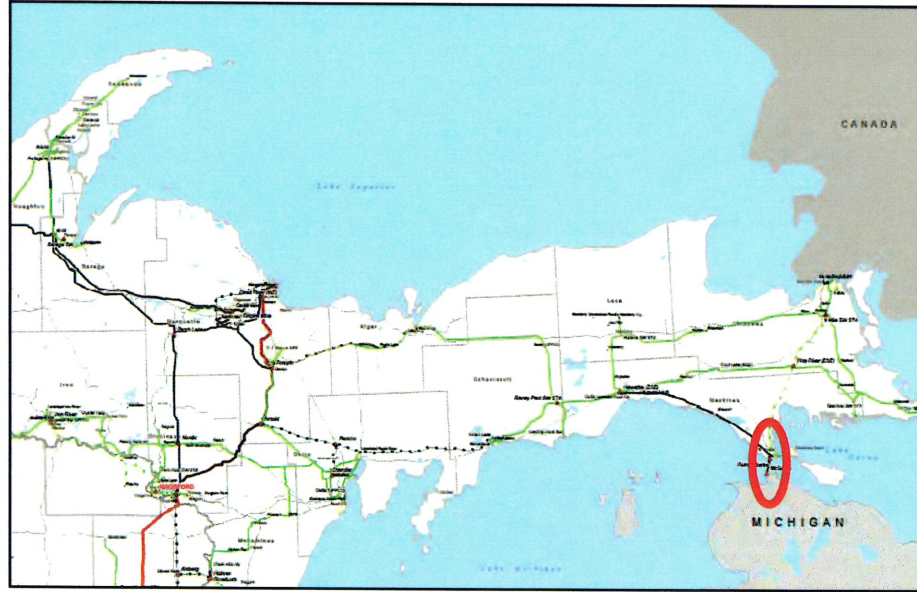
# MTEP June 2011 Projects Recommended for Approval

June 8, 2011

# MTEP June 2011 New Appendix A Investment

- Recommending three projects totaling \$848.5 million for approval by the Board of Directors in June
  - Straits Power Flow Control Project [Approval]
  - Eaton Rapids Load Interconnection [Approval]
  - Brooking County to Twin Cities 345 kV project [Conditional Approval]
- Stakeholder substantive comments on the MTEP 11 June documentation fall into general groups
  - Applicability of Cost Allocation
  - Study review time
  - MVP policy
  - Business case demonstration
  - Stakeholder Review / Process Improvements
  - Report Edits and Clarifications

# Straits Power Flow Control Project Description



- Project will install a 200 MW back-to-back High Voltage Direct Current (HVDC) link connected in series with the Straits-McGulpin 138 kV cables between the upper and lower peninsulas of Michigan
- \$90 million Baseline Reliability Project
- Project Benefits
  - Controls excessive west to east flows through the eastern Upper Peninsula (UP) of Michigan during off-peak hours resulting in overloaded facilities, low voltages, and operational issues
  - Maintains connection between Upper and Lower Peninsulas providing operating flexibility under normal and planned outage conditions

# Stakeholder Substantive Feedback

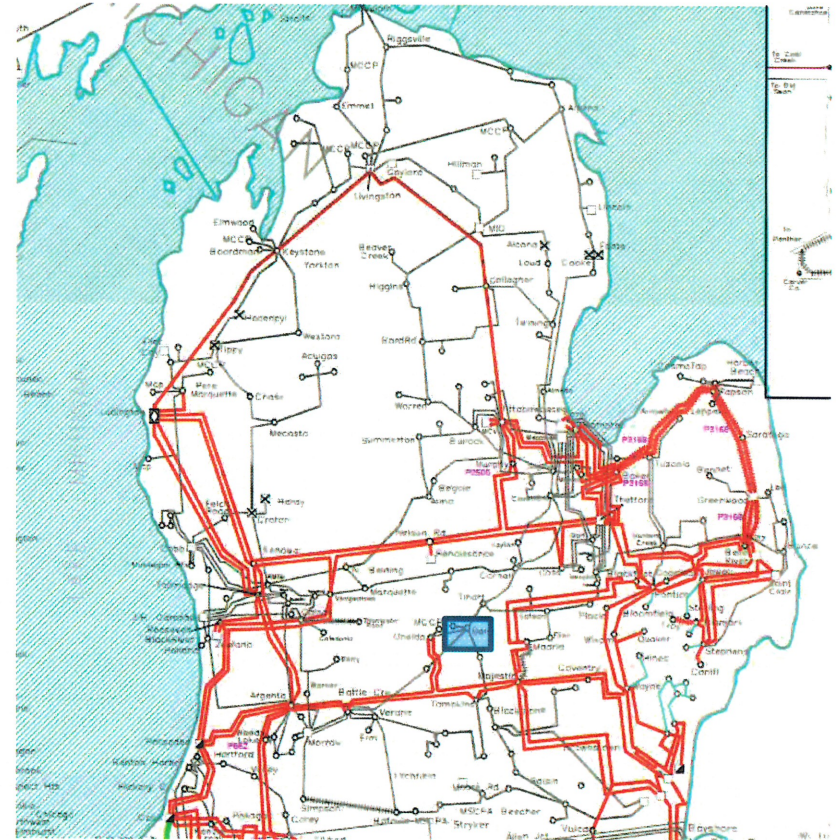
## Straits Project

- 3 stakeholders provided comments expressing reservations about the project
- 1 stakeholder provided comments in support
- Comments in opposition desired
  - More specificity on how the project will be operated, and market impacts
  - More time to review study results
    - MISO Responses
      - Straits project was first introduced to stakeholders at the MTEP10 East and West Subregional Planning meetings in June 2010
      - Justification and analytical results have been reviewed at 6 Subregional Planning Meetings and 6 Technical Study Task Force Meetings
      - The project is needed to address reliability issues. Specific day-to-day operating protocols will be developed as appropriate. A call was also held with stakeholders and MISO operations to discuss the expected real-time operation of this device.
  - Alternative cost allocation for this Baseline Reliability Project
    - MISO Response
      - The project's cost was allocated as per the tariff requirements for reliability driven projects.



# Eaton Rapids Load Interconnection Project Overview

- Provide looped 138 kV service to a new 138/12.47 kV substation in Eaton Rapids, MI to serve a new industrial customer
- The City of Eaton Rapids has requested a September 2012 in-service date for this project in order to ensure the customer's January 2013 load addition can be met.
  - Out of Cycle request received from ITC on April 13, 2011 with a requested MISO approval date on June 16, 2011
- \$28.5 million “Other (Distribution)” project

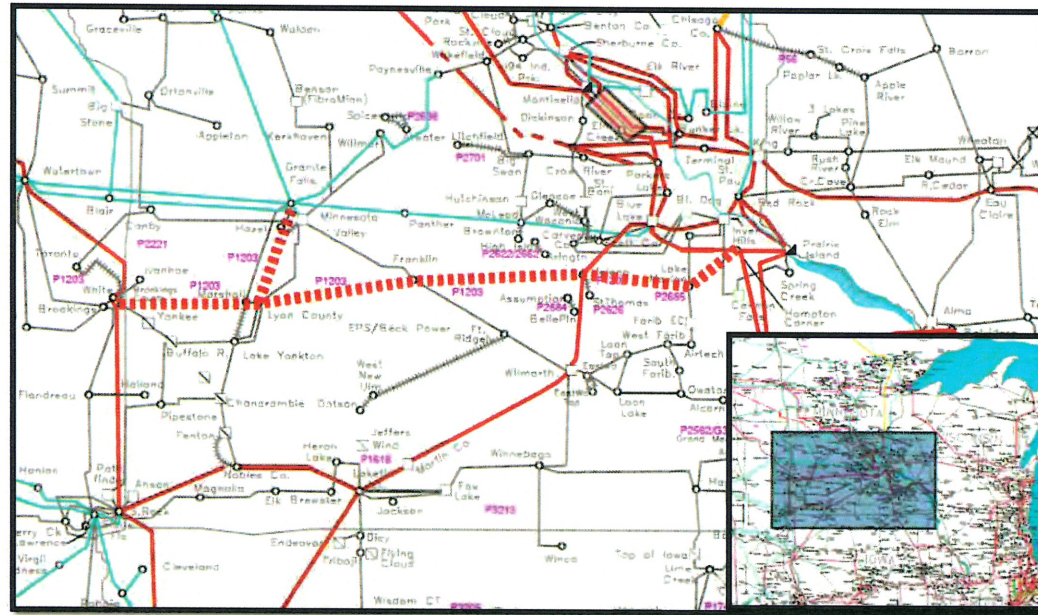


# Stakeholder Substantive Feedback

## Eaton Rapids Project

- 1 stakeholder provided comments expressing reservations about the project
- 1 stakeholder provided comments in support
- Comments in opposition desired
  - Alternative cost allocation for this Network Upgrade
    - MISO Response:
      - The project design is typical for this type of customer and system.
      - The project's cost was not directly assigned to the customer because the project is a Network Upgrade needed to provide continued efficient and reliable service to an existing Network Service Customer. This treatment is standard under the tariff.

# Brookings County – Twin Cities 345 kV Project



- 237 mile 345 kV line with ties to underlying transmission system from Brookings County, South Dakota to the Twin Cities of Minnesota
- \$730 million Multi Value Project
- Project Benefits
  - Mitigates 3,485 different transmission outages causing loadings near or above safe ratings
  - Eliminates the need to curtail the delivery of approximately 2,049 MW of connected wind
  - Part of Portfolio providing economics benefits above costs in all futures



# Brookings County – Twin Cities 345 kV Project Conditional Approval

- Seeking conditional approval of this MVP
- Requirements for MVP tariff treatment
  - Meet one or more MVP criteria
  - Be evaluated as a part of a portfolio of projects
- Brookings Meets MVP Criterion 1
  - Addresses numerous constraints caused by the Renewable Portfolio Standard mandates within MISO
  - Preliminary evaluation of the full portfolio indicates benefits in excess of costs over all futures considered
- Completion of Portfolio Evaluation
  - Recommend conditional approval of the Brookings project until analysis of the full portfolio is complete
  - Conditional approval means that the Brookings project fully meets tariff criteria to be designated as an MVP and it will be afforded the appropriate cost treatment upon Board acceptance of the final 2011 Candidate MVP Study Report

## **Stakeholder Substantive Feedback Brookings Project / Candidate MVP Portfolio Analysis**

- 3 stakeholders provided comments expressing opposition or reservations to the project
- 1 stakeholder provided comments in support of the project
- Comments in opposition stated that
  - Insufficient project benefits were demonstrated  
Benefits were not demonstrated as robust against alternative futures
    - MISO Response
      - MISO analyses showed that the project meets MVP Criterion 1 (enable energy policy), and that when evaluated as a part of a broader portfolio the portfolio provides benefits in excess of costs under all futures

## **Stakeholder Substantive Feedback (Cont.)**

### **Brookings Project / Candidate MVP Portfolio Analysis**

- (Continued) Comments in opposition stated that
  - MVP policy subsidizes generators
    - MISO Response
      - Not all stakeholders agree with the tariff MVP criterion to develop forward looking plans to ensure that energy policy objectives are achievable
  - Economic benefits for only the full portfolio were demonstrated  
Portfolio benefits were not demonstrated to be commensurate with costs
    - MISO Response
      - MISO agrees that it is important to evaluate MVP on a portfolio basis and for this reason we are requesting conditional approval until the portfolio analyses are completed.

# Stakeholder Substantive Feedback

## General MTEP Process Feedback

- In addition to the project specific comments, stakeholders also stated that additional time for the review of the models and analytical results is desirable
- MISO Response
  - MISO recognizes that the stakeholders desire for adequate review time for project review time is important. This desire is part of the rationale behind the introduction of the June approval cycle, so that studies begun in any given year may be approved in the subsequent June rather than in traditional Fall approval cycle.

# Planning Advisory Committee Motion

*“The Planning Advisory Committee (PAC) sectors have reviewed and discussed the draft MTEP11 Report that MISO will send to the Advisory Committee (AC) and the MISO Board of Directors for approval in June. The PAC sectors have provided written comments and suggestions for improvement of MISO’s planning activities to be included in future planning processes. PAC sector members are willing to present their comments at a future AC or Board meeting and to answer any questions that the AC or Board may have regarding the comments and recommendations. Although various points for improvement have been raised, the PAC believes that the MTEP11 report should proceed to the Board of Directors for approval.”*

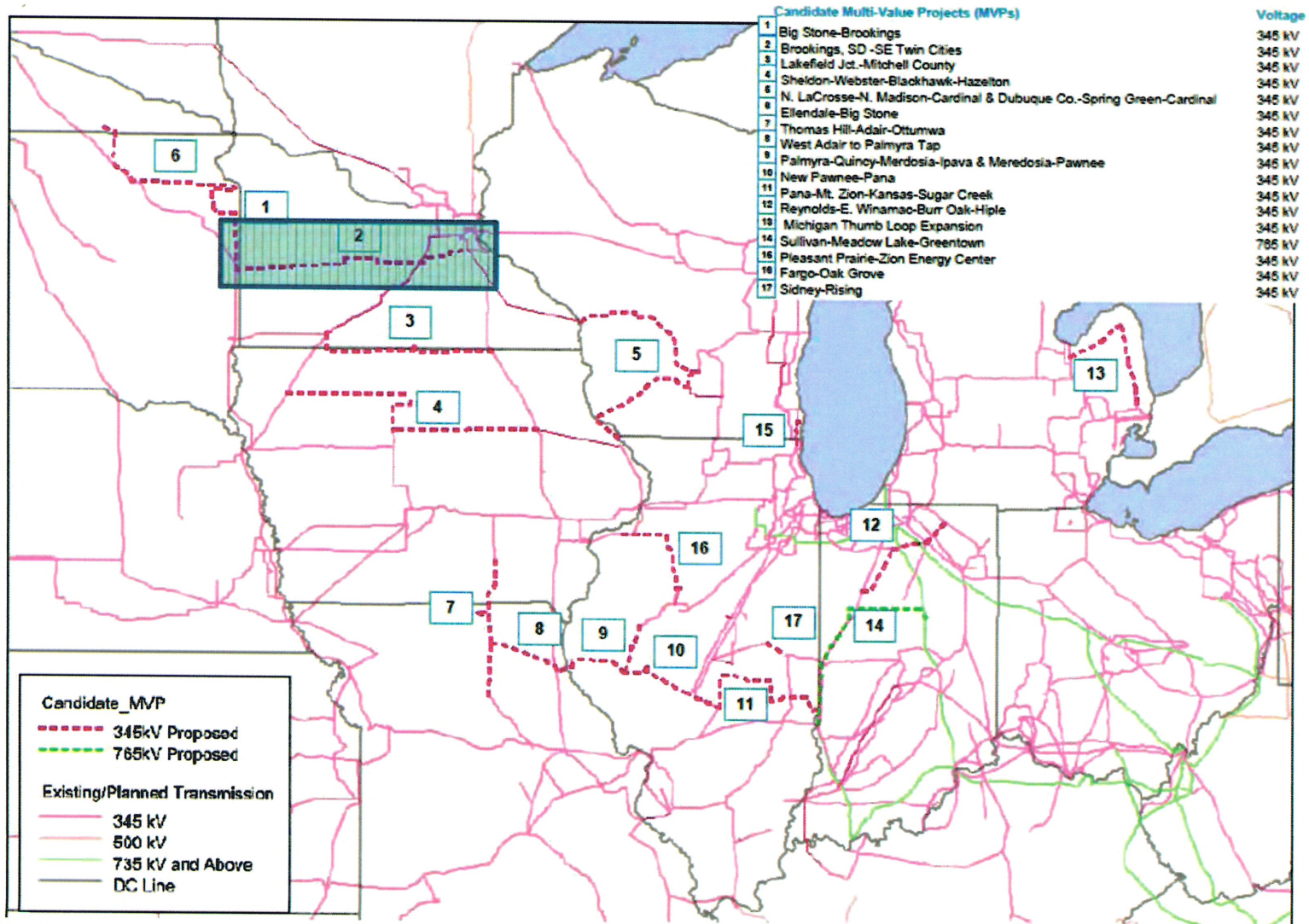
- Motion results
  - 5.8 votes for
    - Transmission Owners
    - State Regulatory Authorities
    - Independent Power Producers
    - Power Marketers and Brokers
    - 80% of Municipals, Cooperatives and Transmission Development Utilities
    - Environmental
  - 0.2 votes against
    - 20% of Municipals, Cooperatives and Transmission Development Utilities



MISO requests the consideration of the Straits Flow Control and Eaton Rapids projects for approval, and the Brookings project for conditional approval as discussed in this presentation, at the June 16, 2011 Board of Directors meeting.

# Appendix

# 2011 Candidate MVP Portfolio



Brooking County – Twin Cities Project highlighted.

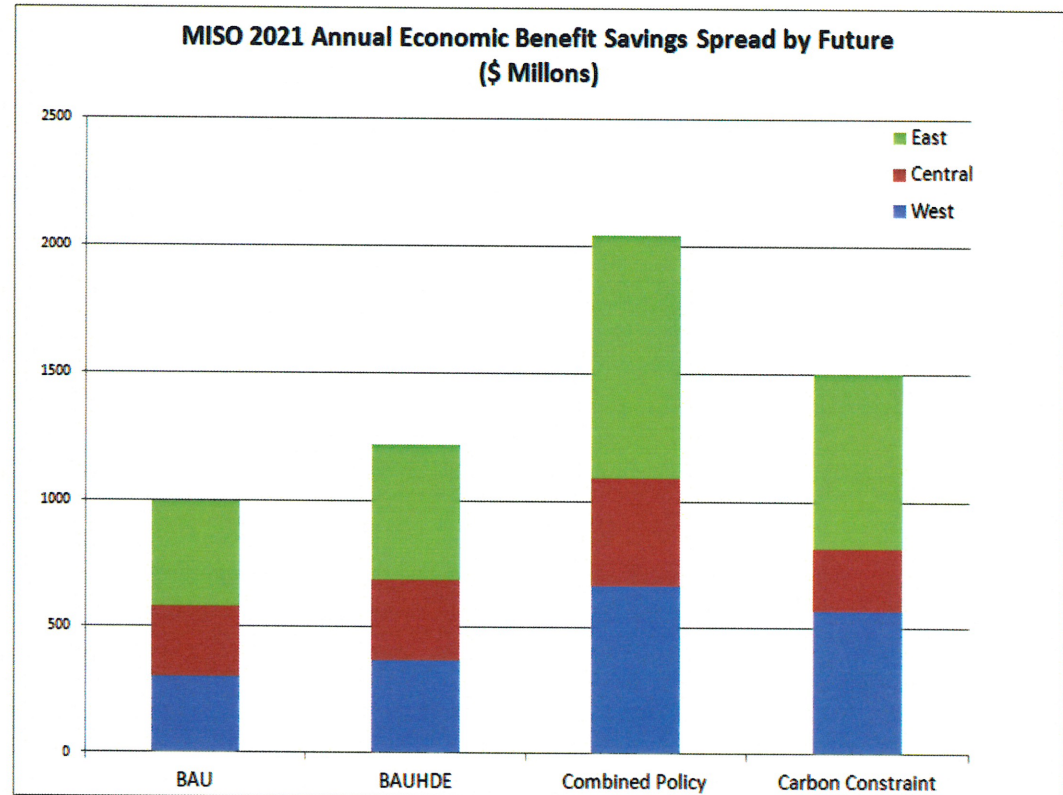
# MVP Criterion 1

A Multi Value Project must

- Enable the Transmission System to reliably and economically deliver energy in support of documented energy policy mandates or laws that have been enacted or adopted through state or federal legislation or regulatory requirement that directly or indirectly govern the minimum or maximum amount of energy that can be generated by specific types of generation.
- The MVP must be shown to enable the transmission system to deliver such energy in a manner that is more reliable and/or more economic than it otherwise would be without the transmission upgrade.

# Candidate MVP Portfolio Benefits

- Brookings Project is part of the broader Candidate MVP Portfolio, which provides widespread benefits across the MISO footprint
- The 20-year Benefit-to-Cost ratio of the portfolio, when only Production Cost benefits are included, ranges from 1.1 – 2.8



# Out of Cycle Project Requests

- Out of Cycle requests for a shortened stakeholder review period are provided for under Tariff Attachment FF in order to
  - Enable Transmission Owners to respond in a timely fashion to significant new load additions
  - Enable responses to other new system needs which require budgeting, regulatory milestones, construction, or other aspects of a project development to proceed prior to the next scheduled MTEP approval

# MTEP June 2011 Report

Project Documentation and Approval  
Recommendations





## **Contents**

<b>Candidate MVP Portfolio Analysis Interim Report Executive Summary.....</b>	<b>1</b>
<b>Straits Power Flow Control Project Documentation.....</b>	<b>6</b>
<b>Eaton Rapids Load Interconnection Project Documentation .....</b>	<b>8</b>
<b>Appendix 1: Candidate MVP Portfolio Analysis Interim Report.....</b>	<b>9</b>
<b>Appendix 2: Indicative MVP Usage Rate Estimates .....</b>	<b>32</b>
<b>Appendix 3: Straits Cost Allocation.....</b>	<b>33</b>
<b>Appendix 4: Eaton Rapids Project Additional Documentation.....</b>	<b>34</b>
<b>Appendix 5: Stakeholder Substantive Comments and MISO Responses .....</b>	<b>40</b>

# Candidate MVP Portfolio Analysis June 2011 Interim Report

## Executive Summary

This document presents the MISO Staff recommendation that the Brookings to Twin Cities 345kV project (Brookings Project) be conditionally approved as a part of a broader system portfolio of transmission expansion projects that form a Multi Value Project (MVP) portfolio. The Brookings Project is recommended for inclusion in MTEP Appendix A in June 2011. The remainder of the Candidate MVP Portfolio is expected to be recommended for approval at the November or December 2011 MISO Board of Directors meeting after the completion of the business case for the remaining projects in the portfolio.

The Brookings Project is the second project in the Candidate MVP portfolio recommended for approval, following the Michigan Thumb Loop MVP, which was approved by the MISO Board of Directors in August 2010. Like the Michigan Thumb Loop MVP, the Brookings Project clearly meets the tariff criterion to be an MVP and demonstrates substantial reliability, public policy, and economic benefits to the transmission system. Moreover, when taken as a part of the Candidate MVP Portfolio, the Michigan Thumb Loop and Brookings Projects enable the energy policy mandates of the MISO states to be met reliably and with enhanced economic value. The Candidate MVP Portfolio will distribute this value regionally across the MISO system in a manner roughly commensurate with the portfolio's costs.

The past decade has seen great changes in public policy, which have driven subsequent changes in how the transmission system is planned. Societal pressures related to the environment have led to the recent adoption of Renewable Portfolio Standards (RPS) across the MISO footprint, as shown in Figure 1. In turn, these RPS mandates have driven the need for a more regional and robust transmission system to deliver renewable resources from the often remote renewable energy generators to load centers.

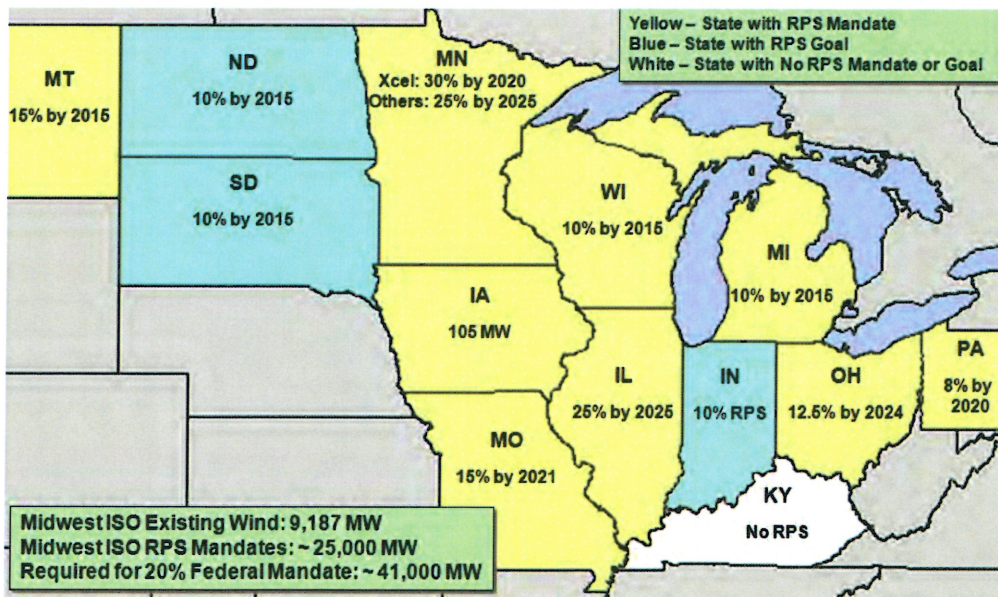


Figure 1: RPS Mandates and Goals Within the MISO Footprint<sup>1</sup>

<sup>1</sup> Existing wind projected to be in-service as of March 1, 2011. State RPS mandates and goals include all policies signed into law by June 1, 2011.

In 2008, MISO, with the assistance of state regulators and industry stakeholders, began the Regional Generation Outlet Study (RGOS) to develop a set of transmission portfolios that will help Load Serving Entities (LSEs) to meet their RPS mandates at the lowest delivered wholesale energy cost. RGOS was premised upon a regional set of wind zones, represented in Figure 2, chosen in conjunction with the MISO states via a least-cost wind siting methodology.

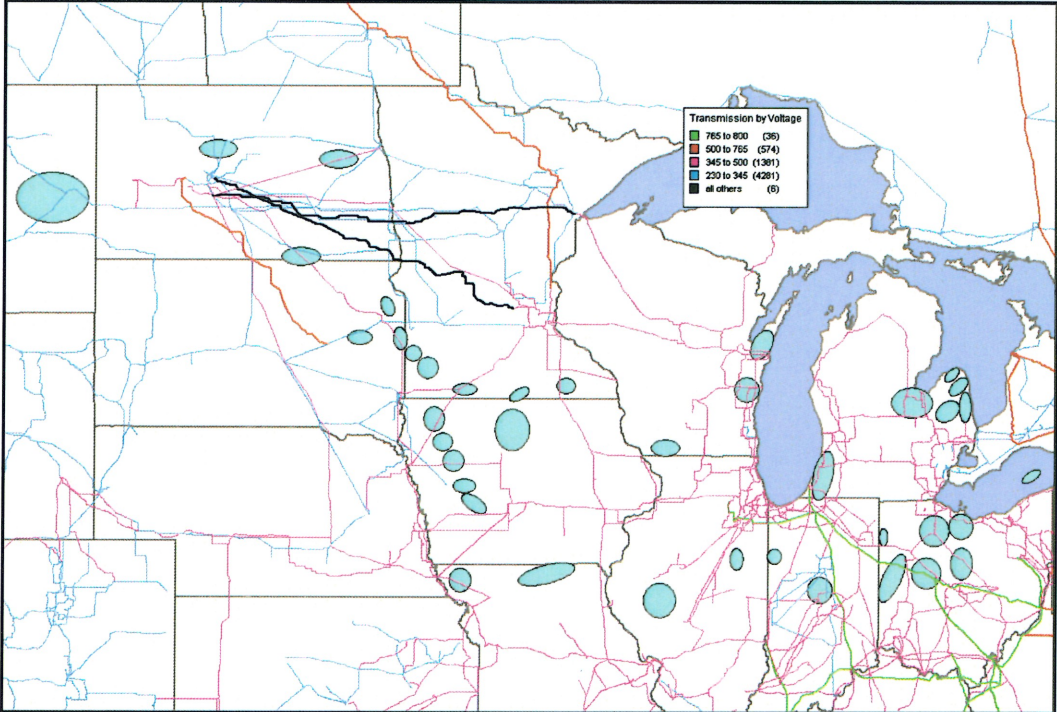


Figure 2: RGOS and Candidate MVP Incremental Energy Zones

At the conclusion of the RGOS analysis, a set of projects compatible with all three RGOS portfolios were identified. These projects, along with complimentary projects from recent MISO congestion analyses and planning studies, created the 2011 Candidate MVP Portfolio, shown in Figure 3. This portfolio represents the set of “no regrets” projects that will provide multiple kinds of reliability and economic benefits under all alternative futures.

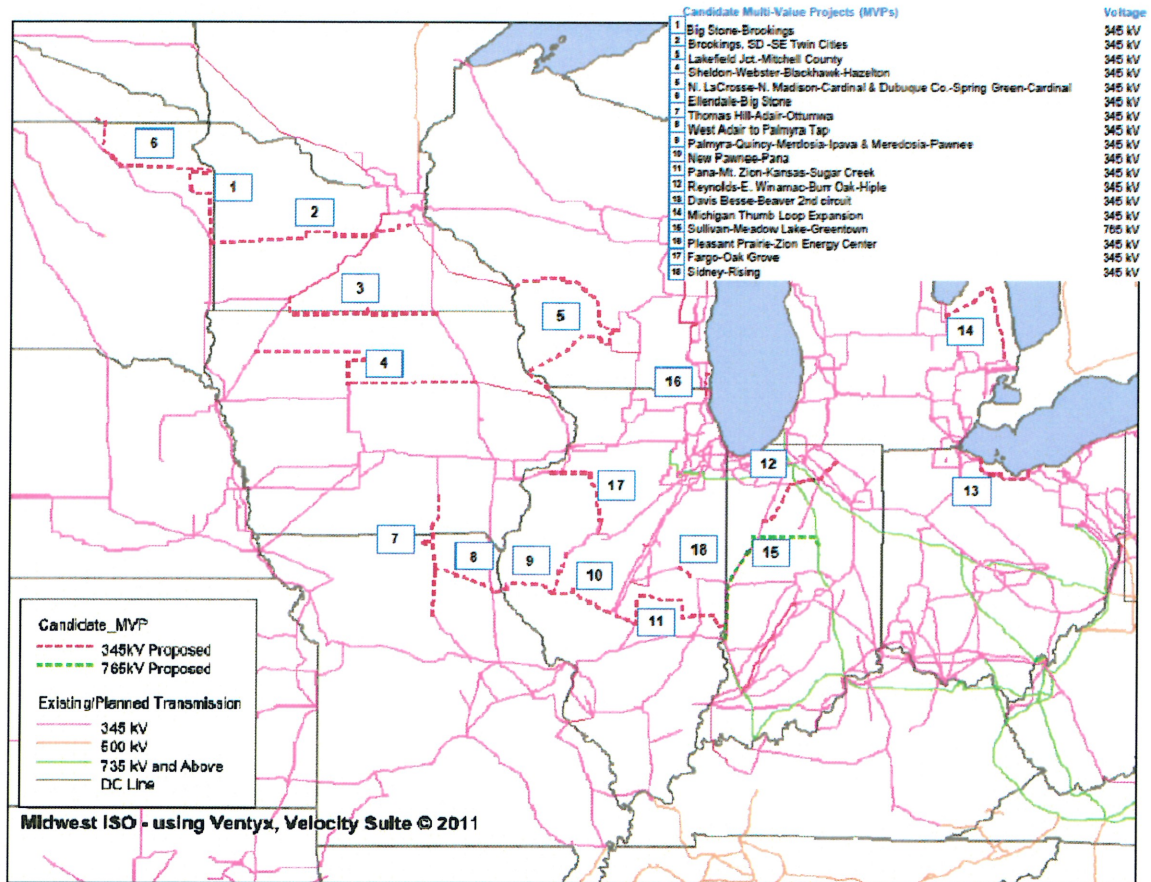


Figure 3: 2011 Candidate MVP Portfolio

The 2011 Candidate MVP Portfolio analysis was initiated to determine a high-value transmission portfolio which will enable the MISO LSEs meet their near-term RPS mandates. This study evaluates the Candidate MVP Portfolio against the MVP cost allocation criterion to design a portfolio which provides widespread benefits as a first step towards a regional transmission solution. The final portfolio will reduce the wholesale cost of energy delivery for the consumer by enabling the delivery of low cost generation to load, reducing congestion costs, and increasing the system reliability, regardless of the future generation mix.

The MISO staff recommends the Brookings Project, shown below in Figure 4 to the MISO Board of Directors for conditional approval in June of 2011. This recommendation is based upon the evaluation of the project against MVP cost allocation criterion 1, which requires transmission to reliably enable the delivery of energy in support of public policy, such as renewable energy mandates. The approval will be conditional upon the Board acceptance of the final 2011 Candidate MVP Portfolio study report.

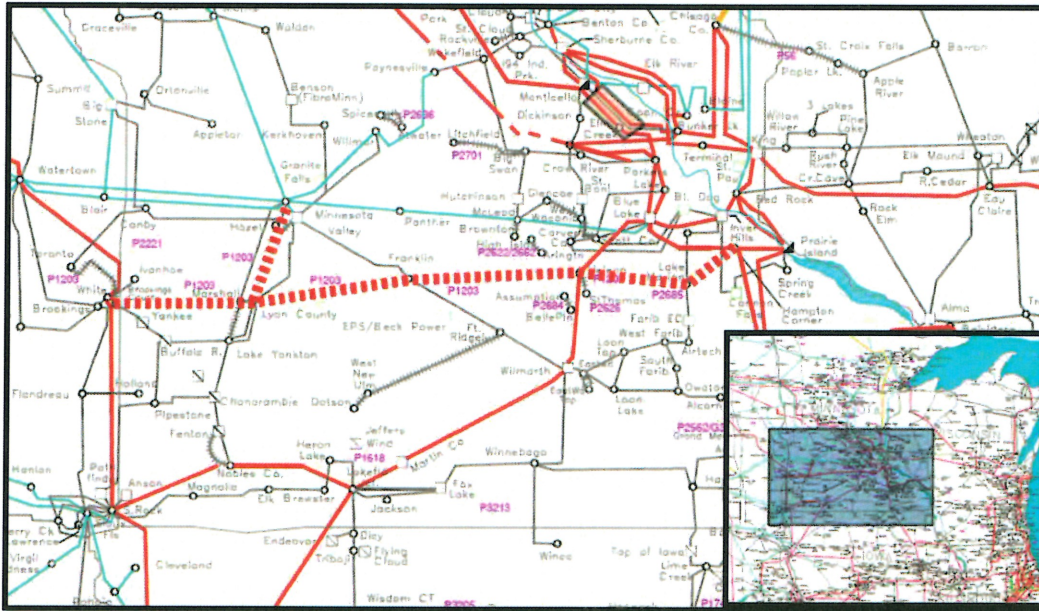


Figure 4: Brookings Project

The Brookings Project supports the delivery of renewable energy, as required by the public policy mandates, in a manner that is more reliable than it would be without the transmission upgrade. Specifically, the project mitigates approximately 3,485 different transmission outage conditions, for steady state and transient conditions under both peak and shoulder load scenarios. Some of these conditions would be severe enough to cause cascading outages on the system. Through the mitigation of these constraints, approximately 2,050 MW of nameplate renewable capacity may be delivered to load centers in the Twin Cities of Minnesota and beyond.

Table 1: Brookings Project Valuation

Analysis Name	Key Findings
<b>Steady state:</b>	3,299 transmission outage conditions are mitigated through the addition of the Brookings Project.
<b>Shoulder Peak</b>	
<b>Steady state:</b>	180 transmission outage conditions were mitigated through the addition of the Brookings Project
<b>Summer Peak</b>	
<b>Transient stability:</b>	7 transient stability violations were mitigated or alleviated through the addition of the Brookings Project
<b>Shoulder Peak</b>	
<b>Wind capacity Enabled</b>	Mitigation of reliability issues enables the delivery of 2,049 MW of nameplate wind capacity This is equivalent to about 15% of the existing state RPS requirements

Although the Brookings Project is justified based on the benefits discussed previously, the project is also expected to provide additional economic and reliability benefits as an integrated part of the full MVP Portfolio. The overall MVP Portfolio will serve to improve the overall reliability of the transmission system while spreading the economic benefits of lower-cost generation throughout the footprint. Under a variety

of different potential future policy scenarios, the Candidate MVP Portfolio consistently delivers widespread regional benefits to the transmission system. For example, based on an analysis of the Adjusted Production Cost (APC), the Candidate MVP Portfolio has an estimated 20-year Net Present Value (NPV) of \$13.5 to \$33.4 billion, resulting in a 20-year benefit-to-cost ratio of 1.12 to 2.77.

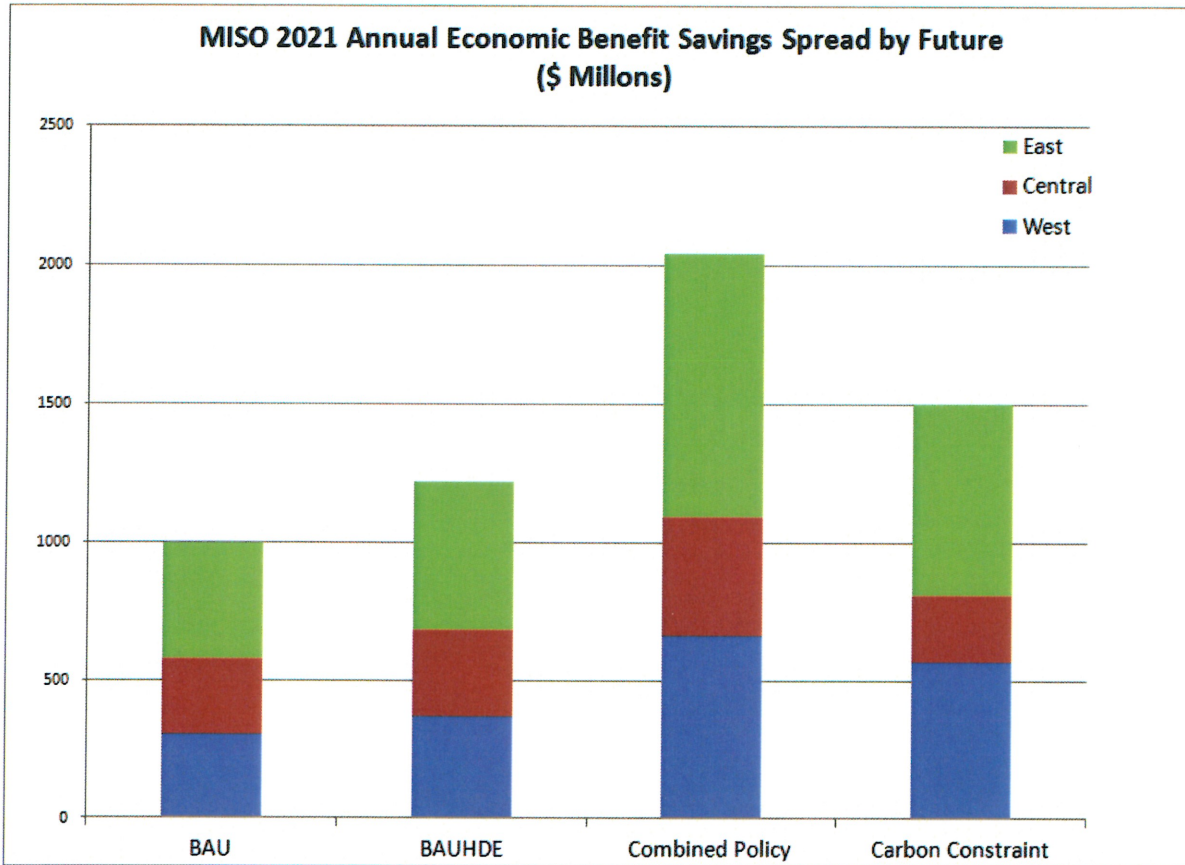


Figure 5: Candidate MVP Portfolio Preliminary Benefits Spread<sup>2</sup>

Although ideally all the projects in the final 2011 MVP Portfolio would be approved at the same time, in certain instances, it is neither feasible nor desirable to wait. For example, the Michigan Thumb Loop project, which is a component of the final 2011 MVP Portfolio, was approved in August of 2010 due to construction and RPS timelines. Likewise, the Brookings Project requires a conditional approval prior to the remainder of the portfolio based on regulatory risks, potential cost penalties, and construction timelines.

The Brookings Project has achieved all of its regulatory approvals barring one at the present time, and it is expected to achieve its last regulatory approval in June 2011. These approvals are premised upon a 2015 in-service date, and right-of-way acquisition must start in the fall of 2011 to enable this in-service date. Similarly, a delayed project approval could drive an additional \$15 million in project costs, due to material supply and construction schedule modifications. Finally, the business case for the Brookings Project has been completed, and the project has been fully justified.

<sup>2</sup>First Energy was not included in the benefit calculations. Duke Ohio was included in the Central subregion.

## Straits Power Flow Control June 2011 MTEP Documentation

### Project Description

The Straits Flow Control Project (P2846) will install a 200 MW back-to-back HVDC Power Flow Control device connected in series with the Straits-McGulpin 138kV lines. The project is needed to control excessive flows predominantly west to east that have resulted in long standing operational reliability issues. There is insufficient local generation in the area to control the flows as needed to maintain flows within reliable design limits. The back-to-back HVDC flow control solution will provide robust voltage control with dynamic real power control capabilities to both the Upper Peninsula (U.P.) and Lower Peninsula of Michigan. Furthermore, it will provide frequency control and black start functionality during extreme events. The total estimated cost of this project is \$90,000,000, and its expected in-service date is August 1, 2014. It is a Baseline Reliability Project (BRP) eligible for cost sharing.

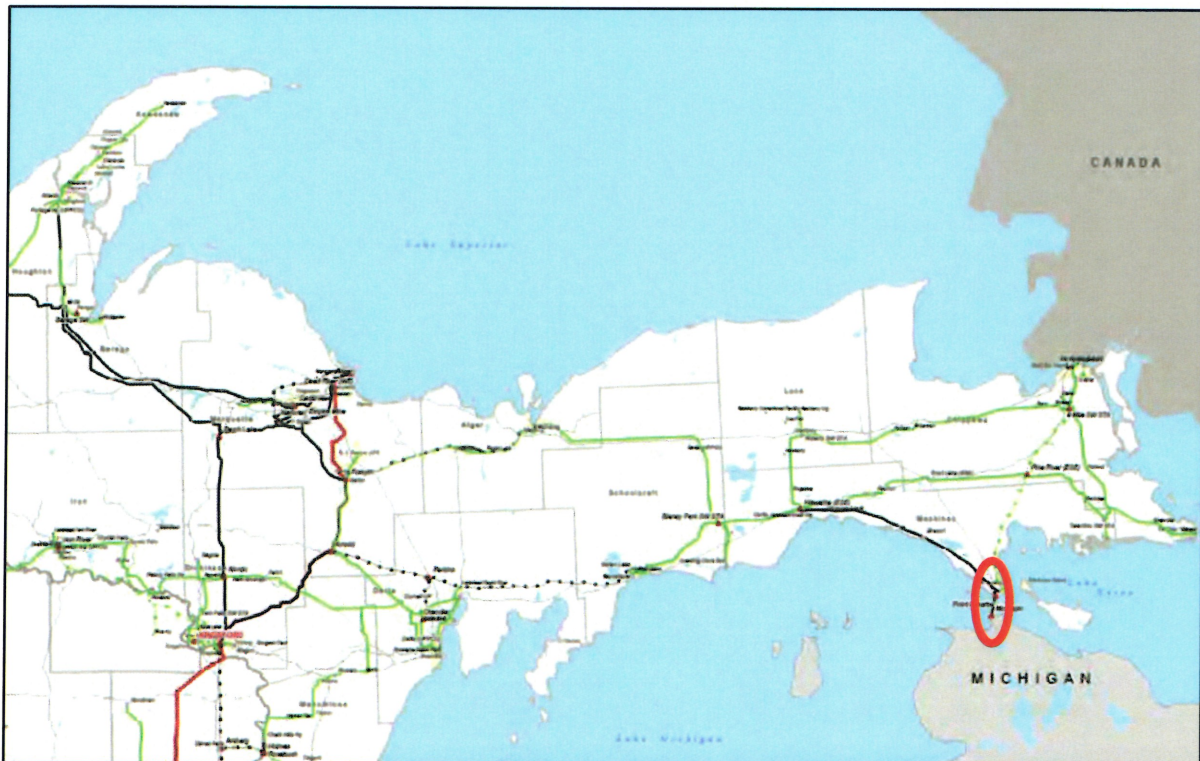


Figure 6: Geographic Transmission Map of Project Area

## System Needs

The eastern U.P. of Michigan is currently regularly exposed to high system flows from west to east during off-peak conditions. When these west to east flows occur through the eastern U.P., inadequate voltages in the area are observed by operating personnel. In addition, single contingency thermal line loading violations are also observed under some conditions with high west to east transfers.

Current measures taken to address the high flows include either an extensive and expensive generation redispatch to adjust the power flows or when insufficient, the manual split of the transmission system to eliminate the flows through the U.P. However, splitting the U.P. system causes numerous additional operational issues and causes maintenance scheduling to become difficult and expensive. As a result, splitting the eastern U.P. has become increasingly unreliable, and the incidence of having to resort to split operation mode has been increasing.

## Analysis

The HVDC solution will be able to control the flow during all hours to levels necessary to maintain reliable supply to loads on both sides of the straits. Conventional AC solutions were considered to address the high flows and avoid splitting the U.P. system but were found to be infeasible.

The two alternatives considered were flow control via use of phase angle regulating transformers (PARs), or substantial upgrades to the upper and lower peninsula systems including expanded high 345 kV supplies. This latter alternative would be many times more costly than the recommended solution.

The primary alternative considered was to install 60 degree phase angle regulating transformers (PARs), one on each of the two Straits-McGulpin 138kV lines to manage current and future system flows. This alternative was found to be insufficient, as the phase shifting transformer performance is not adequate to manage system flows. The ability of the PARs to adequately control flows depends on the system conditions resulting in the strong west to east flow patterns observed in actual operations. At historical flow levels, the angle needed to be controlled by the PARs would be greater than the regulating range of the equipment.

## Eaton Rapids Load Interconnection Project June 2011 MTEP Documentation

### Project Description and Need

The City of Eaton Rapids, a MISO Network Customer, has a new industrial customer - an electric foundry operation (URV USA) with machining and painting operations associated with new wind turbine blades. Governor Granholm provided a letter to the MISO in late 2010 describing the importance of this new load, and requesting its expeditious connection. The anticipated load for this new customer is approximately 40 MW. Due to the need for an uninterrupted power supply and planned around-the-clock operation, the load will be served with a looped 138 kV Network Upgrade to the site by January 2013. The estimated project cost is \$28.5 million.

The transmission supply build-out is being implemented in two phases. The first phase involves a new radial transmission feed into the foundry which will accommodate the initial 20 MW addition by January 2012. The 2<sup>nd</sup> phase of the project will complete the looped Network Upgrade and provide the firm supply to the full 40 MW load by January 2013. Consumers Energy will implement Phase 1 and transfer ownership to METC when the 2<sup>nd</sup> phase of the project is completed.

Phase 1 will be implemented by rebuilding an existing distribution line and connecting it to a new substation along the existing Delhi to Tompkins 138 kV line at URV Junction approximately 8 miles east of the foundry and rebuilding distribution line to this new load.

Phase 2 involves completing the looped supply to the new load by rebuilding an existing 69 kV line and connecting it to a second new substation along the Delhi to Island Road 138 kV line approximately 11 miles west of the new load.

MISO received the required Out-of-Cycle (OOC) request for this project on April 13, 2011 with a requested MISO approval on June 16, 2011 in order to accommodate the aggressive in service dates. This OOC request form is included as Appendix 4.1. Appendix 4.2 is a project justification document provided by METC in support of the OOC request that describes the project and alternatives considered.

The project is treated as "Other" for cost allocation purposes meaning that it is recovered from the local pricing zone.

# Appendix 1

## Candidate MVP Portfolio Analysis June 2011 Interim Report

### Contents

<b>Study Overview .....</b>	<b>10</b>
<i>MISO Planning Approach.....</i>	<i>10</i>
<i>Multi Value Project (MVP) Portfolio Drivers .....</i>	<i>12</i>
Tariff Requirements .....	12
Public Policy Needs .....	13
Wind Siting Strategy .....	13
Enhanced Reliability and Economic Drivers .....	15
Transmission Strategy .....	15
<i>Development of the Candidate MVP Portfolio.....</i>	<i>15</i>
<i>Candidate MVP Portfolio Analysis .....</i>	<i>15</i>
<i>Progress to Date .....</i>	<i>16</i>
Completed Analyses.....	16
Remaining Work .....	17
<b>Key Results .....</b>	<b>18</b>
<i>Michigan Thumb Loop Project .....</i>	<i>19</i>
<i>Brookings County to Twin Cities 345 kV Project.....</i>	<i>20</i>
Evaluation Against MVP Criterion.....	21
Project Valuation.....	22
Underbuild Requirements .....	23
Components Analysis .....	23
Sensitivities to Other Projects in the Portfolio.....	24
<i>Candidate MVP Portfolio Overview.....</i>	<i>27</i>
Preliminary Portfolio Economic Value Quantification and Spread .....	28
Additional Project and Portfolio Benefits.....	30
<b>Conclusions and Recommendations .....</b>	<b>31</b>

# 1 Study Overview

## 1.1 MISO Planning Approach

The goal of the MISO planning process is to develop a comprehensive expansion plan that reflects a fully integrated view of project value inclusive of reliability, market efficiency, public policy, and other value drivers across all planning horizons. This process is guided by a set of principles established by the MISO Board of Directors, initially adopted on August 18, 2005. The principles were created in an effort to improve and guide transmission investment in the region and to furnish an element of strategic direction to the MISO transmission planning process. These principles, reconfirmed in August 2009, are as follows:

- **Guiding Principle 1:** Make the benefits of a competitive energy market available to customers by providing access to the lowest possible electric energy costs
- **Guiding Principle 2:** Provide a transmission infrastructure that safeguards local and regional reliability and supports interconnection-wide reliability
- **Guiding Principle 3:** Support state and federal renewable energy objectives by planning for access to all such resources (e.g. wind, biomass, demand side management)
- **Guiding Principle 4:** Provide an appropriate cost allocation mechanism
- **Guiding Principle 5:** Develop a transmission system scenario model and make it available to state and federal energy policy makers to provide context and inform the choices they face

A number of conditions must be met in order to build longer-term transmission able to support future generation growth and accommodate new energy policy imperatives. These conditions are intertwined with the planning principles put forth by the MISO Board of Directors and supported by an integrated, inclusive transmission planning approach. The conditions that must be met in order to build transmission include:

- A robust business case that demonstrates value sufficient to support the construction of the transmission project
- Increased consensus on current and future energy policies
- A regional tariff that matches who benefits with who pays over time
- Cost recovery mechanisms that reduce financial risk

In order to ensure that the costs of transmission are allocated in a manner that is roughly commensurate with their benefits, MISO has developed several different types of cost allocation methodologies through open, stakeholder driven forums. This transmission cost allocation approach, as shown below in Table 1.1, seeks to match the business case with the allocation method.

**Table 1.1: MISO Transmission Cost Allocation Methodology**

Allocation Category	Driver(s)	Allocation to Beneficiaries
<b>Participant Funded ("Other")</b>	Transmission Owner identified project that does not qualify for other cost allocation mechanisms.	Paid by requestor (local zone)
<b>Generator Interconnection Project</b>	Interconnection Request	Paid for by requestor; 345 kV and above 10% postage stamp to load
<b>Market Efficiency Project</b>	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
<b>Baseline Reliability Project</b>	NERC Reliability Criteria	Primarily shared locally through Line Outage Distribution Factor Methodology; 345 kV and above 20% postage stamp to load
<b>Multi Value Project</b>	Address energy policy laws and/or provide widespread benefits across footprint	100% postage stamp to load

The fundamental goal of the MISO's planning process is to develop a comprehensive expansion plan that meets the reliability, policy, and economic needs of the system. This goal is accomplished through the implementation of a top-down, bottom up planning process, creating a consolidated transmission plan which delivers regional value while meeting near term system needs.

## 1.2 Multi Value Project Portfolio Drivers

The 2011 Candidate MVP Portfolio Analysis is based upon the need to economically and reliably help states meet their public policy needs. In particular, the study is designed to build the robust business case required to build transmission, as discussed previously. The study will establish a regional transmission strategy that enables the MISO Load Serving Entities (LSEs) to meet their Renewable Portfolio Standards (RPS).

It is important to note, while the study focuses upon the RPS requirements, the transmission portfolio will ultimately have widespread benefits beyond the delivery of wind. It will enhance system reliability and efficiency under a variety of different generation build outs. It will also act to open up markets to competition, reducing congestion and spreading the benefits of low-cost generation across the MISO footprint. The Candidate MVP Portfolio Analysis scope has been designed to identify and maximize the total benefits of the transmission portfolio, including the reliability, economic, and public policy drivers.

### 1.2.1 Tariff Requirements

The Candidate MVP Portfolio analysis is premised upon the MVP criterion described in Attachment FF of the MISO Tariff and shown below.

#### Criterion 1

A Multi Value Project must be developed through the transmission expansion planning process for the purpose of enabling the Transmission System to reliably and economically deliver energy in support of documented energy policy mandates or laws that have been enacted or adopted through state or federal legislation or regulatory requirement that directly or indirectly govern the minimum or maximum amount of energy that can be generated by specific types of generation. The MVP must be shown to enable the transmission system to deliver such energy in a manner that is more reliable and/or more economic than it otherwise would be without the transmission upgrade.

#### Criterion 2

A Multi Value Project must provide multiple types of economic value across multiple pricing zones with a Total MVP Benefit-to-Cost ratio of 1.0 or higher where the Total MVP Benefit-to-Cost ratio is described in Section II.C.7 of Attachment FF to the MISO Tariff. The reduction of production costs and the associated reduction of LMPs resulting from a transmission congestion relief project are not additive and are considered a single type of economic value.

#### Criterion 3

A Multi Value Project must address at least one Transmission Issue associated with a projected violation of a NERC or Regional Entity standard and at least one economic-based Transmission Issue that provides economic value across multiple pricing zones. The project must generate total financially quantifiable benefits, including quantifiable reliability benefits, in excess of the total project costs based on the definition of financial benefits and Project Costs provided in Section II.C.6 of Attachment FF.

The MVP cost allocation criterion requires the evaluation of the portfolio on a reliability, economic, and energy delivery basis. The scope of the analysis, shown in Section 3, was designed to demonstrate this value, both on a project and portfolio basis.

### 1.2.2 Public Policy Needs

Currently, 11 out of 13 states in the MISO footprint have enacted either RPS requirements or renewable energy goals which require or recommend varying amounts of load be served with energy from renewable energy resources. The Candidate MVP Portfolio study is focused on the transmission necessary to economically and reliably meet the state RPS mandates. More details on these renewable energy requirements and goals may be seen in Figure 1.1 below.

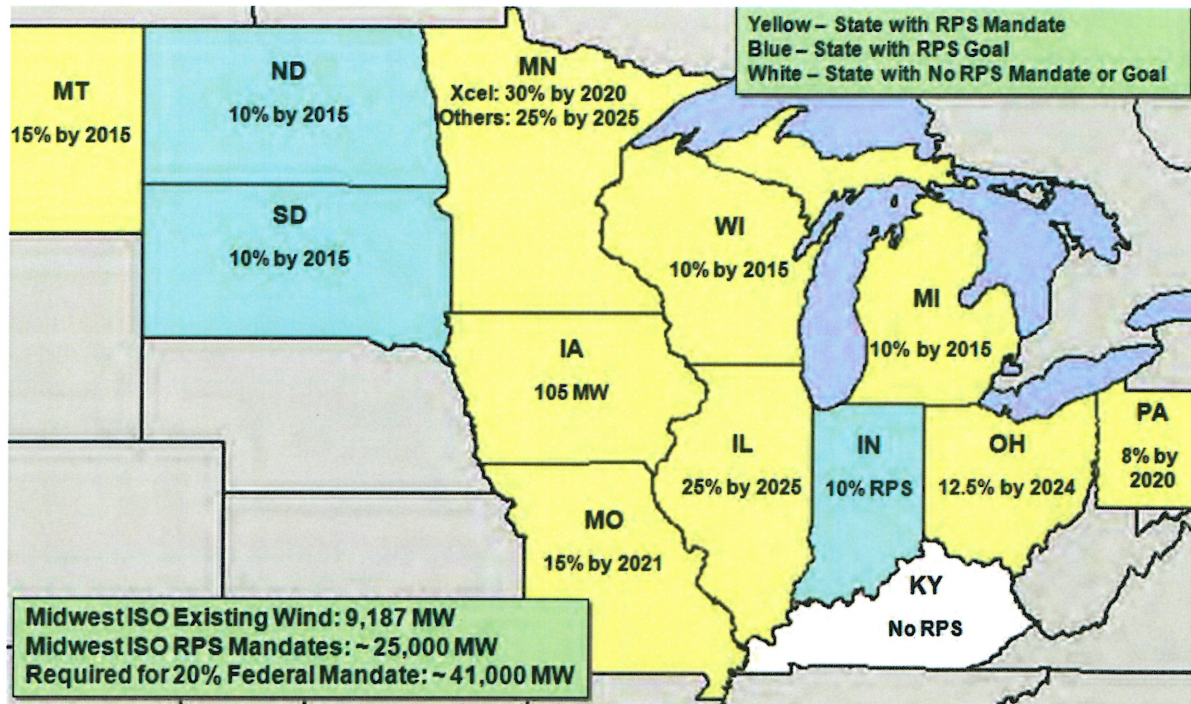


Figure 1.1: RPS Mandates and Goals Within the MISO Footprint

RPS mandates vary from state to state in specific requirements and implementation timing, but they generally start in about 2010 and continue on into the next decade. While the state laws support a number of different types of renewable resources, and multiple types of renewable resources will play a role in meeting state RPS mandates, the majority of renewable energy resources installed in the foreseeable future will likely be wind resources. A summary of the state-by-state renewable energy mandates are included in Appendix 1 to the Candidate MVP Interim Report.

### 1.2.3 Wind Siting Strategy

In 2009, MISO developed a set of potential energy zones, or locations where wind generation could feasibly be located, on a state-by-state basis<sup>3</sup>. In conjunction with state regulators and other stakeholders, MISO then used these zones to explore a number of long-term transmission and generation strategies to meet the state RPS requirements. These analyses focused on the tradeoffs between local wind generation, which typically requires less transmission expansion at the cost of a larger amount of wind

<sup>3</sup> More information on the zone development may be found in the RGOS report at <http://www.midwestiso.org/Library/Repository/Study/RGOS/Regional%20Generation%20Outlet%20Study.pdf>.

turbines, and regional wind generation, which requires fewer wind resources at the cost of higher levels of transmission expansion.

The study results demonstrated that the least-cost approach to wind generation siting, when both generation and transmission capital costs are considered, is a combination of local and regional wind generation locations, as shown by the white area on Figure 1.2. This approach was affirmed by the Midwest Governors' Association as the best method for wind zone selection and used as the basis for the final phase of the RGOS analysis in 2010. It was also used as the basis for the wind siting approach for the Candidate MVP Portfolio Analysis. The set of energy zones chosen for the Candidate MVP Portfolio analysis are shown below in Figure 1.3 as blue circles.

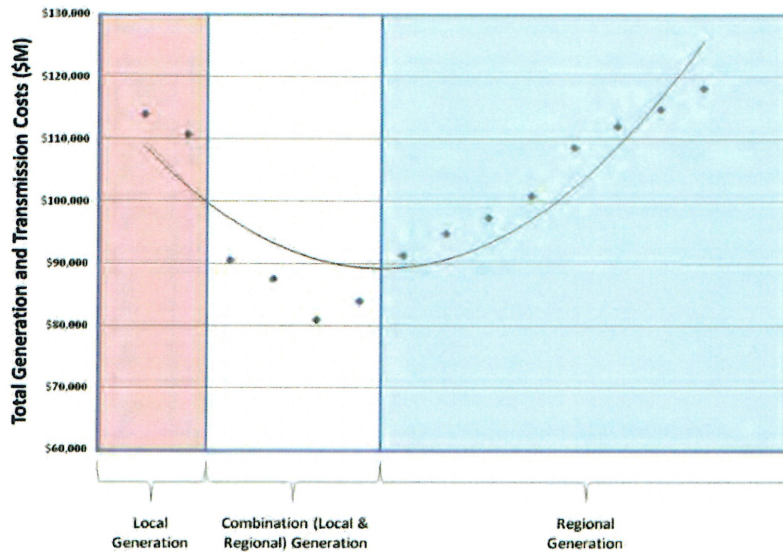


Figure 1.2: Capital Costs of Transmission and Generation

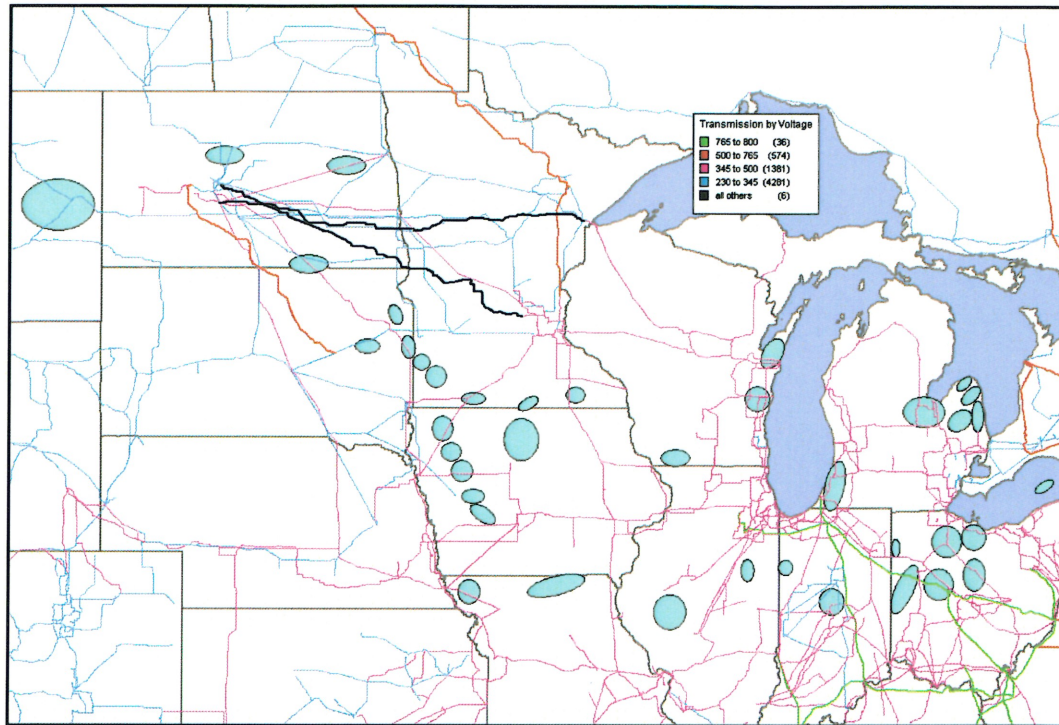


Figure 1.3: Candidate MVP Incremental Energy Zones

### 1.2.4 Enhanced Reliability and Economic Drivers

The goal of the MISO planning process is to deliver energy to load at the lowest possible cost. This requires a strategy that is premised upon a least-cost approach to both transmission and generation investment. This premise supports the overall constructability of the transmission portfolio, while reducing transmission risk associated with overbuilding the system. An introduction to the study drivers for the Candidate MVP Portfolio analysis is provided below; these drivers are supported and elaborated upon throughout the remainder of the interim report and documentation.

### 1.2.5 Transmission Strategy

A regional transmission strategy allows for significant amounts of economic and reliability benefits to be realized by MISO load on a regional basis. Regional transmission will increase the reliability of the MISO footprint, open up the market to increased competition, and provide access to low-cost generation, regardless of fuel type. Development of a strong regional transmission backbone is analogous to the development of the United States interstate highway system, which while developed for specific reasons, has resulted in numerous additional benefits over the subsequent years.

The overall transmission strategy for the Candidate MVP Portfolio is to take advantage of linkages between reliability and economic benefits to bring overall value to the entire MISO system. The portfolio is designed via both reliability and economic analyses, and several futures are analyzed to determine the robustness of the designed portfolio under a number of future potential policy bookends.

## 1.3 Development of the Candidate MVP Portfolio

In order to provide widespread benefits commensurate with cost allocation, MISO seeks to develop portfolios of MVP projects that provide widespread benefits across the footprint. Projects selected as candidates for possible recommendation within the broader portfolio are then evaluated to establish the business case for the portfolio.

The current Candidate MVP Portfolio is the first portfolio developed for review under the recent tariff revisions establishing the MVP classification of projects. It was developed by considering regional system enhancements that could potentially provide multiple types of value, including enhanced reliability, reduced congestion, increased market efficiency, reduced real power losses, and the deferral of otherwise needed capital investments in transmission. The portfolio was designed to enhance and complement the existing system performance, working synergistically amongst the individual elements of the portfolio and with the existing transmission grid to produce a more robust and efficient system. Ultimately, the first portfolio represents the set of “no regrets” projects that will provide benefits to the system in all futures.

## 1.4 Candidate MVP Portfolio Analysis

The Candidate MVP Portfolio analysis seeks to combine the MISO Board of Director Planning Principles and the conditions precedent to transmission construction in its evaluation of a transmission portfolio to meet public policy, economic, and reliability requirements. The analysis seeks to build a robust business case for the recommended transmission, using the newly created Multi Value Project (MVP) cost allocation methodology approved by the FERC. This proposed transmission will be tested against a variety of potential policy futures to maximize the value of the transmission portfolio and reduce any potential negative risks associated with its construction due to changes in future demand and energy growth. At the study’s conclusion, a justified portfolio of MVPs will be recommended for inclusion in MTEP Appendix A and, if approved by the MISO Board of Directors, subsequent construction.

The MVP cost allocation criterion requires the evaluation of the portfolio on a reliability, economic, and energy delivery basis. The scope of the analysis, discussed in detail in more detail in Appendix 2 to the Candidate MVP Interim Report, was designed to demonstrate this value, both on a project and portfolio basis.

## 1.5 Progress to Date

The Candidate MVP Portfolio Analysis is currently in progress. The analysis on the remainder of the portfolio will be completed later this year, and results will be available as part of the final MTEP11 Candidate MVP Portfolio approval report and in a full Candidate MVP Portfolio analysis report. More information on the current study progress, and the expected work remaining, is below.

### 1.5.1 Completed Analyses

Current analysis on the Candidate MVP Portfolio has focused on the value achieved through constructing the Brookings Project as part of the overall Candidate MVP Portfolio. These analyses included the following items and outputs:

**Table 1.2: June Approval Analyses and Output**

<b>Analysis Name</b>	<b>Analysis Output</b>	<b>Output Purpose</b>
<b>Steady state</b>	List of thermal overloads mitigated by the addition of the Brookings Project	Project valuation
<b>Transient stability</b>	List of violations mitigated or alleviated by the addition of the Brookings Project	Project valuation
<b>Components</b>	List of ancillary portions of the Brookings Project, as well as a determination of whether those project components are eligible for MVP cost allocation	Project valuation
<b>Portfolio sensitivities</b>	Confirmation that the Brookings Project is correctly sized, when other portfolio components are considered Demonstration that the majority of the constraints mitigated by the Brookings Project could not be mitigated by another project in the portfolio	Project valuation
<b>Production cost</b>	Adjusted Production Cost (APC) benefits of the entire Candidate MVP Portfolio	Portfolio valuation
<b>Underbuild requirements</b>	Document any incremental transmission required to mitigate constraints created by the addition of the Brookings Project to the system	No harm analysis

A detailed description of the steady state, components, and portfolio sensitivities analyses is included in Appendix 4 to the Candidate MVP Interim Report. This description includes information on the study models used, NERC events analyzed, and the results obtained. A similar description for the transient stability work is located in Appendix 5 to the Candidate MVP Interim Report.

### 1.5.2 Remaining work

Prior to the completion of the Candidate MVP Portfolio analysis, additional analyses must be performed to establish the most valuable design for the remainder of the 2011 MVP Portfolio. These analyses are outlined in the subsequent section.

The Brookings Project, currently recommended for conditional approval in June, as well as the Michigan Thumb loop project which was approved in 2010, will be included in the full portfolio analysis, which will be completed later in 2011.

**Table 1.3: Full Candidate MVP Portfolio Analyses and Output**

<b>Analysis Name</b>	<b>Analysis Output</b>	<b>Output Purpose</b>
<b>Steady state</b>	List of thermal overloads mitigated by the addition of projects in the final 2011 MVP Portfolio	Project valuation
<b>Transient stability</b>	List of violations mitigated by the addition of projects in the final 2011 MVP Portfolio	Project valuation
<b>Components</b>	List of ancillary portions of projects in the final 2011 MVP Portfolio, as well as a determination of whether those project components are eligible for MVP cost allocation	Project valuation
<b>Avoided capital investment (transmission)</b>	Document the cost avoided of generally lower voltage upgrades that would be needed without the projects in the final 2011 MVP portfolio	Project valuation
<b>Underbuild requirements</b>	Document any incremental transmission required to mitigate constraints created by the addition of the projects in the final 2011 MVP Portfolio	No harm analysis
<b>Short Circuit Analysis</b>	Determine if any incremental upgrades are required to mitigate any short circuit / breaker duty violations	No harm analysis
<b>Voltage Stability Analysis</b>	List of violations mitigated by the addition of projects in the final 2011 MVP Portfolio; confirmation that system reliability is maintained	No harm analysis
<b>Planning Reserve Margin (PRM) benefits</b>	Change in Zonal or System-wide Planning Reserve Margin requirements and related financial benefits of this change in requirements	Portfolio or project valuation
<b>Production cost</b>	Adjusted Production Cost (APC) benefits of the entire final 2011 MVP Portfolio	Portfolio valuation
<b>Avoided capital investment (generation)</b>	Quantification of the incremental wind generator capital cost savings enabled by the wind siting methodology supported by the final 2011 MVP Portfolio	Portfolio valuation
<b>Transmission loss reductions</b>	Change in system peak transmission losses and the related financial benefits of these avoided losses	Portfolio valuation
<b>Robustness Testing</b>	Quantification of portfolio benefits under various policy futures or transmission conditions	Portfolio valuation
<b>Installed capacity delivery</b>	Quantification of additional non-network resources that may be utilized as capacity resources due to the final 2011 MVP Portfolio	Portfolio valuation

## 2 Key Results

### 2.1 Michigan Thumb Loop Project

The Michigan Thumb Loop Project was approved by the MISO Board of Directors in August 2010 as the first project component of the 2011 MVP Portfolio. Although this project has already been approved, and thus does not require additional justification, it is important to recall that it is a portion of the final 2011 MVP Portfolio. The Michigan Thumb Loop project provides key benefits to the system through enabling the delivery of wind in the Thumb area of Michigan to load centers in Flint, Detroit, and beyond.

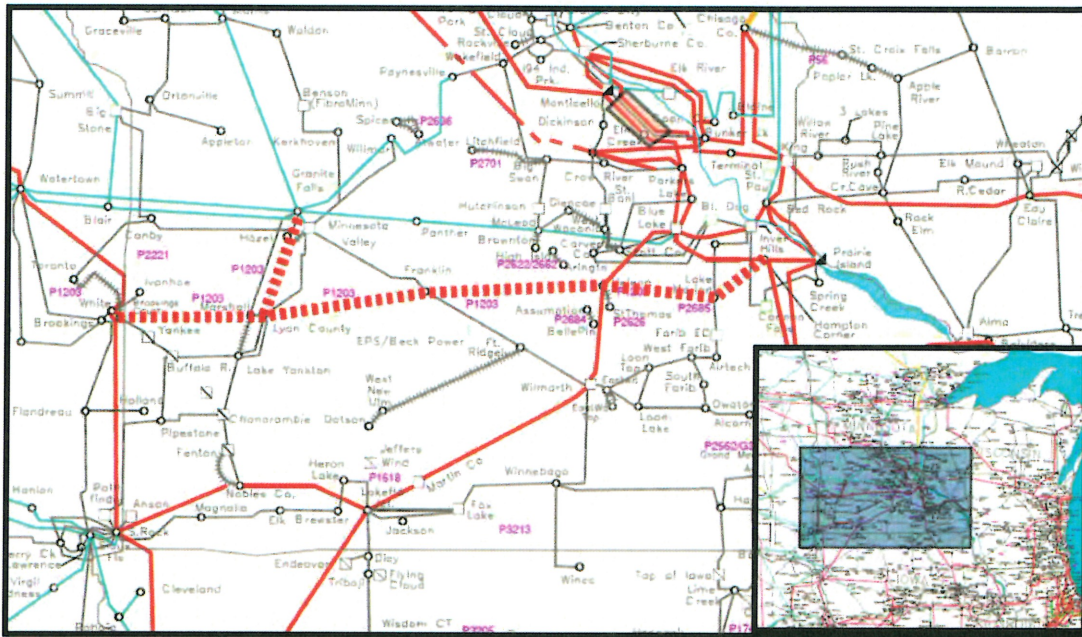


**Figure 2.1: Michigan Thumb Loop Project**

Additional information on the Michigan Thumb Loop project, its project justification, and its benefits may be found in the MTEP10 report at the following link:  
[http://www.midwestiso.org/Library/Repository/Study/MTEP/MTEP10/MTEP10\\_Appendix\\_D1\\_OOC\\_Project\\_Justifications\\_East\\_9162010.pdf](http://www.midwestiso.org/Library/Repository/Study/MTEP/MTEP10/MTEP10_Appendix_D1_OOC_Project_Justifications_East_9162010.pdf)

## 2.2 Brookings County to Twin Cities 345 kV Project

The Brookings Project is a 237 mile long 345 kV line from the Minnesota and South Dakota border to the Minneapolis / St. Paul region of Minnesota. It includes multiple 345 kV line segments and a subsystem of transformers supporting the lower voltage system at intermediate substations along the path of the line, with minor associated 115 kV upgrades. Its estimated cost is approximately \$730 million. Additional information on the project may be found in Appendix 3 to the Candidate MVP Interim Report.



**Figure 2.2: Brookings Project**

The purpose of the project is to deliver energy from the wind-rich region in southwestern Minnesota and eastern South Dakota to the load center at the Twin Cities of Minnesota and beyond. There is approximately 3100 MW of planned or proposed wind near the western terminal of the line.

### 2.2.1 Evaluation against MVP Criterion

For a project to be considered a Multi Value Project, it must meet one of three criterion which require regional benefits, based on a combination of public policy, reliability, and/or economic drivers. The Brookings Project was specifically evaluated against MVP criterion 1, which is quoted below:

A Multi Value Project must be developed through the transmission expansion planning process for the purpose of enabling the Transmission System to reliably and economically deliver energy in support of documented energy policy mandates or laws that have been enacted or adopted through state or federal legislation or regulatory requirement that directly or indirectly govern the minimum or maximum amount of energy that can be generated by specific types of generation. The MVP must be shown to enable the transmission system to deliver such energy in a manner that is more reliable and/or more economic than it otherwise would be without the transmission upgrade.

A summary of the project justification for the Brookings Project is shown in Table 2.1 below. These findings are discussed in greater detail in the subsequent sections.

**Table 2.1: Brookings Project Justification**

<b>Analysis Name</b>	<b>Key Findings</b>
<b>Steady state: Shoulder Peak</b>	3,299 transmission outage conditions are mitigated through the addition of the Brookings Project.
<b>Steady state: Summer Peak</b>	180 transmission outage conditions were mitigated through the addition of the Brookings Project
<b>Transient stability: Shoulder Peak</b>	7 transient stability violations were mitigated or alleviated through the addition of the Brookings Project
<b>Wind capacity enabled</b>	Mitigation of reliability issues enables the delivery of 2,049 MW of nameplate wind capacity This is equivalent to about 15% of the existing state RPS requirements

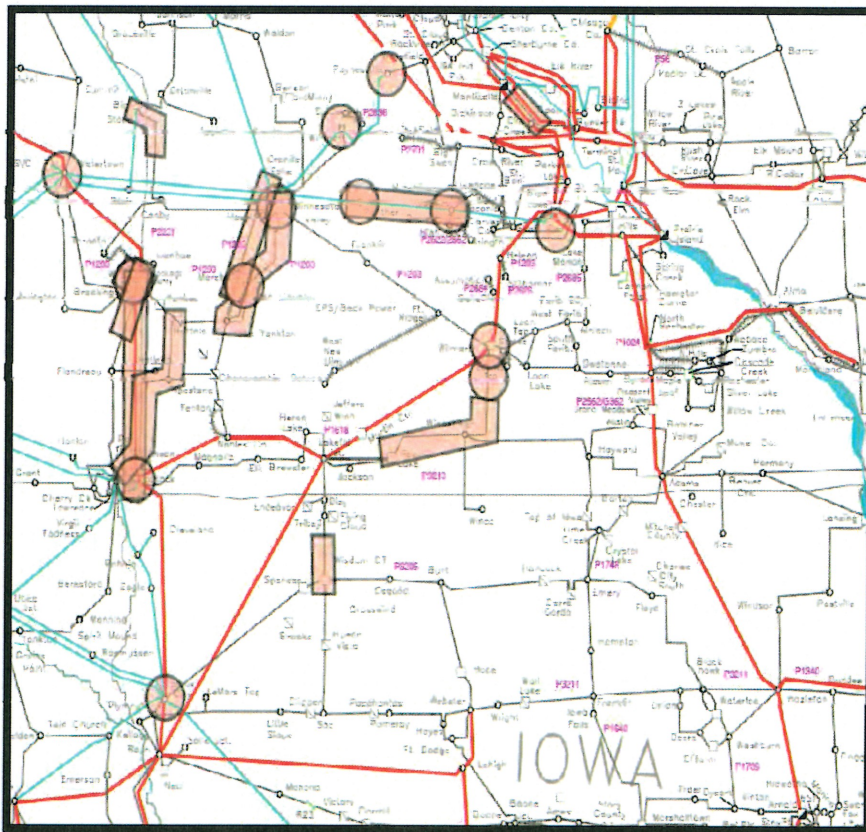
The Brookings Project supports the delivery of renewable energy, as required by the public policy mandates, in a manner that is more reliable than it would be without the transmission upgrade. Specifically, the project mitigates approximately 3,485 different transmission outage conditions, for steady state and transient conditions under both peak and shoulder load scenarios. Through the mitigation of these constraints, approximately 2,050 MW of nameplate renewable capacity may be delivered to load centers in the Twin Cities of Minnesota and beyond. Furthermore, although the Brookings Project is justified based on the benefits discussed above, the project is expected to provide additional economic and reliability benefits as an integrated part of the full MVP Portfolio. .

## 2.2.2 Project Valuation

The primary analysis and project valuation for the Brookings Project focused upon determining the ability of the project to more reliably deliver energy from wind rich areas to the load center of the Minneapolis / St. Paul twin cities. This determination occurred in three main areas: through a series of analyses on a shoulder peak case, through analyses on a summer peak case, and through an analysis of the wind capacity enabled by the Brookings Project.

### Shoulder Peak Evaluation

The Brookings Project creates a new outlet out of the Brookings / White region on the edge of South Dakota. Currently, White is connected via 345 kV lines to Watertown, South Dakota in the north and to Split Rock, South Dakota in the south. This configuration is heavily overloaded with the addition of the wind required to meet the state RPS mandates; over 1,000 single events on the system result in overloads of the White to Split Rock outlet path. Likewise, the outage of White to Split Rock pushes power north to Watertown, overloading transformers and lower voltage equipment. These overloads extend past the South Dakota / Minnesota border into the middle and southern portion of Minnesota, under a variety of different contingent events, as shown in Figure 2.3 below.



**Figure 2.3: Overloads Mitigated by the Brookings Project**

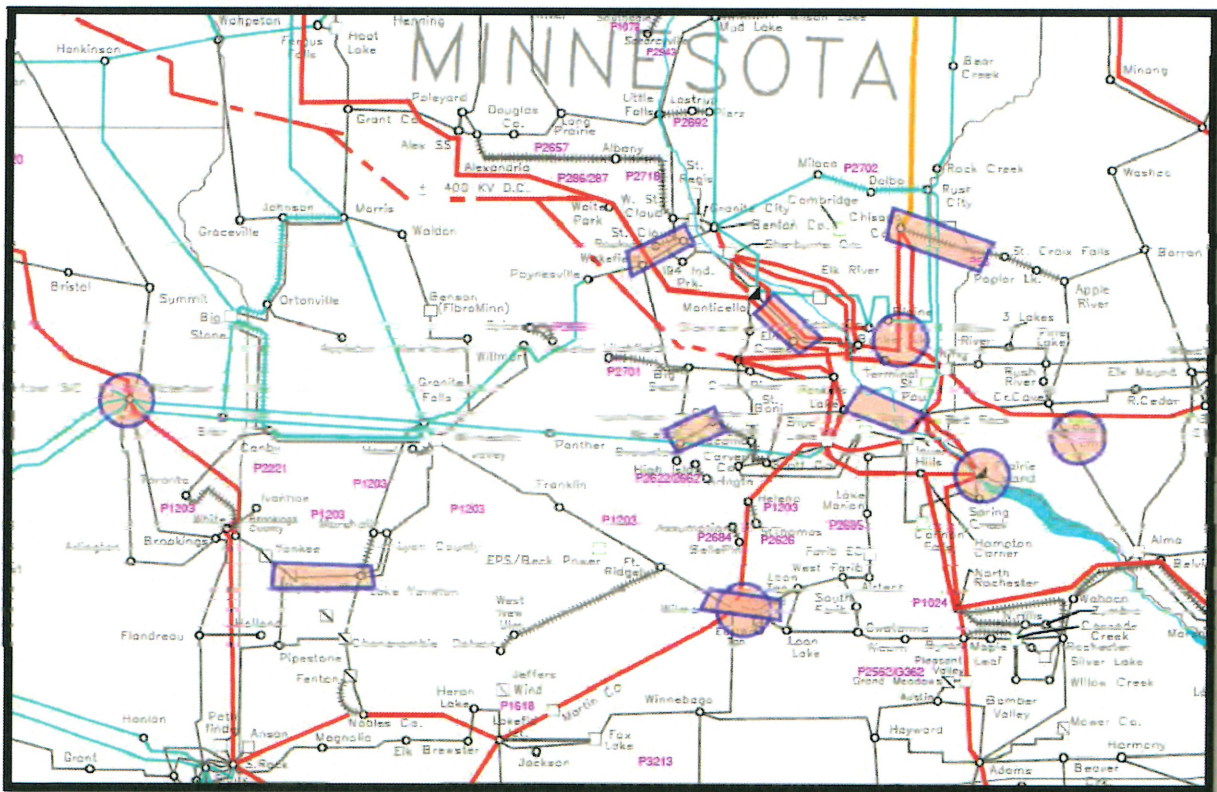
Specifically, the Brookings Project mitigates 3,300 different transmission outage conditions which would otherwise result in heavily loaded or overloaded system elements under shoulder peak conditions. This includes seven conditions which would result in transient system instability without the project or other mitigation. Additionally, some steady state overloads are of sufficient magnitude that it is expected they would cause uncontrolled tripping or cascading thermal failures.

More information on individual constraints and loadings may be found in Appendix 4 to the Candidate MVP Interim Report. Stability results may also be found in Appendix 5 of the same document.

Summer Peak Evaluation

The Brookings Project shows additional value when it is evaluated under summer peak conditions, when wind output tends to be at lower levels. Specifically, the creation of an additional outlet from the Brookings / White area, as discussed previously, alleviates constraints around Watertown, as well as alleviating substantial loading on the southwestern Minnesota 115 kV transmission network. The Brookings Project also prevents substantial 115 kV line overloads for the loss of one of the 345 kV lines into the Twin Cities of Minnesota by providing an additional inlet into this major load center.

Finally, the Brookings Project alleviates constraints along the Minnesota-Wisconsin interface through bringing an additional 345 kV transmission line into the area. Constraints on this interface were identified for the loss of a local 345 kV line, which would overload a transformer and several 115 kV transmission lines without the support provided by the Brookings Project. Constraints mitigated by Brookings that were unique to the summer peak analysis may be seen in Figure 2.4 below.



**Figure 2.4: Additional Summer Peak Overloads Mitigated by the Brookings Project**

Specifically, the Brookings Project mitigates approximately 180 different transmission outage conditions specific to the summer peak scenario which would otherwise result in heavily loaded or overloaded system elements. More information on individual constraints and loadings may be found in Appendix 4 to the Candidate MVP Interim Report.

Public Policy Evaluation

Through the mitigation of the violations described above, the Brookings Project enables approximately 2,049 MW of wind capacity to be delivered to load. This capacity is equal to approximately 15% of the state RPS energy requirement. Additional information on the specific generation units that would be curtailed without the Brookings Project is contained in Appendix 6 to the Candidate MVP Interim Report.

### 2.2.3 Underbuild Requirements

The system was analyzed for any violations that were caused or aggravated by the addition of the Brookings Project. Of these violations, five are in the vicinity of other Candidate MVP projects as shown below in Table 2.2, such as the Ellendale to Big Stone or the Lakefield to Mitchell County projects. They will be analyzed in the full portfolio analysis and are not recommended for additional mitigation at this time.

**Table 2.2: Brookings Project Underbuild Violations Near Other Candidate MVP Projects**

Element	Expected Mitigation
<b>Farmington to Castle Rock 69 kV</b>	Near Lakefield – Mitchell Co project Will be analyzed in full portfolio analysis
<b>Adams 345 / 161 kV transformer</b>	Near Lakefield – Mitchell Co project Will be analyzed in full portfolio analysis
<b>Ellendale 230 / 115 kV transformer</b>	Near Ellendale – Big Stone project Will be analyzed in full portfolio analysis
<b>Galesville to Tempealeau 69 kV</b>	Near North LaCrosse –Cardinal project Will be analyzed in full portfolio analysis
<b>Tunnel City Tap to Timeberwork 69 kV</b>	Near North LaCrosse –Cardinal project Will be analyzed in full portfolio analysis

The remaining constraints had the following mitigation. These upgrades will be incorporated into the design of the Brookings Project.

**Table 2.3: Other Constraints and Mitigation for Conditions Aggravated by the Brookings Project**

Constrained Element	Expected Mitigation
<b>Lake Marion 115 / 69 kV transformer</b>	Install a 69 kV tie line between existing Lake Marion substation and the new 345 / 115 kV substation (named Chub Lake). Replace the existing Lake Marion 69 / 115 kV transformer with a larger unit at Chub Lake.
<b>Burnsville to Lake Marion 115 kV line</b>	Upgrade the Chub Lake (formerly Lake Marion) to Burnsville 115 kV line.
<b>Lake Marion to Lake Marion tap 69 kV line</b>	Upgrade the Lake Marion – Lake Marion Tap 69 kV line
<b>Franklin 115 / 69 kV transformer</b>	Replace both existing Franklin transformer with larger units

### 2.2.4 Component Analysis

The Brookings Project has a number of different components, each of which has multiple benefits to the transmission system. To ensure that the entire project meets the MVP cost allocation criterion, each component was analyzed separately to demonstrate its value. It was determined that each project component, listed below, supports the MVP criterion, through enabling a more robust system, increasing system reliability, and/or reducing flows on neighboring transmission system.

- Lyon County 345/115 kV transformer
- Cedar Mountain 345/115 kV transformer and Cedar Mountain to Franklin 115 kV line
- Lake Marion 345/115 kV transformer
- Lyon County to Hazel 345 kV line, Hazel to Minnesota Valley 230 kV line, and Hazel 345/230 kV transformer
- Lyon County to Cedar Mount to Helena double circuit 345 kV line

More specifically, the removal of individual project components results in increasing loading on the 230 kV path from Minnesota Valley to Twin Cities, as well as on the existing 345 kV outlet from Brookings to White to Split Rock and Split Rock to Lakefield to Wilmarth to the Twin Cities. Of the overloaded facilities that the Brookings Project mitigates, approximately half the constraints re-appear as individual components are removed from the overall project. As a result, it was determined that the full Brookings Project, as originally submitted, meets the MVP criterion.

2.2.5 Sensitivities to other projects in portfolio

Sensitivities were run to show the linkages between the overall Candidate MVP Portfolio and the Brookings Project. These sensitivities and their conclusions are described below.

Ellendale – Big Stone – Brookings Sensitivity

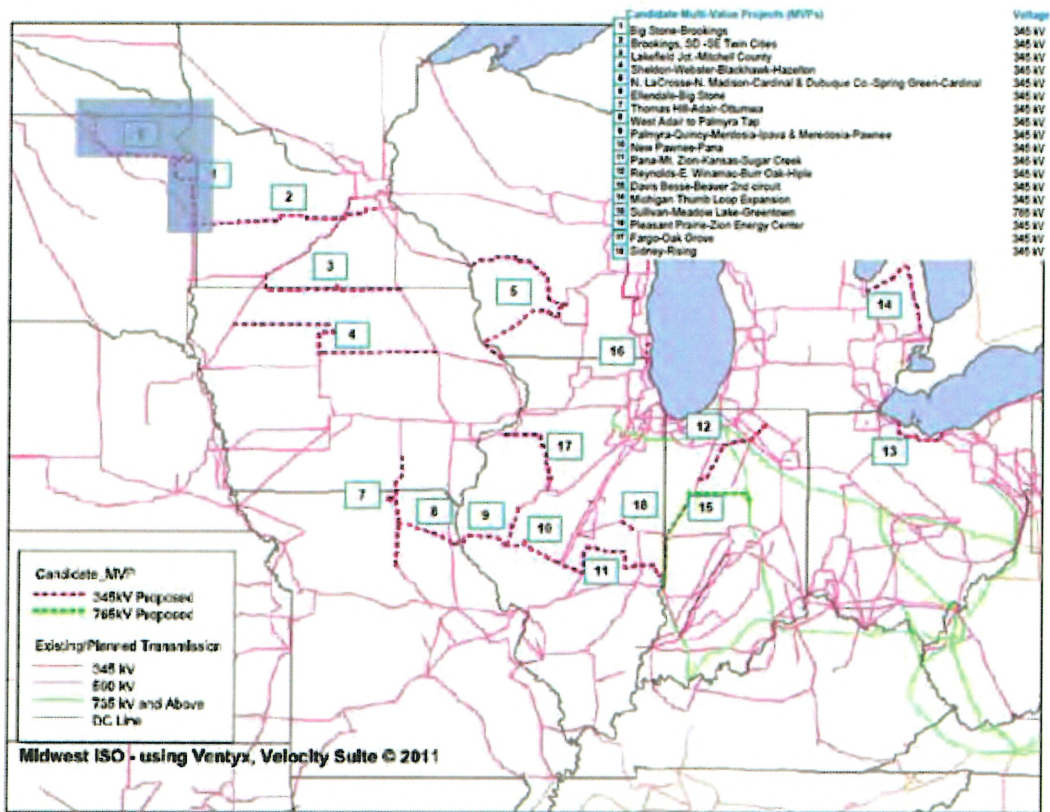


Figure 2.5: Ellendale to Big Stone and Big Stone to Brookings Projects

The purpose of this sensitivity was to determine if, with the expected increase in flows provided by the Candidate MVP projects from Ellendale to Big Stone and from Big Stone to Brookings, the Brookings Project is still adequately sized for the wind energy requirements described in the state RPS mandates. Although this analysis demonstrated that additional power did flow on the Brookings Project with the addition of the Ellendale to Big Stone and Big Stone to Brookings project, these flows did not require that the Brookings Project be increased in size.

An additional analysis was performed with the Ellendale to Big Stone, Big Stone to Brookings, and North LaCrosse to Madison projects in the model, to test the hypothesis that the North LaCrosse to Madison project would further increase the flows on the Brookings Project. Although this hypothesis was validated, the additional flows did not require that the Brookings Project be increased in size.

Iowa Projects Sensitivity

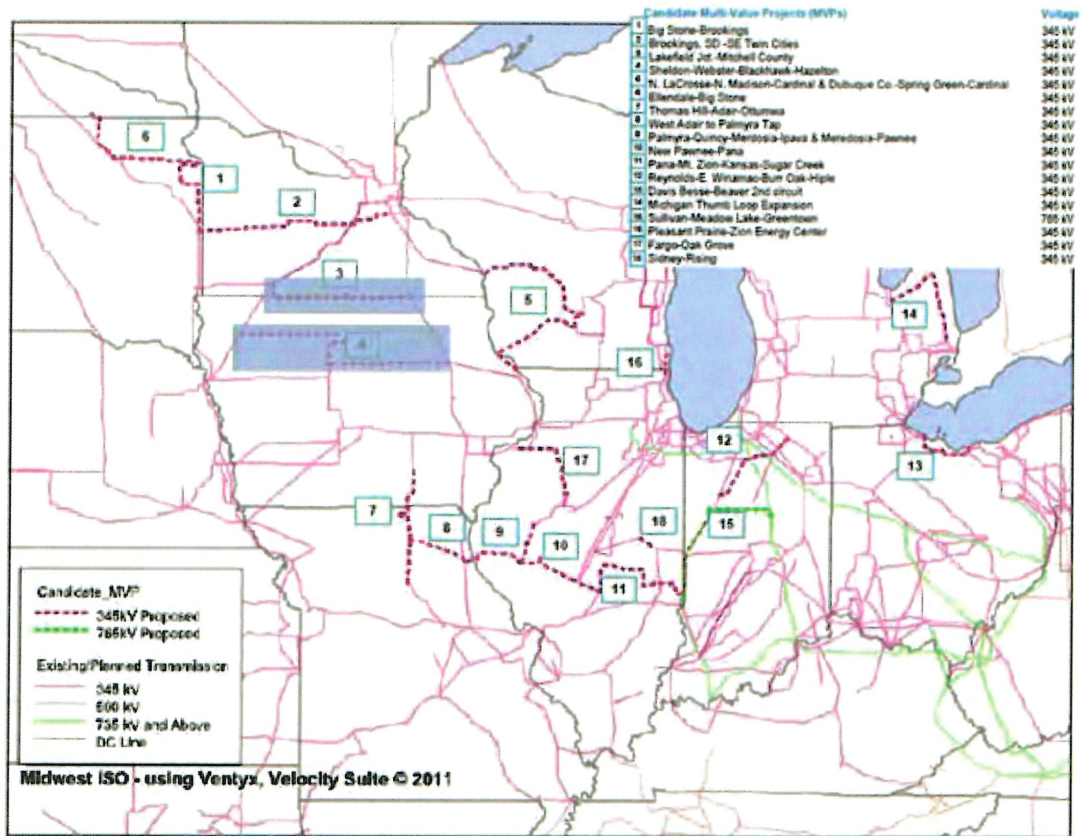


Figure 2.6: Iowa Projects

The Iowa projects sensitivity was performed to show any constraints that could be mitigated by the Lakefield-Mitchell Co or the Sheldon-Webster-Blackhawk-Hazelton projects in Iowa, in lieu of the Brookings Project. The intent of this analysis was to review if the Brookings Project could be replaced by one or both of the Iowa projects. Although some shared constraints were found, it was determined that the Brookings Project could not be replaced by a combination of Iowa projects; it largely mitigates constraints that could not be resolved by either the Lakefield-Mitchell Co or the Sheldon-Webster-Blackhawk-Hazelton projects.

North LaCrosse – Cardinal – Madison Sensitivity

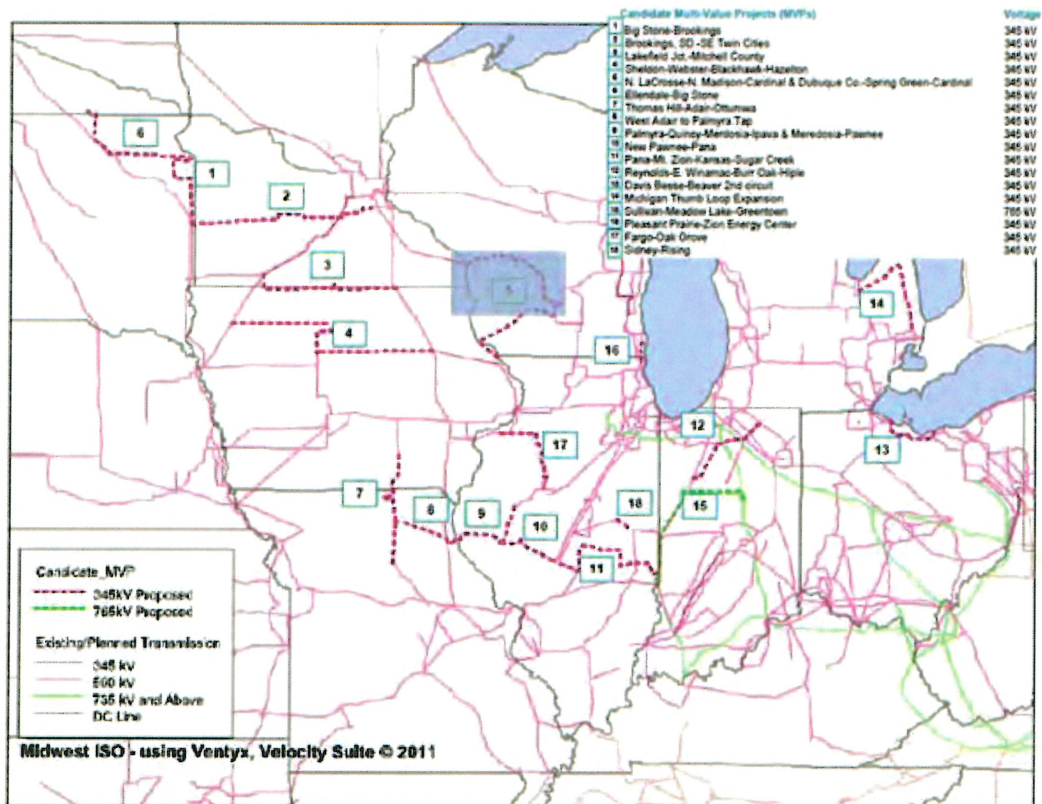


Figure 2.7: North LaCrosse – North Madison – Cardinal Project

Based on previous study work, it was suspected that the Brookings Project would cause additional flows in Wisconsin without the support of the North LaCrosse – North Madison – Cardinal project. A sensitivity was performed to document any increased flows, as well as the impact of the North LaCrosse – North Madison – Cardinal project in reducing them. This work is preliminary, and additional analyses will be done to show the full value of the North LaCrosse – North Madison – Cardinal project.

### 2.3 Candidate MVP Portfolio Overview

Although the previous section focused on the benefits of the Brookings Project on a relatively stand-alone basis, it should be stressed that the project is a piece of the 2011 Candidate MVP Portfolio. Analysis is ongoing on the full portfolio, and this analysis will be completed for a November or December project recommendation. This full Candidate MVP Portfolio is shown below in Figure 2.8.

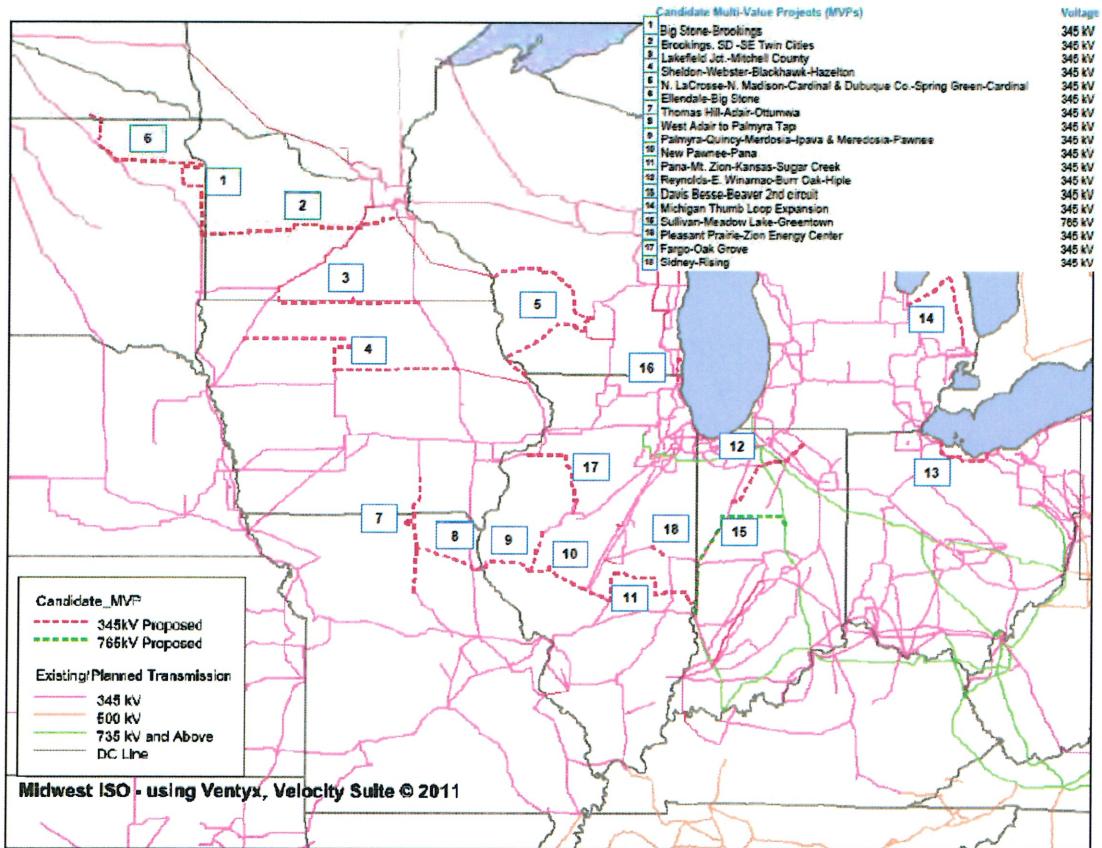


Figure 2.8: 2011 Candidate MVP Portfolio

### 2.3.1 Preliminary Portfolio Economic Value Quantification and Spread

Preliminary analysis was performed to quantify some of the benefits surrounding the full Candidate MVP Portfolio, as it is currently configured. Please note that these benefits will vary as further analysis may alter the composition of the project in the MVP Portfolio.

#### Adjusted Production Cost (APC) Benefits

The addition of transmission to the system allows for the more efficient dispatch of generation resources, opening up markets to competition and spreading the benefits of low-cost generation throughout the footprint. APC benefits reflect the savings achieved through the reduction of transmission congestion costs and through more efficient generation resource utilization.

In order to show the benefits of the portfolio under a variety of different potential policy based futures, a total of four sets of APC benefits were calculated. The futures that were analyzed were designed to 'bookend' the range of potential future policy outcomes, ensuring that all of the most likely future policy scenarios and their impacts were within the range bounded by the results. The futures analyzed are described below.

- **Business As Usual** assumes that current energy policies will be continued, with no large changes in current demand and energy growth projections.
- **Business As Usual with High Demand and Energy Growth** assumes that current energy policies will be continued, with increased demand and energy growth rates.
- **Carbon Constraint** assumes that current energy policies will be continued, with the addition of a carbon cap modeled on the Waxman-Markey bill.
- **Combined Energy Policy** assumes a myriad of energy policies are enacted, including a 20% federal RPS, a carbon cap modeled on the Waxman-Markey bill, the implementation of a smart grid, and the widespread adoption of electric vehicles.

When all futures were analyzed, the Candidate MVP Portfolio produced an estimated \$13.5 to \$33.4 billion in 20 year Net Present Value (NPV) Adjusted Production Cost benefits, depending on what future policies were considered in the analyses. These benefits result in a 20-year benefit-to-cost ratio of 1.12 to 2.77, assuming a total portfolio cost of \$5.2 billion.

An important component of the Candidate MVP Portfolio is its ability to produce widespread regional benefits. The spread of the APC benefits is shown below in Figure 2.9. The Candidate MVP Portfolio successfully spreads the benefits of low cost generation and reduced congestion across the MISO footprint, resulting in benefits for each subregion.

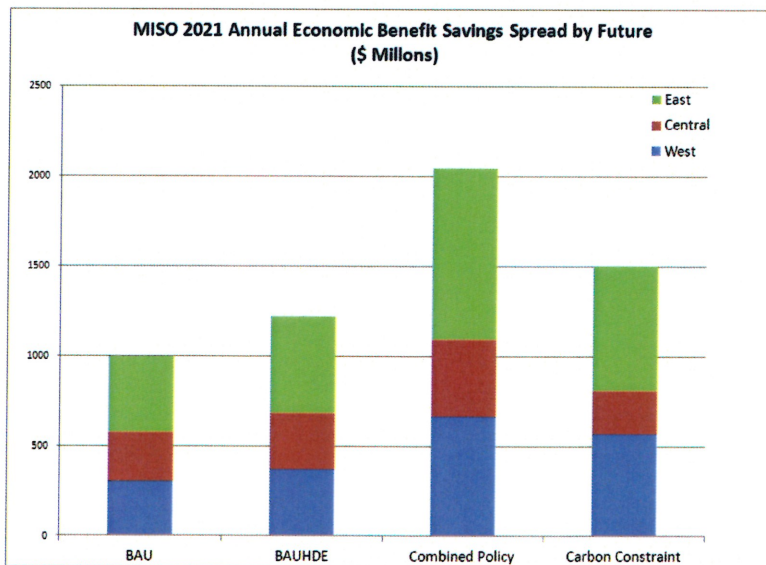
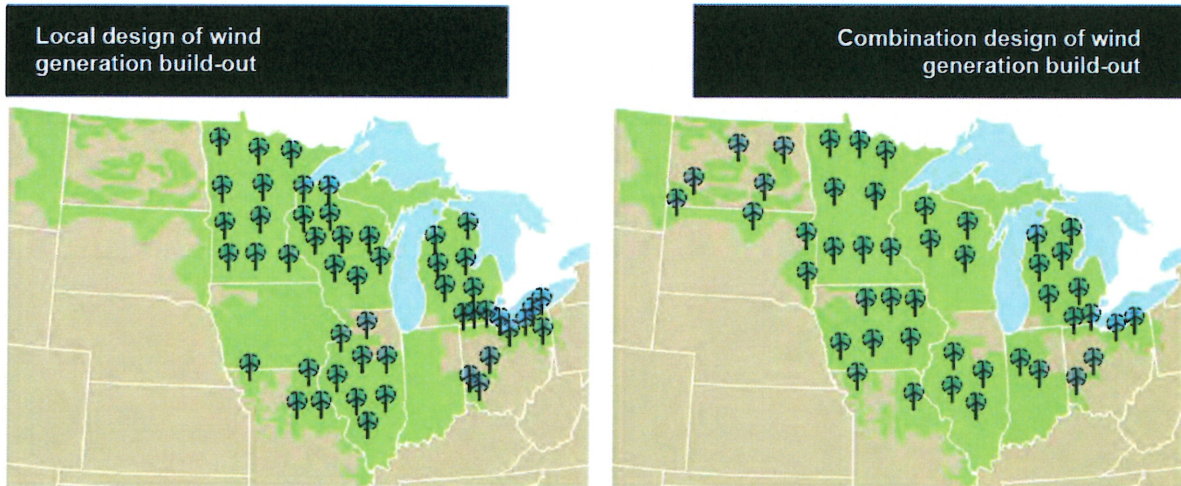


Figure 2.9: Candidate MVP Portfolio Preliminary Benefits Spread

### Capital benefits of wind siting

As discussed in section 2.2.2, the MISO determined that the least cost approach to generation wind siting, when both transmission and generation capital costs are considered, is to source generation in a combination fashion, where wind is located both local to load, where less transmission is required, and regionally, where the wind is the strongest. However, this strategy depends on a strong regional transmission system to deliver the wind energy from where it is sited to load centers. Without this regional transmission backbone, the wind generation would have to be sited locally to load, requiring the construction of significantly larger amounts of wind capacity.



**Figure 2.10: Local versus Combination Wind Siting**

As part of the MISO 2010 Value Proposition, it was determined that the annual benefit of this wind siting methodology was equal to between \$34 and \$42 million in 2010, with a 10-year NPV of \$1,043 to \$1,294 million<sup>4</sup>.

<sup>4</sup> Additional details on these analyses may be in the MISO corporate value proposition at the link below.  
<https://www.midwestiso.org/WhatWeDo/ValueProposition/Pages/ValueProposition.aspx>

### 2.3.2 Additional Project and Portfolio Benefits

The Candidate MVP Portfolio provides widespread benefits across the system. These benefits include the delivery of wind energy and the reliability benefits shown for the Brookings Project. They also include the APC and generation capital benefits quantified above. However, these metrics do not fully quantify the full benefits of the portfolio; some additional qualitative values are discussed below. These values support and inform the primary project justification. They also demonstrate the value of the portfolio in aggregate.

It should be noted that not all project and portfolio value can be quantified, and that not all the values below may demonstrate a strong benefit for each project in the 2011 Candidate MVP Portfolio. However, the Candidate MVP Portfolio study team will continue to explore methods to capture the full impact of the portfolio and its component transmission on the system.

#### Transmission loss reductions

In a future scenario where the installed generation capacity is only just sufficient to meet peak load need, a reduction in transmission losses can create benefits through reducing the amount of generation that must be built to serve peak load.

#### Planning Reserve Margin (PRM) reduction

In a scenario where the installed generation capacity is merely sufficient to meet the system's PRM, a reduction in the system's PRM reduces the amount of additional generation capacity which must be installed to maintain the Planning Reserve Margin. This benefit may also apply if zonal import or export constraints are relaxed through the installation of transmission.

#### Enabling Installed Generation Capacity Delivery

Existing generation capacity may be limited in its ability to acquire Network Resource (NR) status, and therefore may not be able to be used to meet Reserve Margin Requirements. The installation of additional transmission may allow additional generation to achieve NR status, delivering additional capacity value to the system.

#### Portfolio robustness

The ultimate goal of the MISO planning process is to develop a transmission system that will enable market efficiency and competitiveness while maintaining system reliability under any resource mix. This robustness reduces the investment risk for the portfolio, and it allows for flexibility under various future policy conditions.

#### Enabling Generation Interconnection Projects

Although Multi Value Projects are not Generator Interconnection projects, they serve to create a regional backbone which enables the installation of new generation into the MISO system. This removes the responsibility from the generators to build regional upgrades, allowing their upgrades to focus on more local interconnection issues. A list of the generation interconnection requests in the Definitive Planning Phase (DPP) or beyond that are impacted by the projects in the Candidate MVP Portfolio are included in Appendix 7 to the Candidate MVP Interim Report. Without the Candidate MVP Portfolio, these projects would either be responsible for funding the associated Candidate MVP project or funding a restudy to determine an alternative upgrade.

### 3 Conclusions and Recommendations

The MISO staff recommends the Brookings Project to the MISO Board of Directors for conditional approval in June of 2011. This recommendation is based upon the strong reliability benefits of the project, as described above, and its ability to enable large amounts of wind generation to be delivered to load. The project also functions as an effective part of the overall Candidate MVP Portfolio, which serves to improve the overall reliability of the transmission system while spreading the economic benefits of lower-cost generation throughout the footprint. The approval will be conditional upon the Board acceptance of the final 2011 Candidate MVP Portfolio study report.

## Appendix 2 Indicative MVP Usage Rate Estimates June 2011 MTEP Documentation

**Figure 1. *Indicative* Multi-Value Project (MVP) Schedule 26-A Annual Charges by MISO Local Balancing Authority (LBA) for Approved Appendix A MVPs**

*Values shown below (in 2011\$) are subject to change depending on actual withdrawals (MWh), actual project costs including Construction Work in Progress, actual In-service Dates, and actual Annual Charge Rates for Transmission Owners*

**Figure 1.1 Approved and Pending Approval Appendix A MVPs**

Project ID	Project Name	Transmission Owner(s)	Estimated In-Service Date	Estimated Project Cost	Approval Status
3168	Candidate MVP Portfolio 1 - Michigan Thumb	ITC	2013-2015	\$510,000,000	Approved MTEP 10
1203	Candidate MVP Portfolio 1 - Brookings, SD - SE Twin Cities 345 kV	XEL/GRE/OTP/MRES/CMMPA	5/1/2015	\$730,000,000	Pending Approval June 2011
Total				\$1,240,000,000	

**Figure 1.2 *Indicative* MVP Usage Rates for Approved and Pending Approval Appendix A MVPs**

Indicative MVP Usage Rate (\$/MWh)	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Michigan Thumb	\$0.00	\$0.00	\$0.08	\$0.16	\$0.23	\$0.23	\$0.22	\$0.22	\$0.21	\$0.20
Brooking, SD - SE Twin Cities 345 kV	\$0.00	\$0.00	\$0.00	\$0.00	\$0.24	\$0.24	\$0.23	\$0.23	\$0.22	\$0.22
Total Indicative MVP Usage Rate (\$/MWh)	\$0.00	\$0.00	\$0.08	\$0.16	\$0.48	\$0.47	\$0.45	\$0.44	\$0.43	\$0.42

**Notes:**

- 1) Indicative MVP Usage Rate based on the approved and pending approval Appendix A MVPs listed in Figure 1.1.
- 2) Annual MISO Withdrawals based on 2010 values with years 2011-2021 escalated assuming an annual energy growth rate of 0.79% consistent with the assumed energy growth rate used in the MTEP 11 Business as Usual Future, see tab "Indicative LBA Energy Values" for individual LBA values.
- 3) Annual Revenue Requirement calculated using an estimated Annual Charge Rate for each Transmission Owner based on the method detailed in Attachment MM. Annual Charge Rate estimated using Transmission Owner's Attachment O data as of January 2011 and assumes 40-year straight-line depreciation.
- 4) Construction Work in Progress charges are assumed to be zero.
- 5) For the Michigan Thumb MVP the project is assumed to be phased in equally over the 2013-2015 period.
- 6) The Indicative MVP Usage Rate for the Michigan Thumb reflects that load in First Energy are obligated for a portion of the Michigan Thumb project.

### Appendix 3 Straits Project Cost Allocation June 2011 MTEP Documentation

Appendix A-1: MTEP11 Appendix A Project Cost Allocations by Pricing Zone—Subject to Approval for Appendix A  
*Values shown below are subject to change depending on actual project costs*

Proj ID	Project Name	Project Type	Region	Estimated In-Service Date	Transmission Owner	Estimated Project Cost
2846	Straits Power Flow Control	BRP	West	Aug-14	ATC	\$90,000,000

Pricing Zone	Pricing Zone Allocation Percentage	Share of Estimated Project Cost
AMIL	0.861%	\$774,596
AMMO	0.213%	\$192,032
ATC	57.535%	\$51,781,116
CWLD		
CWLP		
DPC	0.287%	\$258,386
DUK	0.039%	\$35,292
GRE	0.003%	\$2,675
HE		
IPL		
ITC	0.461%	\$415,046
ITCM	0.881%	\$792,621
MDU		
MEC	0.215%	\$193,651
METC	38.135%	\$34,321,334
MP	0.144%	\$129,585
MPW		
NIPS	0.528%	\$474,883
NSP	0.694%	\$624,905
OTP	0.004%	\$3,879
SIPC		
SMMPA		
VECT		
<b>MISO Total</b>	<b>100.000%</b>	<b>\$90,000,000</b>

## Appendix 4 Eaton Rapids Load Interconnection Project June 2011 MTEP Documentation

### Appendix 4.1

## MISO Out of Cycle Project Review Request Form

### Introduction

The annual MTEP development cycle and process is intended to provide an orderly and efficient holistic, open, and transparent expansion planning process that establishes the transmission expansion needs for the MISO system. To the greatest extent possible, all newly proposed transmission expansions should be reviewed within that MTEP annual process in order to: 1) ensure that stakeholders have adequate information about and input to proposed expansions; 2) to ensure the most efficient coordination with projects proposed by others, and; 3) to adequately access and discuss with stakeholders cost allocations as provided for under the tariff. When it is not possible to include review of new proposals within that annual process without causing potential delay in implementing a necessary expansion, an Out-of-Cycle (OOC) project review may be required. The OOC project review allows for exceptions to the preferred MTEP program. The intended use of OOC project review is to enable Transmission Owners the ability to respond in a timely fashion to significant new load additions or other new system needs which require budgeting, regulatory milestones, construction, or other aspects of a project development to proceed prior to the next scheduled MTEP approval.

As FERC Order 890 requires an open and transparent planning process, stakeholders will be notified of the urgent project need and will have opportunity for input into the out-of-cycle review process. Additional details on the Out-of-Cycle review process are provided in Section 7.1 of the Transmission Planning Business Practices Manual.

In order to establish the need for and OOC project review, the following information must be provided by the entity requesting MISO review:

### Out-of-Cycle Project Review Request

*Please complete the following information:*

Transmission Owner's / Constructing Entity's Name	Michigan Electric Transmission Company, LLC (METC)
Date of this OOC Review Request	04/13/2011
Date New System Need was Identified	A formal load interconnection request was made by the City of Eaton Rapids to METC on October 25, 2010.
Project Name	Eaton Rapids Load Interconnection
Project Description	Build a new 4 breaker, 138kV URV Junction substation and loop in the Delhi-Tompkins #1 138 kV line. Consumers Energy will need to convey to METC an approximately 10 mile long 138 kV circuit between the Delhi-Tompkins line and the Eaton Rapids North substation. Terminate one end of the conveyed line at the new URV Junction substation. At the other end,

	<p>install a 2-way, full-load-break pole top switch at the tap point that will feed a proposed CE new 138/46kV transformer at the Eaton Rapids North substation (CE is evaluating the proposal to install this transformer).</p> <p>Construct a new 4 breaker, 138kV Clinton Junction substation and loop in the 138kV Island Road-Delhi circuit and the existing tap to Wolverine Power's Clinton substation. Rebuild approximately 10.6 miles of an existing Wolverine 69kV line between the Clinton Junction substation and the Wolverine Eaton Rapids station to single circuit 138 kV construction utilizing 954 ACSR. Install a 2-way, full-load-break pole top switch at the tap point that will feed Wolverine's new 138/12.47kV Eaton Rapids transformer (Wolverine is evaluating the proposal convert the line to 138kV and install this transformer).</p> <p>Where the two 138kV feeds meet near the Eaton Rapids North substation, build an additional 2 miles of double circuit steel poles between Eaton Rapids North and the new URV substation. String both sides with 954 ACSR to finish creating the new Clinton Junction-URV and URV Junction-URV 138kV lines. A one line diagram of this proposal can be found in Appendix C of the project justification document.</p>
<p>Required In Service Date of Project (ISD)</p>	<p>No later than 1/1/2013</p>
<p>Estimated Lead Time (Applicable Permitting &amp; Construction time) (P&amp;C)</p>	<p>2 miles of new right of way will be required as well as rebuilding 11 miles of existing 69kV circuit to 138kV. Three new switching stations are needed including 11 new 138kV circuit breakers. Design and ROW evaluation will need to commence ASAP in order to meet the 1/1/2013 deadline which is 18 months from the date of this request. Eaton Rapids has requested redundant service by September 2012 if possible due to the uncertainty of the ramp up of the load additions.</p>
<p>Requested MTEP OOC Approval Date (RAD)</p>	<p>June 16, 2011</p>
<p>Explanation of why an Out-of-Cycle review is being requested (Brief summary of system need and why completion of upgrade would be in jeopardy if project is approved by MISO at the next Scheduled MTEP BOD Approval Date (SAD) (MTEP 08 approval expected no later than December 31 2008)</p>	<p>The next MTEP cycle (2012) commences in September 2011. The first opportunity for BOD approval would be June 2012. This would leave only 6 months to design and build this project which is not feasible.</p>

Supporting Data

The Transmission Owner is responsible for submitting an out-of-cycle review report that documents the system need for a proposed project. The report must include a description of system conditions causing contingency criteria violations. The report should also detail any alternatives and the rationale for selecting this project over alternative projects. Please see Section 7.1 of Transmission Planning BPM for additional details. The Transmission Owner is responsible for submitting the project information to both MISO MTEP Project Database and Model on Demand model building tool.

The MISO planning staff will confirm receipt of the report and project data. Upon receipt of this request, report, and Project Database submittal; MISO will perform a cursory review of the submittal and, if necessary, request additional information. Please submit Out-of-Cycle Project Review requests to Director ([jwebb@midwestiso.org](mailto:jwebb@midwestiso.org)) and Manager ([ddebner@midwestiso.org](mailto:ddebner@midwestiso.org)) of Expansion Planning, preferably by electronic mail.

*Please Specify Status of Supporting Data Submitted to MISO*

Transmission Planning study	Owner	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	File name	
MISO Project Database submittal		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	File name	Project_Reporting_Forms_Eaton_Rapids_OOC.xlsx
Model On Demand project submitted		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Project name	Eaton Rapids Load Interconnection

## Appendix 4.2

### Project Justification Document

#### Eaton Rapids Load Interconnection

#### MISO Project ID: P3505

##### System Concerns

This interconnection project is an industrial load interconnection request from the City of Eaton Rapids to construct a new 138/12.47 kV substation in Eaton Rapids, MI to serve a new industrial customer (URV USA) with an anticipated 40 MW of total demand. Due to the need for an uninterrupted power supply and planned around the clock operation, the City of Eaton Rapids and URV USA have requested looped 138 kV service to their site by 1/1/2013 as the final configuration. See Appendix A for more information. As this project is strictly in response to a customer interconnection request, it is not being proposed to address any specific system reliability concerns.

##### Recommended Proposal and Reasoning

The recommended proposal for serving the new Eaton Rapids/URV load addition is Proposal 1. Under this proposal, one of the looped 138kV lines feeding URV comes from the east from a new METC switching station (tentatively called URV Junction) which would cut into the existing Delhi – Tompkins #1 138kV line. The second 138kV feed to URV comes from the west from a new METC switching station (tentatively called Clinton Junction) which would be constructed at the existing Clinton Tap location on the Island Road – Delhi 138kV line. Both of these feeds would meet together on the north side of Eaton Rapids and then be routed down to the URV substation located on the south side of Eaton Rapids on an approximately 2 mile long, double circuit tower. At the URV substation, METC would then own and install the high side of the substation which would consist of two 138kV buses with a section breaker and line breakers on the two incoming feeds.

The eastern feed from the URV Junction station would utilize a Consumers Energy (CE) 138kV line to be conveyed to METC that will be used to feed Phase 1 of the URV load addition until the looped configuration can be constructed. This line is currently operated at 46kV but is mostly prebuilt to 138kV and will be operated at 138kV by CE to feed Phase 1 of the URV load addition. As part of the Phase 1 project CE will rebuild approximately 2.4 miles of the circuit from the URV Junction site to the CE Balzer station. The western feed from the Clinton Junction station would involve rebuilding an existing 10.6 mile Wolverine Power Cooperative 69kV circuit into Eaton Rapids to single circuit 138kV. Wolverine would forego the 69kV Eaton Rapids line in favor of a new 138/12.47kV transformer in Eaton Rapids that would be tapped off the new METC Clinton Junction to URV line. This proposal is currently being reviewed by Wolverine staff and is awaiting their formal comment and approval.

Proposal 2 involves the same eastern feed from the new URV Junction station, the same 2 mile long double circuit tower from north Eaton Rapids to the URV substation, and the same high side METC facilities at the URV substation. The difference between the two proposals involves the second of the looped feeds to URV. Under Proposal 2, the second feed to URV also comes from the west but from the existing Consumers Energy Island Road 138kV substation which would need to be conveyed to METC. An existing 12.25 mile Consumers Energy 46kV line from Island Road to the Eaton Rapids North substation would be rebuilt to single circuit 138kV construction with the old 46kV line being under built on the new 138kV structures. The Island Road substation would also need to be expanded in order to install the new 138kV line terminal position.

Proposal 1 is the recommended option as it ended up being the least cost option and serves the purpose of providing a new connection to Wolverine at their Eaton Rapids station. The Proposal 2 estimate did

not include certain unknown costs such as the cost of the revised easement with Consumers Energy after the expansion, potential conveyance costs of the existing 138kV assets at Island Road, and the cost of anticipated Consumers Energy related upgrades required at Island Road. Neither estimate included the conveyance cost of the eastern 138kV circuit from CE as it has not yet been determined.

### Planning Criteria Violations and System Analysis

The new interconnection was studied using an internal 2012 METC summer peak model. No planning criteria violations were identified.

#### **Infrastructure Criteria Violations or System Issues**

N/A

#### **System Outages Causing Concerns**

N/A

#### **Long Term Vision and Benefits**

This option provides METC with increased operational flexibility in the area. It also creates another east to west path between Delhi-Tompkins and Delhi-Island Road. This will reduce the exposure to outages on both lines and strengthen the 138kV source into Delhi.

#### **Other Project Justification**

N/A

### Project Proposals

#### ***Proposal 1 (Recommended):***

Build a new 4 breaker, 138kV URV Junction substation and loop in the Delhi-Tompkins #1 138 kV line. Consumers Energy will need to convey to METC an approximately 10 mile long 138 kV circuit between the Delhi-Tompkins line and the Eaton Rapids North substation. Terminate one end of the conveyed line at the new URV Junction substation. At the other end, install a 2-way, full-load-break pole top switch at the tap point that will feed a proposed CE new 138/46kV transformer at the Eaton Rapids North substation (CE is evaluating the proposal to install this transformer).

Construct a new 4 breaker, 138kV Clinton Junction substation and loop in the 138kV Island Road-Delhi circuit and the existing tap to Wolverine Power's Clinton substation. Rebuild approximately 10.6 miles of an existing Wolverine 69kV line between the Clinton Junction substation and the Wolverine Eaton Rapids station to single circuit 138 kV construction utilizing 954 ACSR. Install a 2-way, full-load-break pole top switch at the tap point that will feed Wolverine's new 138/12.47kV Eaton Rapids transformer.

Where the two 138kV feeds meet near the Eaton Rapids North substation, build an additional 2 miles of double circuit steel poles between Eaton Rapids North and the new URV substation. String both sides with 954 ACSR to finish creating the new Clinton Junction-URV and URV Junction-URV 138kV lines. A one line diagram of this proposal can be found in Appendix C.

**Estimated Project Cost: \$28,500,000**

**Expected in Service Date: No later than 1/1/2013**

***Proposal 2 (Rejected):***

Build a new 4 breaker, 138kV URV Junction substation and loop in the Delhi-Tompkins #1 138 kV line. Consumers Energy will need to convey to METC an approximately 10 mile long 138 kV circuit between the Delhi-Tompkins line and the Eaton Rapids North substation. Terminate one end of the conveyed line at the new URV Junction substation. At the other end, install a 2-way, full-load-break pole top switch at the tap point that will feed a proposed CE new 138/46kV transformer at the Eaton Rapids North substation (CE is evaluating the proposal to install this transformer).

Extend the Island Road 138kV bus to accommodate a new line position and install a new 138kV line breaker with associated disconnects. Rebuild approximately 12.25 miles of an existing CE 46kV line between Island Road and Eaton Rapids North substation to single circuit 138kV construction utilizing 954 ACSR. Under build the old CE 46kV line on the new 138kV structures.

Where the two 138kV feeds meet near the Eaton Rapids North substation, build an additional 2 miles of double circuit steel poles between Eaton Rapids North and the new URV substation. String both sides with 954 ACSR to finish creating the new Island Road-URV and URV Junction-URV 138 kV lines.

**Estimated Project Cost: \$31,000,000**

**Expected in Service Date: No later than 1/1/2013**

**Planning Advisory Committee**  
**Summary of Review and Advice to Advisory Committee and Board of Directors**  
**MTEP June 2011 Documentation**  
**Comments as of May 17, 2011**  
**Responses as of May 23, 2011**

The Planning Advisory Committee, through its Sector representatives, has reviewed the draft MTEP June 2011 report and provides the following summary advice to the Advisory Committee and the MISO Board of Directors with respect to the following topical aspects of the MTEP report.

This document contains a summary of all the substantive comments received by the MISO, as well as the MISO responses to these comments. Respondents were given the option of providing no comment (via a series of checkbox options), voicing their approval of various components of the MTEP report, studies and processes (again, via checkboxes), and/or providing written comments. A total of five sets of mostly written comments were received. These comments generally addressed the following items:

- Brookings Project / Candidate MVP Portfolio Analysis, Review and Approval
- Straits Project Analysis, Review and Approval
- Eaton Rapids Analysis, Review and Approval
- Stakeholder Review
- Process Improvements
- Report Edits and Clarification

This summary includes substantive comments from the following stakeholders:

- American Transmission Company
- Consumers Energy Company
- The Federal Energy Program Staff of the Illinois Commerce Commission
- Wisconsin Public Service Corporation
- Wolverine Power Supply Cooperative, Inc.

In addition, editorial comments were received from stakeholders during the review process. These comments, where applicable, will be incorporated into the draft report which will be sent to the Board of Directors.

The following stakeholders sent editorial comments:

- American Transmission Company
- MidAmerican Energy Company
- CapX2020 / Great River Energy

## Brookings Project and Candidate MVP Portfolio

Question	Stakeholder	Comment
1: Study Process	Consumers Energy Company	<p><u>Brookings Line Project</u></p> <p>-Consumers Energy does not believe the study process for the Brookings line has been completed in a manner that shows the explicit benefits of the project. In the analysis performed to determine the economic benefits, the line was only included as part of the overall portfolio of Multi-Value Projects (MVP). Consumers Energy understands that MISO needs to look at the project within the scope of the entire portfolio to meet the FERC approved criterion; however, it would be beneficial to all MISO participants to understand the economic benefits of the Brookings Line by itself. When MISO performed the analysis for the Michigan Thumb MVP approved by the MISO Board in August 2010, MISO included an economic analysis that showed the benefits of only the Thumb line. MISO's current analysis may hide the potential that the Brookings Line has a negative economic impact to certain regions within MISO. Consumers Energy requests the approval of the Brookings Line be delayed until a specific economic analysis of the Brookings Line alone is completed and shared with stakeholders consistent with the precedent set with the Michigan Thumb MVP.</p>
4: Cost Allocation	Consumers Energy Company	<p><u>Brookings Line Project</u></p> <p>Without a specific evaluation of the benefits of this project outside of the project area, Consumers Energy does not support the MVP cost allocation</p> <p>This project was initially evaluated and proposed to be approved in MTEP07 under an "Other" cost allocation which would align cost with the parties requesting the project. The project was pulled from Appendix A approval in MTEP07 because agreement on cost allocation was not resolved by the requesting parties.</p> <p>In May of 2010, approval of the project was again placed on hold until after MISO filed for their MVP cost allocation.</p> <p>Since this project is being justified under Criterion 1 (to meet public policy initiatives), the project costs should be allocated to those entities benefiting from the project (i.e. utilizing the renewable energy credits (RECs) made available by the project). Michigan customers do not benefit from the RECs made available by this project since under Michigan law, RECs must come from Michigan resources.</p> <p>While there may be economic benefits from this project to parties in the immediate area of the project, Consumers Energy has not seen any study that this project will provide Michigan customers with any meaningful benefits.</p>
1: Study Process	Federal Energy Program Staff of the Illinois Commerce	<p>Comments on deficiencies of the study process are incorporated into the responses to Questions 3 and 4 below.</p>

Question	Stakeholder	Comment
	Commission	
3: New Appendix A Projects	Federal Energy Program Staff of the Illinois Commerce Commission	<p><u>Brookings-Twin City Project</u></p> <p>1. MISO still has not defined the concept of “portfolio” or explained how portfolio analysis and project analysis fit together. The draft MVP report states,</p> <p>“In order to provide widespread benefits commensurate with cost allocation, MISO seeks to develop portfolios of MVP projects that provide widespread benefits across the footprint. Projects selected as candidates for possible recommendation within the broader portfolio are then evaluated to establish the business case for the portfolio.” (Page 11).</p> <p>This is empty prattle without meaning. MISO has not provided evidence to support a conclusion that the Brookings Project is a beneficial project either alone or as part of an unidentified portfolio. Beyond that, MISO has not provided evidence that there is not a better Project or a better portfolio. Further still, MISO has not provided any evidence that expected zonal benefits from the Project are “commensurate” with expected zonal costs.</p> <p>...</p> <p>4. MISO’s asserted benefit/cost ratio for the so-called Candidate MVP Portfolio is barely above 1 on the low end of its range, which should give one pause in and of itself. Also, the B/C range provided does not seem to be on the candidate MVP portfolio, but on the set of transmission projects in the four scenarios in Figure 1.5</p>
4: Cost Allocation	Federal Energy Program Staff of the Illinois Commerce Commission	<p><u>Brookings-Twin Cities Project</u></p> <p>1. MISO asserts that the benefits of this Project are distributed “commensurate” with the cost allocation, but has not provided any zonal or locational data to support the assertion. Even the subregional information that is provided is not on the specific project but on the study scenarios.</p>
1: Study Process	Wisconsin Public Service Corporation	<ul style="list-style-type: none"> <li>• <b>Wisconsin Public Service Corporation (WPSC)</b> feels that the documentation presented so far lacks the ingredients that establish the <b>necessity</b> for the MVP Portfolio. No analyses results were shown to demonstrate what issues the MISO transmission system would have to face if the Portfolio is not built. Where would congestions be? When? To what degree? To what degree would curtailment of wind outputs be necessary? What amount of wind capacity would be needed to meet the RPS energy goals? Etc. These were the issues that prompted the previous RGOS and also this Candidate MVP Study, but the report does not seem to address them.</li> <li>• The study has not demonstrated that the Portfolio is the <b>preferred</b> solution to the transmission problems that would ensue if the RPS were to be met. No alternatives have been presented and studied. For</li> </ul>

Question	Stakeholder	Comment
		investment of this magnitude, stakeholders deserve to be convinced of the comfort that other options have been studied, and that the proposed solution is the "preferred" one.
3: New Appendix A Projects	Wisconsin Public Service Corporation	<p><b><u>Brookings County –Twin Cities 345 kV Project</u></b></p> <p><b>Wisconsin Public service Corporation (WPSC)</b> recommends detailed analyses to be completed by taking a comprehensive look at the various candidate 345kV MVPs listed in the 2011 candidate MVP portfolio. Just by looking at the Brookings –Twin Cities 345kV line without a detailed evaluation of the effects of other 345kV segments such as Big stone-Brookings and Ellendale –Brookings does not give a true picture of the impacts and benefits of the various candidate MVPs. On the other hand, the narrow evaluation of only the Brookings-Twin cities 345 kV line might very well distort the true impacts and benefits of that line. Bulk transmission system is an interconnected system and as such the key elements of the interconnection should be evaluated for their impacts.</p> <p>In addition, it is our understanding that only the production cost savings provided by the Brookings –Twin cities line is taken into account in the computation of the benefits to cost ratio for the purposes of justifying this line as an MVP. If so, how could one conclude that the production costs savings were solely due to this line with the exclusion of the benefits provided by other lines?</p>

**MISO Response:**

A Multi Value Project (MVP), as defined in Attachment FF of the MISO Tariff, is one or more network upgrades that address a common set of transmission issues and meet one of the MVP criterion. These criterion require the project to enable public policy, enhance system reliability, and/or improve the economics of the transmission system. Also, per the Tariff criterion, a MVP must be evaluated as part of a Portfolio of projects, whose benefits are spread broadly across the footprint. The Tariff further defines a Portfolio as a collection of two or more MVPs proposed to be located in one or more Transmission Pricing zones that, when evaluated together, are expected to result in regional benefits.

The Brookings County to Twin Cities 345 kV project (Brookings Project) is being recommended for conditional approval as a part of a broader system portfolio of transmission expansion projects that form an MVP portfolio. The Brookings Project has been a part of the MISO study process since MTEP06. Prior to then, it was studied as part of the stakeholder CapX 2020 study effort. MISO also performed comprehensive analysis on the Brookings Project as part of the 2011 Candidate MVP Portfolio Analysis, using the same general study process and criteria that were used to analyze the Michigan Thumb Loop project as part of the same portfolio.

It was determined that the Brookings Project clearly meets MVP criterion 1, which requires transmission to reliably enable the delivery of energy in support of public policy, such as renewable energy mandates. More specifically, the Brookings Project mitigates 3,584 different outage conditions which could otherwise result in reliability violations. Through the mitigation of these violations, the Brookings Project enables approximately 2,050 MW of nameplate capacity wind to be delivered to load.

In addition, a number of sensitivities were performed to ensure that the value of the Brookings Project would not be impacted by other projects in the Candidate MVP Portfolio. These sensitivities included analyses with the Ellendale to Big Stone and Big Stone to Brookings projects, analyses with the two Iowa

projects, and analyses with the North LaCrosse – North Madison – Cardinal project. These sensitivities demonstrated that:

- The Brookings Project is correctly sized, when considered in the context of the rest of the Candidate MVP Portfolio
- The Brookings Project mitigates a set of constraints that could not be mitigated by other projects in the Candidate MVP Portfolio

Although the Brookings Project is justified based on the benefits discussed previously, the project is a part of the 2011 Candidate MVP Portfolio which, as a whole, provides distributed economic benefits to the MISO footprint. To demonstrate these benefits, the Adjusted Production Cost (APC) benefits of the Candidate Portfolio were calculated in each of the MISO future policy scenarios. These benefits show that, although the Portfolio is primarily designed to support the renewable portfolio mandates of the MISO states, it also creates widespread economic benefits across the MISO footprint. This spread of benefits justifies the MVP cost allocation of the Brookings Project, like the Michigan Thumb project before it, as part of the full 2011 MVP portfolio.

It should be noted that the Benefit / Cost (B/C) ratio calculated in the report only includes the APC benefits of the portfolio. As such, it represents a minimum value, and it is expected to rise as additional portfolio benefits are defined and quantified. It also should be noted that additional analysis is ongoing to optimize the remainder of the Candidate MVP Portfolio. This work will enhance the portfolio's value and is expected to drive further increases in the B/C ratio.

The final portion of the Candidate MVP Portfolio is currently being analyzed, and additional information supporting the necessity of the portfolio will be defined as part of this analysis. The remainder of the Candidate MVP Portfolio is expected to be recommended for approval at the November or December 2011 MISO Board of Directors meeting after the completion of the business case for the remaining projects in the portfolio.

Question	Stakeholder	Comment
3: New Appendix A Projects	Federal Energy Program Staff of the Illinois Commerce Commission	5. It is not clear that consideration of the Brookings Project by the MISO Board of Directors in June, rather than in December as would normally be the case, is necessary. Project timing should be driven by real system needs and not arbitrary political objectives. The timing of MISO's review in this case seems to be driven by expectations of a single State Commission's findings and MISO's Report does not provide any information that an analyst could use to confirm the target in-service date

**MISO Response:**

Although ideally all the projects in the final 2011 MVP Portfolio would be approved at the same time, in certain instances, it is neither feasible nor desirable to wait. For example, the Michigan Thumb Loop project, which is a component of the final 2011 MVP Portfolio, was approved in August of 2010 due to construction and RPS timelines. Likewise, the Brookings Project requires an approval prior to the remainder of the portfolio based on regulatory risks, potential cost penalties, and construction timelines.

The Brookings Project has achieved all of its regulatory approvals barring one at the present time, and it is expected to achieve its last regulatory approval in June 2011. These approvals are premised upon a 2015 in-service date, and right-of-way acquisition must start in the fall of 2011 to enable this in-service date. Similarly, a delayed project approval could drive an additional \$15 million in project costs, due to material supply and construction schedule modifications. Finally, the business case for the Brookings Project has been completed, and the project has been fully justified.

Question	Stakeholder	Comment
3: New Appendix A Projects	Federal Energy Program Staff of the Illinois Commerce Commission	<p>2. The Report does not address potential Brookings Project cost over-runs and the effects over-runs would have on the overall benefit/cost ratio or the zonal benefit/cost ratios.</p> <p>3. In PJM, the reduction in load forecasts caused by the recession has severely affected transmission project analyses and conclusions about the timing or even the worthiness of various projects. How sensitive is MISO's Brookings Project conclusions to study variables and which variables are most important?</p>
1: Study Process	Wisconsin Public Service Corporation	<ul style="list-style-type: none"> <li>Robustness of the Portfolio benefits, both economical or reliability related, has not been demonstrated. At this point we do not know how these benefits would survive variances in economic parameters or variances in location of the wind facilities. Stakeholders should be informed of the risk exposure to funding projects that may not end up being supported by the anticipated amount of facilities as presently conceived.</li> </ul>

**MISO Response:**

The risk associated with the changes in policy objectives and load growth are captured for the entire Candidate MVP Portfolio as a part of the futures analysis, and the related Adjusted Production Cost (APC) results demonstrate the benefits of this portfolio under variations in policy and load growth. The future scenarios included Renewable Portfolio Standards (RPS) that were adjusted for load growth, based on the assumptions in each future scenario.

This risk, in the case of construction costs, is managed by the constructing Transmission Owner. These risks are minimized by the June conditional approval of the Brookings Project, as the Transmission Owners will be able to take advantage of synergies with their other construction projects to minimize the project's costs.

Question	Stakeholder	Comment
4: Cost Allocation	Federal Energy Program Staff of the Illinois Commerce Commission	<p>2. On page 26 of the MVP Report, MISO states that, "Although Multi Value Projects are not Generator Interconnection projects, they serve to create a regional backbone which enables the installation of new generation into the MISO system." This statement recognizes that MVPs enable generators to interconnect to the network. To the extent that MVPs enable generators that otherwise would have had to fund expensive network upgrades to interconnect to the network effectively for free, MISO is creating a distortionary subsidy</p>

**MISO Response:**

The Candidate MVP Portfolio analysis included additional renewable generation to meet the RPS mandates of the MISO states. This included both planned generation with currently signed Generator Interconnection Agreements (GIAs) and existing generation. It also included an incremental amount of wind that would have to be added to the system to meet the needs of the RPS mandates. No Generator

Interconnection requests without signed GIAs were included in the model. The Candidate MVP Portfolio analysis will not remove the need for any generator interconnection requests to be studied, or for the generators to perform the Generator Interconnection upgrades, as determined necessary in these studies.

Question	Stakeholder	Comment
1: Study Process	Wisconsin Public Service Corporation	<ul style="list-style-type: none"> <li>On page 5 under Executive Summary, and again on Page 24 in the text, the bar-chart is presented showing the dollar amount, as well as the distribution by sub-region, of economic benefits. It is suggested that External RTO (PJM, SPP, TVA, etc.) benefits be also super-imposed onto this bar chart. Even though approval for the Portfolio to proceed need not hinge on whether external RTO would participate, stakeholders are still interested to know the full benefits of the investments and how these are distributed, intra- as well as extra-MISO.</li> </ul>

**MISO Response:**

This information will be calculated for the final portfolio, and the results will be considered for inclusion in the final Candidate MVP Portfolio report.

Question	Stakeholder	Comment
1: Study Process	American Transmission Company	In regards to the documentation of the interim report for the Candidate MVP Portfolio Analysis, ATC is supportive of where the report is at this stage of the analysis. As MISO completes the CMVP analysis and develops the business case for the remainder of the portfolio, ATC believes that there may be opportunities to further describe additional relevant information regarding the portfolio, such as discussing more in the report the efforts that contributed to the identification of this portfolio (e.g., the Upper Midwest Transmission Development Initiative, the Regional Generation Outlet Study, the Cross Border Top Congested Flowgate Study, and the Michigan Wind Energy Resource Zone Board).

**MISO Response:**

MISO will work with stakeholders to better document both the MISO and stakeholder related efforts that lead to the creation of the portfolio and the definition of its projects. This documentation will be captured in the final Candidate MVP executive summary and report.

## Straits Project Justification

Question	Stakeholder	Comment
1: Study Process	Consumers Energy Company	<p>A power flow control or phase shifter was reported under consideration in ATC's 2011 Ten Year Plan, September 2010, as needing further study and ongoing. MISO Staff reported results of their independent analysis of a phase shifter as a potential alternative in 2011, further review by ATC being necessary. ATC reported study results with additional comments on the MISO phase shifter potential alternative in a presentation to stakeholders in April 2011. The April 2011 evaluation did not include a N-1 planning study using the proposed flow control project in the power flow models. Planning and contingency settings of a flow control project need to be evaluated in power flow studies.</p> <p>Stakeholders have not been provided sufficient time to evaluate the April 2011 presentation of the flow control project.</p> <p>There are a number of additional studies that need to be evaluated, including: 1) the impact on stability of maintaining a closed 69 kV path between Wisconsin and the UP East using a Lake Michigan Loop Flow controller, since there are known stability problems in the Presque Isle area of the UP West; 2) the operation of generator voltage regulators in the automatic mode, rather than in the manual setting as currently practiced, in the Upper Peninsula should be studied, including power flow models and PV analysis corrected to represent the actual practice. Generator owners should be notified to properly maintain automatic voltage regulators and a voltage/reactive schedules established.</p>
1: Study Process	Wolverine Power Supply Cooperative, Inc	- Analysis on Project 2846 was performed using summer cases where the real time conditions provided are applicable to a winter case. Summer and winter cases differ in facility ratings, loads, and generation dispatch. Violations shown in the summer case should be verified to exist in the winter case.
1: Study Process	Wisconsin Public Service Corporation	It is urged that MISO must not forget to include the results and performance comparison of "Alternative Solution" that has been considered in lieu of this proposed project. It is necessary for report of this type to establish the "superiority" of the proposed project before seeking Board approval.
3: New Appendix A Projects	Wolverine Power Supply Cooperative, Inc	<p>Wolverine Power Supply Cooperative, Inc provides the following comments with regards to Project 2846 (ATC Straits Project).</p> <p>With regards to the May 17th, 2011 Michigan Technical Study Task Force meeting, questions regarding the operation of the AC-DC-AC converter with respect to the market conditions versus the reliability conditions, which were not fully resolved.</p>

### MISO Response:

The MISO recommended Straits Power Flow Control project is a VSC (voltage source converter) HVDC flow control at Straits. The addition of this control technology to the grid would not only help enable the transmission system in the Upper Peninsula to be closed, thereby reducing exposure to loss of load, it

would also improve the system stability. Modern VSC HVDC technology, unlike line commutated converter (LCC) HVDC technology, provides dynamic reactive power (much like a static VAR compensator) to improve system voltages and can be tuned to improve system damping during system swings.

Given that the technically superior VSC controller is completely effective in controlling flows to relieve constraints, the Straits Project justification completed on May 17<sup>th</sup> essentially relied on demonstrating the ineffectiveness of other alternatives to do the same. The main alternative tested were two Phase Angle Regulators (PARs) installed in series with each of the two cables connecting the Upper and Lower Peninsulas of Michigan. This alternative was only partially effective. When compared against real time system representation, it failed to relieve constraints for contingent events on the system. In summary, the installation of PARs would be ineffective for certain system conditions which if they occurred in real time would require operators to once again open the transmission network in Upper Peninsula.

With regards to the project's impact on stability, ATC, Black & Veatch and Electranix have studied the stability impacts of VSC (voltage source converter) HVDC flow control at Straits using a generic model. Final stability studies will be undertaken after the design of the VSC controllers has been fine tuned to optimize system stability. The studies completed so far with a generic VSC modeled have shown acceptable system stability with the project in service. Transient stability analysis indicates that under certain line faults, VSC power flow will have to be adjusted. These adjustments cannot be fully determined until studies using the final VSC design are completed, but preliminary analysis shows that these requirements are well within the capabilities of existing VSC technology.

With regards to Generator Automatic Voltage Regulators, generators close to Straits, US Hydro and Portage in Sault Ste. Marie MI, have been modeled with their AVR's (automatic voltage regulators), as they are normally run. The VSC HVDC technology can supply dynamic VARs that will improve the voltage in the eastern UP and reduce the reliance on generator AVR's to maintain acceptable system voltages. The final number of dynamic VARs available from the VSC is anticipated to be approximately half MW rating of the device. Also, the rate that the VSC device can supply these VARs should compare favorably with the rate VARs are supplied by generators.

The VSC controller does impact downstate METC projects that are being studied in MTEP11. In order to study these projects, MISO staff has defined the west-to-east and east-to-west flow limits across the Straits cables which can be controlled after the VSC is installed. Impact of a conservative limit of 40 MW in the west-to-east flow expected to be the dominant direction through the Straits on the METC projects was presented to stakeholders at the May 17th Michigan Technical Studies Task For (MI-TSTF) meeting. An east-to-west flow limit of 125 MW was also defined, but this limit is only expected to be reached during summer peak conditions. It will not impact the MTEP11 METC projects currently being proposed for 2011 approval.

Question	Stakeholder	Comment
2: Review Process	Consumers Energy Company	<p><u>Straits Power Flow Control Project</u></p> <p>Results of power flow studies and models used to justify the project were not available in a timely manner. Planning and contingency settings of the flow control project need to be evaluated using the N-1 criteria in power flow studies. A thirty day window between the April 2011 presentation of partial study results and request for approval is not sufficient.</p>
1: Study Process	Wisconsin Public Service Corporation	<ul style="list-style-type: none"> <li>The Straits Power Flow Control report is at this stage too sketchy for stakeholders to meaningfully comment and provide inputs. MISO is undoubtedly still working on the report.</li> </ul>
5: Report Content	Consumers Energy Company	<p><u>Straits Power Flow Control Project</u></p> <p>The documentation, additional study of alternatives, and presentations by the MISO staff were helpful in understanding the loop flow and voltage problems associated with the local flow and voltages issues in the Upper Peninsula.</p> <p>A presentation of partial study results for the project was presented to stakeholders at the April 2011 Michigan Technical Task Force meeting, so there has not been sufficient time to perform a thorough evaluation.</p>
1: Study Process	Wolverine Power Supply Cooperative, Inc	<p>- For projects up for the June Approval, there are some projects that could and have been shown to have more than a technical mitigation in that they could impact market issues with one being changes to LMP. For these types of projects the study period from December to June is too short. There was little time left between the final analysis, the stakeholder meetings, and the PAC/SPC BOD meetings before the June BOD Approval.</p>

**MISO Response:**

The Straits Project justification was completed on May 17<sup>th</sup>. Throughout the process, stakeholders were kept abreast of the analyses results on a monthly basis at various Sub Regional Planning Meetings (SPMs) and Technical Study Task Force Meetings (TSTFs). Additional analyses were performed due to stakeholder feedback at these meetings, and the results were subsequently presented at these meetings. The Straits project, and the issues it resolves, was first presented at the MTEP10 East and West SPMs in June 2010. Overall, the justification and analytical results for this project have been vetted with stakeholders at 6 SPMs and 6 TSTFs.

Question	Stakeholder	Comment
4: Cost Allocation	Consumers Energy Company	<p><u>Straits Power Flow Control Project</u></p> <p>While a potential cost allocation was presented in a draft form visually to stakeholders at the April 2011 Michigan Technical Task Force meeting, a proposed cost allocation has not been published or distributed for review.</p> <p>Due to the unique characteristics of this project, Consumers Energy does not support utilizing the traditional Line Outage Distribution Factor (LODF) methodology. A logical and firm cost allocation recommendation needs to be vetted with stakeholders prior to approval by the MISO Board.</p>
4: Cost Allocation	American Transmission Company	<p>ATC believes that MISO has assigned the appropriate method of cost allocation to each of the projects pursuant to the current FERC-approved tariff. Particularly in regards to the Straits Power Flow Control Project, ATC agrees with MISO that this is a Baseline Reliability Project under RECB I. As has been pointed out throughout the MISO stakeholder process that began at the Sub-regional Planning Meeting in June of 2010, the Straits Power Flow Control project is needed to manage heavy system flows without routinely needing to rely on opening the tie line at Hiawatha and splitting the Upper Peninsula.</p>

**MISO Response:**

The cost allocation of this 138 kV baseline reliability project using a Line Outage Distribution Factor (LODF) is consistent with MISO tariff (Attachment FF Section III.A.2.c.-Designation of Cost Responsibility for MTEP Projects). The cost allocation calculations rely on line mileage data which has been updated through a Transmission Owner data request. The final cost allocation for the Straits project will be presented at the May 25<sup>th</sup> Planning Advisory Committee (PAC) meeting.

Question	Stakeholder	Comment
1: Study Process	Consumers Energy Company	<p><u>Straits Power Flow Control Project</u></p> <p>Consumers Energy does not support approval of the project at this time due to the fact that the documentation for justification of the project is not complete.</p> <p>The market impacts have not been studied for the condition of closing the 69 kV path between Wisconsin and the Michigan UP East while controlling the resulting Lake Michigan Loop Flow using the proposed flow control device at the Straits substation in the UP. The local and market related congestion costs have been reported as high as \$2000 / MW during the brief period the through path has been closed. Clearly, the real time control of any Lake Michigan Loop Flow controller must be under the real time control of MISO and included in the MISO market dispatch strategy. The MISO staff has not investigated the market impact costs of a Lake Michigan Loop Flow controller or proposed any market operating strategies.</p> <p>...</p> <p>Prior to approval, MISO operating protocols for the flow control device need to be developed and studied for the impact on the energy market in the upper and lower peninsulas of Michigan. The impact on transmission projects in the lower peninsula needs to be identified to assure that there are no adverse impacts on the METC or Wolverine transmission systems. Consumers Energy requests the above studies be completed, and the project scope and parameters be adjusted as necessary prior to project approval by the MISO Board. The project can be reconsidered for approval during the regular MTEP11 approval cycle.</p>
3: New Appendix A Projects	Consumers Energy Company	<p><u>Straits Power Flow Control Project</u></p> <p>Consumers Energy recommends the above studies be completed, the project scope and parameters be adjusted as necessary and the project be reconsidered for approval during the regular MTEP11 approval cycle.</p>
5: Report Content	Consumers Energy Company	<p>A determination as to how the flow control devices will be operated has yet to be decided. A power flow study is then needed to determine the market impacts, Day-Ahead dispatch, and N-1 analysis using the flow control device planned and contingency settings. Consumers Energy would like the approval of this project delayed until we fully understand how the operation of these facilities will impact the markets. MISO should perform a market study which accounts for the operation of these flow control devices</p>

**MISO Response:**

MISO understands that the congestion on this interface is so large that re-dispatch around the limits is infeasible, compelling operators to open the transmission network in Upper Peninsula (UP). This forces the Eastern UP to rely upon the Lower Michigan transmission network for its power supply. It also creates difficulties when taking out transmission for maintenance to avoid potential load shed in Upper Peninsula of Michigan. The installation of the VSC controller would significantly minimize the above current practice of opening the UP transmission network, and as a consequence impact the market.

The Straits project will be under MISO functional control. It is expected to be operated in real time in fixed flow mode and only adjusted to alleviate constraints on the system driven by load, dispatch changes and transmission outages. The VSC controller, by definition, would limit flows resulting from Day Ahead schedules through the Upper Peninsula to ensure the transmission network can be operated to reliably serve load. MISO will develop the VSC controller operating guide with adjacent Reliability Coordinators over the next few years.

To specifically address concerns on how the VSC controllers are envisioned to be operated when they are installed in three years, a conference call has been arranged between MISO operations and the Michigan stakeholders. Outside of this, MISO does not believe that studying the project's impacts on the market is within the scope of this study, as market impacts should not prevent the approval of a project which is required to operate the transmission system reliably and reduce exposure to loss of load.

The project's final justification report has been posted on the MTEP ftp site. This justification is centered on its ability to trap through flows in Upper Peninsula, which presently compels the transmission network to be opened, leaving load at risk. The current inability to take Lower Peninsula transmission out of maintenance further aggravates the risk of forced transmission outages, increasing the risk of load shed. The business case for this project is complete, as it was demonstrated the VSC controller was effective in enabling the transmission system to be closed and controlling through flows, in contrast with the project's alternatives. The project has been vetted with stakeholders at numerous public and technical forums, and it is ready for approval, consistent with the mid-cycle MTEP review process.

## Eaton Rapids Project

Question	Stakeholder	Comment
1: Study Process	Wisconsin Public Service Corporation	<ul style="list-style-type: none"> <li>We have no comment on the Eaton Rapids Load Interconnection Project.</li> </ul>
2: Review Process	Consumers Energy Company	<p><u>Michigan Out-of-Cycle Eaton Rapids Load Serving Project</u></p> <p>Consumers Energy is supportive of this project and has been involved in the review process. The development of new load in this area will require additional facilities in order to supply the requested load. Consumers Energy will continue to work with METC and Eaton Rapids to monitor the status and timing of the load development supporting the overall project.</p>
2: Review Process	Wolverine Power Supply Cooperative, Inc	<p>Wolverine Power Supply Cooperative, Inc provides the following comments with regards to Project 3505 (Eaton Rapids Load Interconnection).</p> <p>The review process followed for the Eaton Rapids Load Interconnection project has worked well and leads to the proposal of a well configured project, which provides benefits for several utilities.</p>
3: New Appendix A Projects	Wolverine Power Supply Cooperative, Inc	<p>Wolverine Power Supply Cooperative, Inc provides the following comment with regards to Project 3505 (Eaton Rapids Load Interconnection).</p> <p>The proposal of the Eaton Rapids Load Interconnection project is a good thing for Michigan and the proposed configuration benefits several utilities.</p>

### MISO Response:

MISO appreciates the comments.

Question	Stakeholder	Comment
4: Cost Allocation	Wolverine Power Supply Cooperative, Inc	<p>Wolverine Power Supply Cooperative, Inc provides the following comment with regards to Project 3505 (Eaton Rapids Load Interconnection).</p> <p>The cost allocation of this project was never discussed during the stakeholder meetings. It is unclear who will be responsible for the transmission infrastructure required to connect the new Eaton Rapids load. Being that the interconnect is for a new customer where no infrastructure exists, it would be expected that the customer would be responsible for the cost of connecting their facility and the new customer has requested a redundant circuit. New load can always be connected by a single circuit, however this customer had requested a dual circuit for redundancy.</p>

**MISO Response:**

This MTEP project is categorized as “Other-Distribution”. It is not being recommended by MISO as a BRP (baseline reliability project) because no specific NERC planning criteria violations were identified on the transmission system with addition of this 40 MW load.

It is ITC Holding’s policy to review the requests of all network customers who ask for redundant service to determine if their processes require such service. In this case, the network customer’s processes warranted looped transmission service. Since these are network facilities, their costs are included in the network facilities costs and therefore are not allocated to any one customer. Other recent network customer loads that have warranted looped service within ITC Holding’s footprint in Michigan, not directly assigned to the customer and included within MTEP as “Other” or “Baseline Reliability” projects as applicable are-Baraga (Project ID1421- “Other”) and Midland (Project ID1817- “BRP”), Axle (Project ID1661- “Other”) and Horn (Project ID1660- “Other”).

## Stakeholder Review

Question	Stakeholder	Comment
1: Study Process	Wolverine Power Supply Cooperative, Inc	The overall process was performed well, however Wolverine Power Supply Cooperative, Inc offers the following comments for process improvement; - More time between the completion of the analysis and the June BOD approval would be provide for more time in the review process.
2: Review Process	Wisconsin Public Service Corporation	<b>Wisconsin Public Service Corporation (WPSC)</b> feels that the stakeholder review and approval of the projects for the June cycle was rushed in order to meet the deadline and it would be helpful if the stakeholders are provided additional time to review and understand the merits of the projects before asking the stakeholders for approval.
2: Review Process	Wolverine Power Supply Cooperative, Inc	In general the review process was performed well, however Wolverine Power Supply Cooperative, Inc offers the following comment for process improvement; - More time between the completion of the analysis and the June BOD approval (the review period) would be favorable to allow a thorough review by the stakeholders. - Questions/Concerns are being repeated at several meetings with responses being severally limited. Timely responses would be much appreciated.
6: Additional Feedback	Consumers Energy Company	<u>General</u> -Projects proposed by Transmission Owners in the MTEP11 June cycle are being requested for Planning Advisory Committee recommendation in May. Power flow models and contingency study results for a proposed June approval should be available by approximately January of that year to allow for thorough stakeholder review.
6: Additional Feedback	Wisconsin Public Service Corporation	<ul style="list-style-type: none"> <li>• <b>MTEP Process in General: Wisconsin Public Service Corporation (WPSC)</b> feels that in recent years the MTEP process is somewhat rushed. While model building and other logistical steps take up considerable amount of time in the front end, studies often had to be hurriedly concluded due to schedule constraints, and resulted in either incomplete documentations, or in inconclusive results. Examples were the JCSP study, the RGOS, the Top Congested Flowgate Study, and the Cross-Border Study. We believe that thoroughness and completeness of studies, which would conceivably impact the market by billions or hundreds of millions of dollars, should take priority over whether arbitrarily set target deadlines are met. Traditionally, individual utilities with service footprint much smaller than MISO knew not to rush large capital decisions and would study transmission expansion plans over multiple years. We urge that MISO be similarly cautious in</li> </ul>

		<p>reaching expansion decisions. It is suggested that the TO-proposed Baseline Reliability Project process that results in Appendices A, B, and C project classifications shall remain as an annual process, but make the MISO initiated Targeted Studies and other ad hoc studies more flexible in terms of study durations and scope, and to allow for more meaningful stakeholder involvements and confidence building. It should be pointed out that, to MISO's credit, this has indeed seemed to be the case lately in instances such as the West Interface Transfer Limit Study, the Wind Planning Analysis Task Team Study, etc.</p>
--	--	---

**MISO Response:**

Excluding the Eaton Rapids out of cycle review project, the projects recommended for approval have been included in the MISO study process since at least the middle of 2010. As part of this process, many TSTFs were held with stakeholder to discuss project drivers and analysis, to provide stakeholders with the maximum information possible at any given time.

However, MISO is constantly searching for ways to improve its processes and provide more meaningful study results. As part of this continuous improvement, a June approval cycle was introduced. We will continue to strive to optimize the approval process as part of this two-approval annual cycle. Beginning in 2012, the results of congestion analyses, such as the Top Congested Flowgate Study and the Cross Border Congested Flowgate Study, will be targeted for this June approval. This will allow adequate time for these studies to be concluded, and for stakeholder review of their results, prior to the recommendation of any projects for approval. Also, targeted studies would be eligible for multi-year study horizons under this new process.

MISO will endeavor to continue to ensure, in subsequent study cycles, that adequate stakeholder review time is provided for all projects recommended for approval.

## Process Improvements

Question	Stakeholder	Comment
6: Additional Feedback	Wisconsin Public Service Corporation	<ul style="list-style-type: none"> <li>Man-power resource limitation is often understandably a constraining factor to MISO. To make better use of the engineering resources available, we suggest that certain types of analyses, such as transient stability and small-signal stability studies be made multi-year studies rather than annual endeavors. The TPL Standard requires stability assessment only on a multi-years basis; therefore it seems unnecessary to perform such studies annually in MTEP. For new resources to be interconnected to the system, the existing Generator Interconnection Process requires the completion of dynamic studies prior to the Interconnection Agreement, and thus ensures the compliance with TPL Standards.</li> </ul>

### MISO Response:

MISO will consider the above suggestions as the scope of the MTEP 2012 cycle is determined. As always, we will attempt to allocate resources to ensure that the maximum benefit is provided to stakeholders, while the system reliability and economics are maintained or improved.

## Report Edits and Clarification

Question	Stakeholder	Comment
5: Report Content	American Transmission Company	<p><b>Here are some suggested edits to the Candidate MVP Portfolio Analysis Interim Report:</b></p> <p>Page 26</p> <p><u>Transmission loss reductions</u></p> <p>In a future scenario where the installed generation capacity is only just sufficient to meet peak load need, a reduction in transmission losses can create benefits through reducing the amount of generation that must be <b>built</b> to serve peak load.</p> <p><u>Enabling Installed Generation Capacity Delivery</u></p> <p>Existing generation capacity may be limited in its ability to acquire Network Resource (NR) status, and therefore <del>use that capacity</del> for <b>may not be able to be used to meet</b> Reserve Margin Requirements. The installation of additional transmission may allow additional generation to achieve NR status, delivering additional capacity value to the system.</p> <p>Page ix of the Appendices</p> <p>Reflect in the title for Table 1.11 that the information is for Wisconsin Investor-Owned Utilities RPS Mandates.</p> <p><b>Here is a suggested edit to the Straits Power Flow Control documentation:</b></p> <p>Reflect in the page headers that the report is for the Straits Power Flow Control rather than the Eaton Rapids Load Interconnection Project.</p>
1: Study Process	Wisconsin Public Service Corporation	<ul style="list-style-type: none"> <li>One minor typo-error in Appendix, Page IX. The RPS description for the State of Wisconsin seems to be correct, but the table labeling says Missouri.</li> </ul>

**MISO Response:**

These changes will be enacted in the report.