2013 Biennial Transmission Projects Report

American Transmission Company, LLC
Dairyland Power Cooperative
East River Electric Power Cooperative
Great River Energy
Hutchinson Utilities Commission
ITC Midwest LLC
L&O Power Cooperative
Marshall Municipal Utilities
Minnesota Power
Minnkota Power Cooperative
Missouri River Energy Services
Northern States Power Company
Otter Tail Power Company
Rochester Public Utilities
Southern Minnesota Municipal Power Agency
Willmar Municipal Utilities

November 1, 2013
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TABLE OF CONTENTS

Page

TABLE OF CONTENTS

Page

1.0 Executive Summary

The 2013 Biennial Transmission Projects Report is the seventh such report prepared since the requirement to prepare this report was established by the Minnesota Legislature in 2001. The requirement is found in Minnesota Statutes § 216B.2425. All of the previous Biennial Reports are available for review on a webpage maintained by the utilities preparing the report. That webpage is:

http://www.minnelectrans.com

That law requires utilities that own or operate electric transmission facilities in the state to report by November 1 of each odd numbered year on the status of the transmission system, including identifying possible solutions to anticipated inadequacies in the transmission system. An "inadequacy" is essentially a situation where the present transmission infrastructure is unable or likely to be unable in the foreseeable future to perform in a consistently reliable fashion and in compliance with regulatory standards.

The 2013 Biennial Report identifies the present and reasonably foreseeable transmission "inadequacies" in the transmission system that exist in each of the six transmission planning zones established by the Minnesota Public Utilities Commission. Those six transmission planning zones are the Northwest Zone, the Northeast Zone, the West Central Zone, the Twin Cities Zone, the Southwest Zone, and the Southeast Zone. Additional information about transmission facilities in each of these zones is provided in the Report. In addition, the Biennial Report provides information about the utilities that own transmission lines in the state. The report also provides an update on the status of the utilities' efforts to meet state Renewable Energy Standard deadlines.

This 2013 Biennial Report, as were the previous reports, is a joint effort of the Minnesota Transmission Owners – those utilities that own or operate high voltage transmission lines in the state of Minnesota. These utilities include the following:

American Transmission Company, LLC
East River Electric Power Cooperative
Hutchinson Utilities Commission
L&O Power Cooperative
Minnesota Power
Missouri River Energy Services
Otter Tail Power Company
Southern Minnesota Municipal Power Agency
Dairyland Power Cooperative
Great River Energy
ITC Midwest LLC
Marshall Municipal Utilities
Minnkota Power Cooperative
Northern States Power Company
Rochester Public Utilities
Willmar Municipal Utilities

The following is a summary of each subsequent chapter of the 2013 Biennial Report.

Chapter 2 describes the biennial reporting requirements. This includes a discussion of the specific information the Public Utilities Commission directed the utilities to include in the 2013 Biennial Report.

Chapter 3 is entitled Transmission Studies. This chapter includes a table listing a number of studies that have been completed over the past two years. In addition, a number of regional studies are described in some detail, and several more local, load-serving studies are identified in a separate table.

Chapter 4 is the Public Participation chapter. This chapter provides a brief background on how transmission planning is conducted in an open and public process through the Midcontinent Independent Transmission Planning Organization (MISO), which most Minnesota utilities belong to. It describes in general terms how the utilities seek involvement from the public and local governmental officials in developing transmission projects and provides a couple of examples of the extensive open houses and public meetings that were held for certain transmission projects. A section is included describing the webpage the Minnesota Transmission Owners maintain (www.minnelectrans.com) to provide the public with information about transmission planning. Finally, the MTO will hold a webinar later in the year that the public can join to hear about the 2013 Biennial Report and ask questions.

Chapter 5 provides general information about the six Transmission Planning Zones in the state.

Chapter 6 is where all the Transmission Needs are identified. The Report identifies well over 100 separate transmission inadequacies across the state, including more than 40 new ones identified in the 2013 Biennial Report.

Each inadequacy is assigned a Tracking Number. The Tracking Number reflects the year the inadequacy was identified and the zone in which it is located. A brief description of each project is provided in the Report, and a reference is provided for each one to where detailed information can be found in an annual report prepared by MISO, called the MISO Transmission Expansion Plan (MTEP) Report. The 2013 MTEP Report, for example, would be called MTEP13.

The MTEP Report referenced in the table for each Tracking Number will contain detailed information about the project, including alternatives, costs, and a schedule. Chapter 6 also presents comprehensive instructions on how to find on the Internet the appropriate MTEP Report containing the desired information. The utilities have also attempted to indicate whether a Certificate of Need (CON) from the Public Utilities Commission might be required for a particular project selected to address a named inadequacy.

Certain projects have been completed since the 2011 Report was filed two years ago or are no longer necessary because of a change in demand or some other factor. These completed projects are listed in a table for each zone in Chapter 6.

Chapter 7 focuses on the 16 utilities that are jointly filing this report. A brief description of each utility and the name and address of a contact person are provided. Information about the number of miles of transmission lines in Minnesota is also provided for each utility.

Chapter 8 provides an analysis of the utilities' progress toward compliance with state Renewable Energy Standards. Not all utilities that own transmission lines are subject to the state Renewable Energy Standards, and some utilities that are not required to participate in the

Biennial Report must meet the RES milestones. All utilities subject to the RES participated in providing information for this part of the report.

For the past several reporting periods, and again this year at the direction of the PUC, the utilities subject to the RES have provided a Gap Analysis. A Gap Analysis is an estimate of how many more megawatts of renewable generating capacity a utility will require beyond what is presently available to meet an upcoming RES milestone of a certain percentage of retail sales from renewables. Generally, the Gap Analysis shows that the utilities are in compliance with present standards and expect to have enough generation and transmission to meet RES milestones through 2016, although demands of neighboring states for renewable energy will undoubtedly affect what resources will be required.

Chapter 8 also addresses Northern States Power Company's needs to meet an upcoming solar energy standard that the Minnesota Legislature just established in 2013 for the year 2020.

PUC Process. Upon receipt of this Report, the Public Utilities Commission will solicit comments from the Department of Commerce, interested parties, and the general public about the Report. Any person interested in commenting on the Report or following the comments of others should check the efiling docket for this matter or in some other manner contact the Public Utilities Commission. The Docket Number is E-999/M-131-402. The precise schedule for filing comments is established by the PUC rules relating to the biennial reporting process. Minn. Rules Chapter 7848. It is anticipated that the PUC will make a final decision on the 2013 Biennial Transmission Projects Report in May 2014.

2.0 Biennial Report Requirements

2.1 Generally

Minnesota Statutes § 216B.2425 requires any utility that owns or operates electric transmission lines in Minnesota to submit a transmission projects report to the Minnesota Public Utilities Commission by November 1 of each odd numbered year. The statute identifies a number of items that are to be included in the report, primarily the identification and analysis of present and reasonably foreseeable future inadequacies in the transmission system.

The Minnesota Public Utilities Commission (MPUC) has adopted rules that govern the content of the transmission projects report and establish procedures for reviewing the report. Those rules are codified in Minnesota Rules chapter 7848. Over the years, in response to experiences with the rule requirements, the PUC has modified the application of these rules in a number of ways, including methods of soliciting public input and reporting on transmission inadequacies. The utilities have followed the applicable procedures and reporting requirements for each report.

This is the seventh such report that the utilities have filed with the Commission, since this reporting requirement was created by the Minnesota Legislature in 2001. Of necessity and for ease of reference, some of the information and narrative in this 2013 Report is similar or identical to what was in previous reports. For example, the discussion in this chapter is similar to what has been in previous reports. The information about the utilities in chapter 7 has been updated but is similar to what was in the last report. The information in chapter 5 on the transmission planning zones across the state created by the Public Utilities Commission is essentially identical to past reports.

While the general information in this report may be repetitive to what is in past reports, it is accurate and up-to-date. Readers may want to check previous reports for additional or historical information. For example, in response to PUC direction, the 2009 Biennial Report contained a discussion of each reporting utility's transformer capability and the 2007 Biennial Report was the first report to identify the miles of transmission line owned by each utility. The 2007 Report included an entirely separate report called the Renewable Energy Standards Report, a one-time requirement of the 2007 Renewable Energy Act (Minn. Laws 2007, ch. 3, § 2.).

Readers who would like to review information contained in previous reports can find those reports readily available in their entirety in electronic form at the webpage maintained by the utilities regarding transmission planning. That webpage is:

http://www.minnelectrans.com

In addition, complete biennial reports and other documents related to the Public Utilities Commission's review and approval of those reports can be found on the Commission's edockets webpage using the Docket Number from the table below. Visit this webpage and plug in the Docket Number in the search box:

http://www.edockets.state.mn.us

Biennial Report	PUC Docket Number	PUC Order
2013	E-999/M-13-402	
2011	E-999/M-11-445	May 18, 2012
2009	E-999/M-09-602	May 28, 2010
2007	E-999/M-07-1028	May 30, 2008
2005	E-999/TL-05-1739	May 31, 2006
2003	E-999/TL-03-1752	June 24, 2004
2001	E-999/TL-01-961	August 29, 2002

2.2 Specific Reporting Requirements for 2013

The Minnesota Transmission Owners (MTOs) submitted the 2011 Biennial Report on November 1, 2011. The Public Utilities Commission afforded interested persons an opportunity to submit comments regarding the completeness of the Biennial Report. After considering all comments that were filed, the Commission issued its Order Accepting Reports, Granting Variance, and Setting Additional Requirements on May 18, 2012. PUC Docket No. E-999/M-11-445

One additional requirement established by the Commission in its 2012 Order directs the reporting utilities to include in the 2013 Report "A separate section which discusses MTO's outreach to and continued efforts to secure input on transmission planning issues from local governments." This information is included in section 4.2.

The Commission also ordered the utilities to "continue to work to improve its transmission planning webpage." The efforts the utilities have undertaken to make improvements are described in section 4.3.

One final point the Commission directed the utilities to address in this report is an update on the Corridor Update Project. This information is found in section 3.3.

In its May 30, 2008, Order approving the 2007 Report, the Commission directed the utilities to continue to include in future reports a discussion of transmission issues related to meeting state renewable energy standards. In this report, as in the 2009 and 2011 reports, the utilities have provided a Gap Analysis showing their upcoming needs for renewable energy to meet RES milestones. A Gap Analysis is an estimate of how many more megawatts of renewable generating capacity a utility will require beyond what is presently available to meet an upcoming RES milestone of a certain percentage of retail sales from renewables. This Gap Analysis is found in Chapter 8.

Beginning with the 2011 Report, and with the approval of the Commission, the utilities who belong to the Midcontinent Independent Transmission System Operator (MISO) revised the manner in which they reported on identified transmission inadequacies. Instead of reporting in detail on each transmission inadequacy, the report includes a reference to where in the annual reports of MISO, detailed information about the project can be found. That approach is continued in this report.

The annual MISO report is called the MISO Transmission Expansion Planning Report (MTEP). Directions for finding the appropriate MTEP report for a particular transmission project are found in section 6.1 and are essentially identical to the directions included in the 2011 Report.

2.3 Reporting Utilities

Minnesota Statutes § 216B.2425 applies to those utilities that own or operate electric transmission lines in Minnesota. The PUC has defined the term "high voltage transmission line" in its rules governing the Biennial Report to be any line with a capacity of 200 kilovolts or more and any line with a capacity of 100 kilovolts or more and that is either longer than ten miles or that crosses a state line. Minn. Rules part 7848.0100, subp. 5. Each of the entities that is filing this report owns and operates a transmission line that meets the PUC definition. Information about the utility and transmission lines owned by each utility is provided in Chapter 7 of this Report. In addition, a contact person for each utility is included in Chapter 7.

The statute allows the entities owning and operating transmission lines to file this report jointly. The Minnesota Transmission Owners (MTO) have elected each filing year to submit a joint report and do so again with this report. The utilities jointly filing this report are:

American Transmission Company, LLC
Dairyland Power Cooperative
East River Electric Power Cooperative
Great River Energy
Hutchinson Utilities Commission
ITC Midwest LLC
L&O Power Cooperative
Marshall Municipal Utilities
Minnesota Power
Minnkota Power Cooperative
Missouri River Energy Services
Northern States Power Company d/b/a Xcel Energy
Otter Tail Power Company
Rochester Public Utilities
Southern Minnesota Municipal Power Agency
Willmar Municipal Utilities

Of the above utilities, East River Electric Power Cooperative, L&O Power Cooperative, Marshall Municipal Utilities, Minnkota Power Cooperative, Rochester Public Utilities and Willmar Municipal Utilities are not members of MISO; all the others are.

2.4 Certification Requests

Minnesota Statutes § 216B.2425, subd. 2, provides that a utility may elect to seek certification of a particular project identified in the Biennial Report. According to subdivision 3, if the Commission certifies the project, a separate Certificate of Need (CON) under section 216B.243 is not required.

On May 23, 2013, the MTO advised the Commission that there would be no certification requests included with the 2011 Biennial Report.

3.0 Transmission Studies

3.1 Introduction

The Public Utilities Commission requires that the utilities include in each Biennial Report a "list of studies that have been completed, are in progress, or are planned that are relevant to each of the inadequacies identified" in the Report. Minnesota Rules part 7848.1300, item F. Information about the transmission planning process and about previous studies that have been completed over the years can be found in earlier Biennial Reports, beginning with the 2005 Report.

In this 2013 Biennial Report, the utilities first identify in Section 3.2 a number of studies that have been completed since the 2011 Biennial Report was submitted in November 2011. These studies primarily address expansion of the transmission network to address generation expansion, in particular renewable energy, or address local inadequacy issues (noted with a Tracking Number). Section 3.3 describes ongoing regional studies that focus on expansion of the bulk electric system to address broad regional reliability issues and support expansion of renewable in the upper Midwest. Section 3.4 focuses on ongoing load serving studies that are attempting to resolve local inadequacy issues. Section 3.5 describes certain studies at the national level that are underway. Section 3.6 describes the MAPP Load & Capability Report, which PUC rules (part 7848.1300, item B) require, but which is no longer prepared.

3.2 Completed Studies

The following studies have been completed since November 2011. Previously completed studies are identified in earlier Biennial Reports and are not repeated here. In some cases studies have been commenced and completed between November 2011 and November 2013 and were not identified in the 2011 Biennial Report. Where specific transmission projects have been identified, a Tracking Number is provided. The Tracking Number identifies the year the project was first considered for inclusion in a Biennial Report and the zone where the project is located.

Study Title	Year Completed	Utility Lead	Description
OTP High Voltage Study	2012	OTP	This study investigated the capability of the OTP high voltage transmission system for both near term and out year study assumptions. When limitations were identified, mitigation was recommended and tested to select the best fit plan. MPC helped perform this study and an ad hoc group of GRE, MRES, BEPC, MPC, MP, WAPA, NSP, EREPC, CPEC and MISO, was formed to help facilitate optimal solutions. This study was also presented at numerous West Technical Studies Task Force meetings within MISO for an open and transparent planning process.
Winger Thief River Falls Timing Study	2012	OTP	The analysis performed for this study focused on the optimal timing or implementation of a new Winger to Thief River Falls 230 kV line which was recommended from the OTP High Voltage Study. This study incorporated the best available load assumptions. The tracking number for related projects is 2007-NW-N3.
Clearbook Loop Study	2012	OTP	Clearbrook is an OTP substation that is expected to have a large amount of load growth within the next few years. This study focused on the best mitigation to most reliably serve the new and existing load.
Bemidji Study	2012	OTP	Bemidji is one of the most rapidly growing areas of the OTP service territory. To accommodate the predicted load growth, a new delivery system for the city was developed from this study.
Otter Tail Power/Minnkota Power Long Range Transmission Study	2012	OTP	OTP has worked extensively with MPC to develop detailed models of the joint 41.6 kV system for current year, 10-year, and 20-year winter peak timeframes. A detailed review of the joint OTP/MPC 41.6 kV and 69 kV systems has identified some transmission projects needed for the upcoming 10 year time horizon that will be coordinated between OTP and MPC. Refined timing of these studies will be completed in the OTP Ten Year Plan which is expected to be completed in 2014.

Study Title	Year Completed	Utility Lead	Description
Keetac Expansion System Impact Study	2011	MP	System impact of proposed expansion at Keetac mine; identified a need for improved reliability and voltage support in the area; Mesabi 115 kV Project (2013-NE-N4)
39 Line Reconfiguration	2012	MP	Evaluation of alternatives for removal/reconfiguration of Laskin – Virginia 115 kV Line; 39 Line Reconfiguration (2013-NE-N1)
Deer River Area Reliability 230 kV Substation	2012	MP	Evaluation of impact of new 230 kV substation and retirement of existing 115 kV line in Deer River area; Deer River 230 kV Project (2009-NE-N2)
NERC Facility Ratings Alert "Minimum Required Ratings" Analysis	2012	MP	Historical data and load flow analysis to evaluate the potential for transmission line derates to address the Facility Ratings Alert; NERC Facility Ratings Alert Medium Priority (2013-NE-N14) & NERC Facility Ratings Alert Low Priority (2013-NE-N15)
North Shore Unit Retirements	2012	MP	Preliminary Analysis of steady state and dynamic impact of various combinations of small coal unit retirements on MP's system
Dorsey – Iron Range 500 kV Project Preliminary Stability Analysis	2012	MP	Preliminary stability analysis on new 500 kV tie line configurations; Great Northern Transmission Line (2013-NE-N13)
Manitoba – United States Transmission Development Wind Injection Study	2013	MP	Identify and evaluate incremental Western Minnesota wind injection capability in conjunction with 1100 MW of new Manitoba to United States transmission service requests and their associated facilities; Great Northern Transmission Line (2013-NE-N13)
BSSE Reactive Study	2013	OTP	OTP is an owner of a new Multi-Value Project (MVP)_ line which runs from Ellendale ND to Big Stone, SD. Because of the long length of this new 345 kV line and the operational challenges that come with such a long line, a study was performed to determine the appropriate reactive compensation to install with the line.

Study Title	Year Completed	Utility Lead	Description
Minnesota Transmission Assessment and Compliance Team 2013 Transmission Assessment (2013 – 2023)	2011	MTO	This report is an annual transmission assessment investigating near-term, mid-term, and long-term transmission conditions. The purpose of this study is to develop an understanding of the transmission system topology, behavior, and operations to determine if existing and planned facility improvements meet NERC Transmission Planning Standards TPL-001 through TPL-004.
Oakes Area Optimization	2013	OTP	These studies investigated the optimal conductor size and cap bank size/location to most efficiently and reliably serve the load in the Oakes Area with the new Oakes 41.6 kV line.
Otter Tail Power Company / Great River Energy/Missouri River Energy Systems Long Range Plan	2013	OTP	OTP has worked extensively with GRE and MRES to develop detailed models of the joint 41.6 kV system for current year, 10-year, and 20-year winter peak timeframes. A detailed review of the joint OTP/MRES/GRE 41.6 kV system has identified some transmission projects needed for the upcoming 10 year time horizon that will be coordinated between OTP, GRE and MRES. Refined timing of these studies will be completed in the OTP Ten Year Plan which is expected to be completed in 2014.
Audubon Area Load Serving Study	2012	MRES	This study is complete and has verified the need for more voltage/reactive support in the Audubon/Detroit Lakes area. The required improvements are in the MISO MTEP 13 Report.

3.3 Regional Studies

While every study that is undertaken adds to the knowledge of the transmission engineers and helps to determine what transmission will be required to address long-term reliability and to transport renewable energy from various parts of the state to the customers, some studies are intentionally designed to take a broader look at overall transmission needs. Regional studies analyze the limitation of the regional transmission system and develop transmission alternatives that support multiple generation interconnect requests, regional load growth, and the elimination of transmission constraints that adversely affect utilities' ability to deliver energy to the market in a cost effective manner. Many of these studies are especially important for focusing on transmission needs for complying with upcoming Renewable Energy Standards.

3.3.1 MISO Transmission Expansion Plans

The Midcontinent Independent System Operator (MISO) engages in annual regional transmission planning and documents the results of its planning activities in the MISO Transmission Expansion Plan (MTEP). The MTEP process is explained in detail in chapter 6 since the latest MTEP reports are being relied on to provide information about the transmission inadequacies identified in this Report. Earlier MTEP Reports were summarized in past Biennial Reports. For convenience, the following brief description of the latest MTEP reports is presented here. The MISO Expansion Plans are available on the MISO webpage. Visit http://www.misoenergy.org and click on "Planning."

MTEP11 Report

The 2011 MISO Transmission Expansion Plan was approved by the MISO Board of Directors on December 8, 2011. MTEP 11 recommended $6.5 billion in new transmission expansion through the year 2012 in the region.

MTEP12 Report

The 2012 MISO Transmission Expansion Plan was approved by the MISO Board of Directors on December 13, 2012. The subtitle of the report continues from 2009 – "Energizing the Heartland." On the first page of the Executive Summary, the Report states:

> MTEP 12 recommends $1.5 billion in new transmission expansion through 2022 for inclusion in Appendix A and eventual construction. This is part of a continuing effort to ensure a reliable and efficient electric grid that keeps pace with energy and policy demands.

The MTEP12 Report identifies those projects required to maintain reliability for the ten year period through the year 2022 and recommends 242 new projects for inclusion in Appendix A.

MTEP13 Report

The 2013 MISO Transmission Expansion is presently in draft form. The report will be completed and approved by the MISO Board of Directors in December of 2013. On the first page of the Executive Summary of the September 30, 2013 draft the Report states:

> As part of MTEP13, MISO staff recommends $1.58 billion of new transmission expansion through 2023, as described in Appendix A to the MISO Board of Directors for review, approval and subsequent construction.

The MTEP13 Draft Report identifies 317 new projects required to maintain reliability for the ten year period through the year 2023.

3.3.2 Manitoba Hydro-Electric Board Transmission Service Request

MISO continues to process generation interconnection requests and transmission service requests (TSRs) on the transmission system that they operate. One group of these TSRs involves an increase in the ability to transfer power from Manitoba into the United States. The original Manitoba Hydro TSRs requested delivery totaling 1,100 MW from Manitoba Hydro to four TSR customers in the United States (north to south), and 1,100 MW from utilities in the United States to Manitoba Hydro (south to north). An initial System Impact Study was completed in June 2009 for Firm Point-to-Point Transmission Service between Manitoba Hydro and the TSR customers. The initial study considered several 500 kV transmission options for increasing the capability of the Manitoba – United States interface by 1100 MW flowing north or south. The study was conducted by Siemens PTI and an ad hoc study group consisting of Manitoba Hydro, MISO, and several utilities in the Upper Midwest. Several transmission options extending from the Winnipeg area into the United States via northeastern Minnesota or the Red River Valley were considered in the initial study. A follow-up System Impact Study completed in April 2010 evaluated the impact of a new 500 kV interconnection from the Winnipeg area to the planned CapX2020 Bison Substation near Fargo, North Dakota.

Recently, MISO has conducted a series of sensitivities on the Bison option to evaluate alternative transmission scenarios for achieving 250 MW, 750 MW, or 1100 MW of increased transfer capability from Manitoba to the United States. The MISO TSR Sensitivity Studies have included a “Western Option” extending new 500 kV transmission to the Fargo-Moorhead area in western Minnesota, an “Eastern Option” extending new 500 kV transmission to the Iron Range in northeastern Minnesota, and a “230 kV Option” extending new 230 kV transmission to the Iron Range. While the two 500 kV options could facilitate increased transfers of 750 MW, 1100 MW or more, the 230 kV Option would facilitate only Minnesota Power’s 250 MW power purchase agreement (PPA) with Manitoba Hydro. The MISO TSR Sensitivity Studies have demonstrated that the alternative transmission options at their associated transfer levels do not result in negative impacts to the bulk electric system.

In order to facilitate delivery of power under Minnesota Power's PPA, which requires new transmission to be in service by June 1, 2020, Minnesota Power and Manitoba Hydro have elected to begin moving forward with an Eastern 500 kV project. This project involves extension of a new 500 kV line from the Dorsey Substation in Manitoba to the Blackberry Substation on the Iron Range. The new 500 kV tie line will facilitate increased transfers of 750 MW, including Minnesota Power's 250 MW plus additional capability for Manitoba Hydro to deliver power to the remaining TSR customers or others. A future 345 kV build from Blackberry to the Arrowhead Substation near Duluth, MN would facilitate a further increase in total transfer capability from Manitoba to the United States of at least the 1100 MW originally required by the TSRs when the additional capability is needed. The project, known in Minnesota as the "Great Northern Transmission Line", is currently in the early stages of permitting in both Manitoba and Minnesota. More information can be found in Section 6 under project 2013-NE-N13 (MTEP ID's #3831 and 3832).

3.3.3 Manitoba Hydro Wind Synergy Study

The variable and non-peak nature of wind creates integration challenges within MISO. Manitoba Hydro, with its large and flexible system, offers potential solutions for meeting these challenges. At the prompting of Manitoba Hydro (MH) and the potential customers of output from their new hydroelectric dams, MISO conducted the Manitoba Hydro Wind Synergy Study to evaluate whether the cost of expanding the transmission capacity between Manitoba and MISO would enable greater wind participation in the MISO market.

MISO used a new study tool (PLEXOS) to model the day-ahead and real-time markets as well as to capture the uncertainties of wind and load between what is forecasted in the day-ahead market and actual conditions in the real time market. A combination of traditional simulation techniques and new ones developed specifically for this study allowed for a diverse set of benefits to be examined. The synergy between wind and hydro was explored in great detail along with the cost savings of increasing energy delivered into MISO. The benefits of these findings are substantial and show that expanded participation of Manitoba Hydro in the MISO market through increased transmission, generation and market changes would benefit all parties involved.

MISO completed its first comprehensive study that looks at the synergy between hydro power and wind power in June 2013. The Manitoba Hydro Wind Synergy Study found significant benefits can be realized from the addition of either an eastern 500 kV line between Dorsey, Manitoba, and Duluth, Minn., or a western 500 kV line between Dorsey, Manitoba, and Fargo, N.D./Moorhead, Minn (Figure E1).

Transmission Options	20 Year Present Value Benefits ($M-2012)	20 Year Present Value Costs, transmission only ($M-2012)	B/C Ratio averaged over all futures	2012 Nominal Cost Estimate ($M-2012)
East 500kV Option	$1,586	$666	2.38	$685
West 500kV Option	$1,588	$582	2.73	$598

Table E1: Weighted Present Value Benefits and costs (averaged across futures)

The benefit metrics used in the Manitoba Hydro Wind Synergy are indicative of savings MISO may experience if either of the transmission plans were constructed, but they cannot be used to justify cost sharing of either project under the current MISO tariff. The benefits found in this study cannot be used in the Market Efficiency Planning Study (MEPS) to justify project eligibility since the studies use different assumptions and different benefit metrics. The main difference between the two studies is the Manitoba Hydro Wind Synergy Study includes the benefits of incremental hydro generation in the benefit metric. A hypothetical Market Efficiency Project eligibility test was conducted and found that MISO would receive no Adjusted Production Cost benefit from the construction of either line under the current MISO tariff and using the current MTEP12 models. Looking at these projects from a market efficiency perspective does not capture the purpose of the transmission plans.

Based on the preliminary analyses from the Wind Synergy Study, MISO recommended both projects for inclusion in MTEP13 Appendix B.

3.3.4 Northern Area Study

The MISO Northern Area Study was complimentary and closely coordinated with the Manitoba Hydro Wind Synergy Study, the Manitoba Hydro TSR Sensitivity Studies and Market Efficiency Planning Study. The Northern Area Study was developed as an exploratory study to understand how the development of new potential Manitoba – MISO tie-lines, changing mining/industrial load levels, and the retirement of generating units dictate transmission investment in MISO's footprint. The Northern Area Study originated because of multiple transmission proposals and reliability issues located in MISO's northern footprint. Developed through a technical review group (TRG) , the objective of the Northern Area Study was to:

- Identify the economic opportunity for transmission development in the area
- Evaluate the reliability & economic effects of drivers on a regional, rather than local, perspective
- Develop indicative transmission proposals to address study results with a regional perspective
- Identify the most valuable proposal(s) & screen for robustness

The Northern Area Study was a collaborative effort between stakeholders and MISO staff. Meetings were open to all stakeholders and interested parties - study participants included state regulatory agencies, transmission owners, market participants, environmental groups, and industry experts. A stakeholder technical review group (TRG) was involved in all discussions and decisions.

The potential for industrial load increases and decreases was the first scenario driver for the Northern Area Study. The driver for studying industrial load levels in Northern Area Study scenarios originated with a request to evaluate transmission potential through the Upper Peninsula of Michigan to accommodate additional mining opportunities. Industrial load change potential was later expanded to the larger Northern Area Study region after the June 7, 2012 TRG meeting. The increased industrial load potential included approximately 300 MW in northern Wisconsin/Michigan's Upper Peninsula, 600 MW in northern Minnesota, and 1,000 MW in western North Dakota. Additionally, there was a similar potential to decrease area industrial load through the closing of mines and industrial plants.

The second scenario driver in the Northern Area Study was a potential for increased generation and imports from Manitoba Hydro. Manitoba Hydro has development plans for adding two additional hydro units, Keeyask (695 MW) and Conawapa (1,485 MW). The Conawapa and Keeyask units would be phased-in from 2019 through 2027. Together, the units would increase import potential into MISO by approximately 1,100 MW, while the remaining capacity would serve Manitoba Hydro load. To deliver 1,100 MW of imports to the MISO footprint three different tie-lines were proposed. Those three tie-line configurations are shown in Figures 1-3 through 1-5 below. The Northern Area Study provides no indication or comparison between Manitoba to MISO tie-line options. Tie-lines and new hydro generation were inputs to the Northern Area Study to determine economic development opportunities after the tie-lines and generating units are built and in-service – essentially answering what if any build-out is required for MISO's entire northern footprint to realize the benefits of new Manitoba imports.

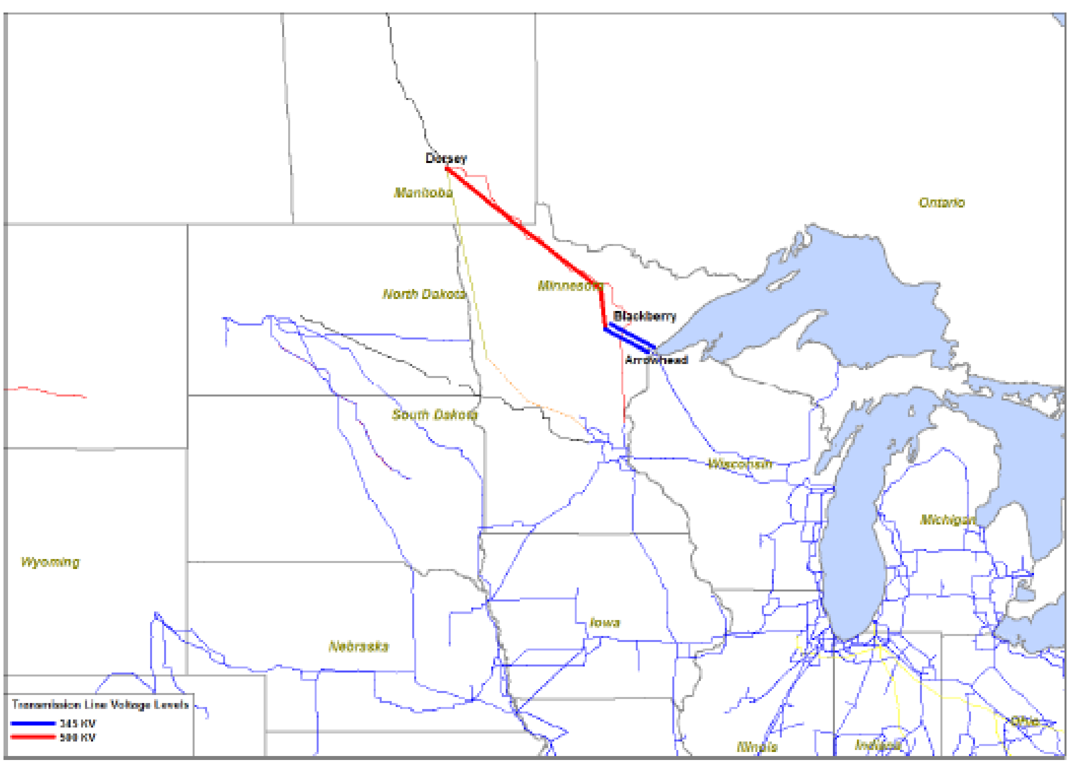


Figure 1-3: Manitoba - Duluth 500 kV Tie-Line

Figure 1-4: Manitoba – Fargo Area 500 kV Tie-Line

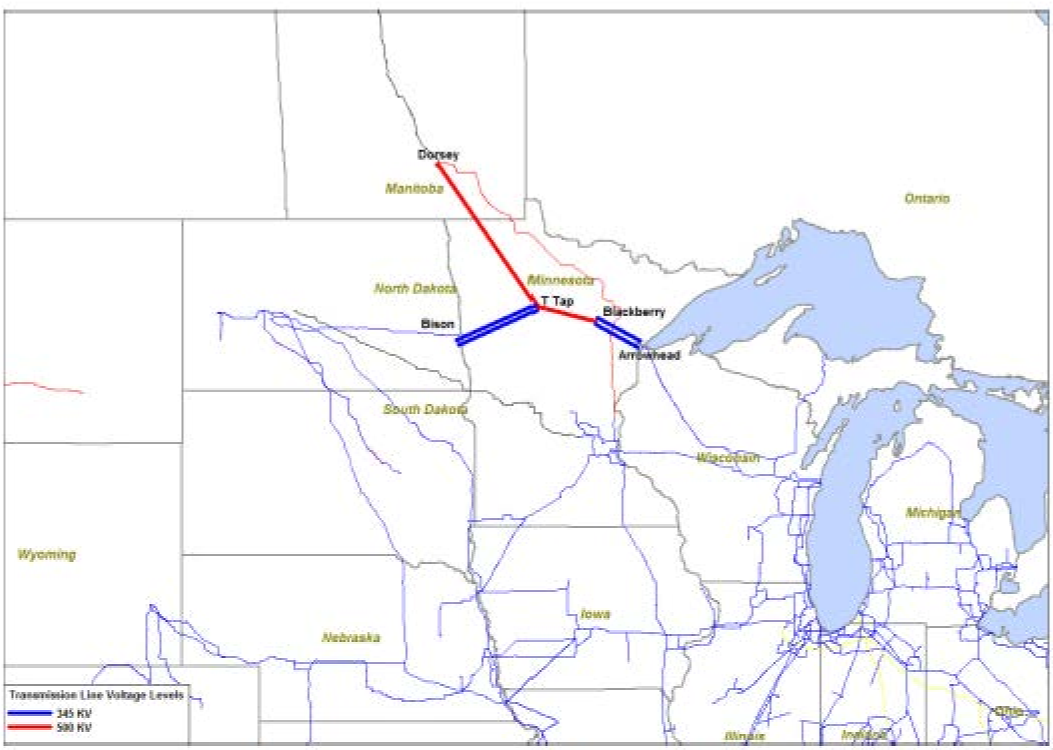


Figure 1-5: Manitoba – Fargo and Duluth "T" 500 kV Tie-Line

The final Northern Area Study driver was unit retirements, specifically the potential retirement of the Presque Isle Power Plant in Marquette, Michigan. Prior to the Northern Area Study kick-off meeting on June 7, 2012, a public announcement was made saying the Presque Isle Power Plant was likely retire by 2017/2018 due to the United States Environmental Protection Agency (EPA) regulations. The retirement of this plant was expected to cause area reliability issues. On November 27, 2012. We Energies and Wolverine Power Cooperative announced an agreement that would keep the Presque Isle Power Plant operational by adding emission controls to the five units. After the Presque Isle public announcement, the Northern Area Study eliminated all scenarios which retired Presque Isle from the analysis.

3.3.5 Multi-Value Project Portfolio

In July 2010, MISO submitted tariff revisions to the Federal Energy Regulatory Commission (FERC) to establish a new category of transmission projects. The new Multi-Value Project (MVP) tariff provisions provide broad cost allocation for a portfolio of projects that meet at least one of the following three criteria:

1. Enable the transmission system to deliver energy in support of public policy requirements (such as Renewable Energy Standards)

2. Provide reliability and economic benefits in excess of project costs

3. Address transmission issues associated with projected NERC violations and at least one economic–based transmission issue that provides economic benefits in excess of project costs across multiple pricing zones

FERC approved the MISO MVP tariff (and related tariff provisions related to generation interconnection costs) in December 2010, and FERC denied all requests for rehearing in October 2011. FERC Docket No. ER10-1791-000 Order Conditionally Accepting Tariff Revision (Dec. 16, 2010).

MISO has approved 17 projects in the Upper Midwest for MVP certification, including the CapX2020 Brookings County-Hampton line and the ITCM Minnesota-Iowa 345 kV project that is part of MCP #3. Other Upper Midwestern lines include proposed projects in Iowa, North Dakota, South Dakota and Wisconsin.

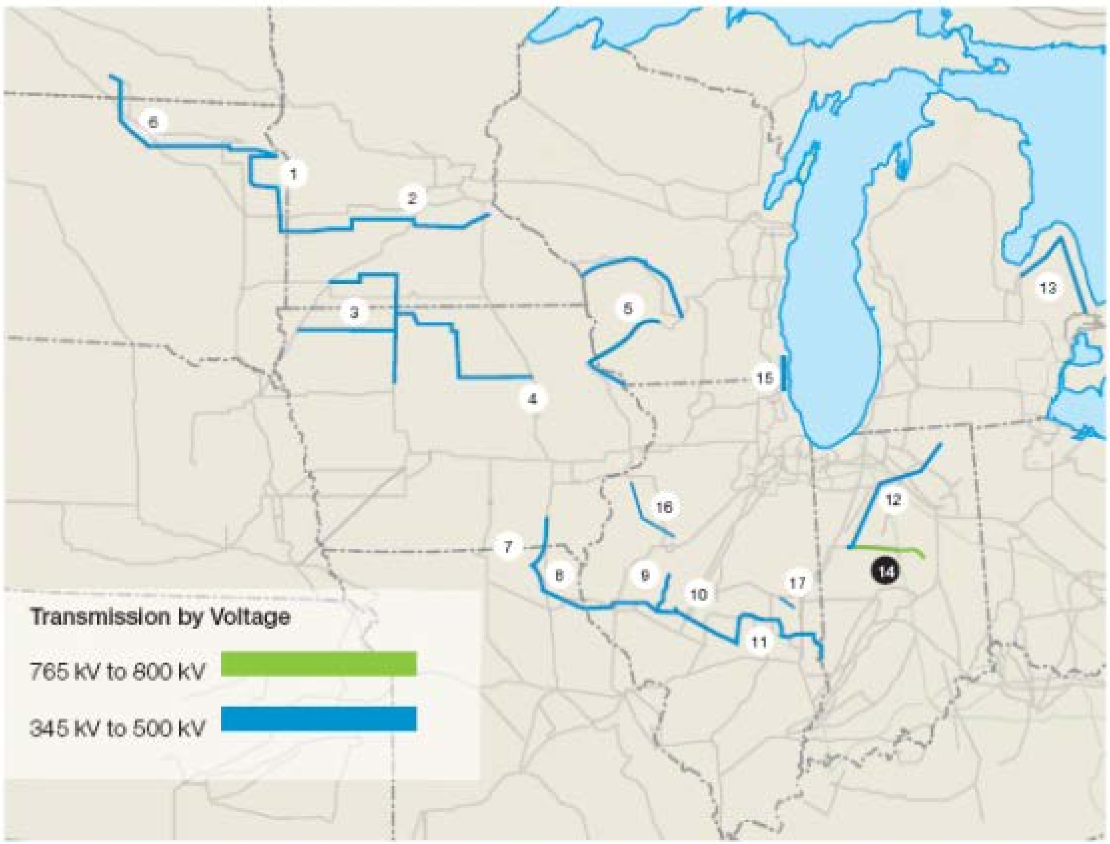
The MVP Portfolio received MISO Board of Director approval in December of 2011.

MISO’s business analysis demonstrates that all MISO members will benefit from construction of the MVP projects in excess of project costs. The benefits range from 1.8 to 5.8 times the total cost of all projects. In other words, for every dollar spent on construction, MISO members will receive benefits between $1.80 and $5.80.

Overall, the approved MVP portfolio enables the delivery of 41 million megawatt hours of renewable energy annually.

MISO analysis also identifies significant reliability benefits that will be realized from the MVP projects by strengthening the overall transmission system. The approved MVP portfolio resolves approximately 500 thermal overloads for approximately 6,400 system conditions, and resolves 150 voltage violations for approximately 300 system conditions.

The map below shows the 17 MVP projects.



Proposed Multi-Value Projects

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

3.3.6 Market Efficiency Planning Study

As part of its planning process, the MISO conducts a Market Efficiency Planning Study (MEPS) whose purpose is to determine whether there are transmission projects that could remove transmission constraints and thus more efficiently use available generation resources. The MEPS results are reported as part of the annual MTEP report.

During the MEPS process, projected economic and power flow models are developed which, when analyzed, determine the total production costs that are incurred to provide energy to the MISO load. Transmission constraints, which are the transmission elements that limit the amount of power that can be transferred between the unused, lower-cost generation and the load, are identified.

Through a stakeholder discussion, transmission projects are proposed which could mitigate the constraints. The costs for these proposed transmission projects are determined and compared to the amount of production cost savings that could be realized if those projects were in service. The resultant benefit to cost (B/C) ratio of the projects indicates whether the proposed solutions should be considered for further evaluation for constructability and reliability analysis. Stakeholder review and comments are compiled and a decision on whether to recommend a MEPS project be included in the upcoming MTEP report is made.

3.4 Load Serving Studies

Load serving studies focus on addressing load serving needs in a particular area or community. Since many of the inadequacies in Chapter 6 are load serving situations, many of these studies relate to specific Tracking Numbers. These are all studies that have been identified since completion of the 2011 Biennial Report.

Study Title	Anticipated Completion	Utility Lead for Study	Description
Otter Tail Power Ten Year Plan	2014	OTP	The Otter Tail Ten Year Plan will summarize the limitations to the OTP system within the next ten years and is intended to be refreshed annually or at least biennially. This study will refresh project need dates and is based from conclusions of the recently completed group of Long Range Plans and the OTP High Voltage study
MPC Overall 69 kV Study	2015	MPC	The MPC Overall 69 kV Study will focus on reviewing the adequacy of the MPC 69 kV system for serving load from both primary feeds and alternate feeds during outages.
Magnetation Plant 4 System Impact	2013	MP	System impact of Magnetation Plant 4; Canisteo Project (2013-NE-N5)

Study Title	Anticipated Completion	Utility Lead for Study	Description
Polymet System Impact	2013	MP	System impact of new Polymet loads; NorthMet (f/k/a “Dunka Road”) Substation (2011-NE-N5) & Hoyt Lakes Substation Modernization (2013-NE-19)
Boswell – Zemple 230 kV Line Outage Study	2013	MP	Evaluate the performance of MP 115 kV system and GRE 69 kV system during Boswell – Zemple 230 kV line outage; Deer River 230 kV Project (2009-NE-N2)
Duluth/Superior Area Study	2013	MP	10-year outlook for Duluth/Superior area to re-evaluate the need for Duluth 230 kV Project (2007-NE-N1), Haines Road Capacitor Bank (2013-NE-20), and/or other projects in the area.
Xcel Energy 10-Year Plan Load Serving Study	2010, updated annually	NSP	NSP completes an annual load serving study for the Minnesota, North and South Dakota and Wisconsin territories. A slide presentation summarizing the most recent study and results is at the following link: http://www.xcelenergy.com/staticfiles/xe/Corporate/Corporate%20PDFs/NSP%202010%20transmission%20plan%20-FINAL.pdf

3.5 National Studies

3.5.1 Eastern Interconnection Planning Collaborative

In mid-2009 the Department of Energy (DOE) issued a funding opportunity announcement DE-FOA-0000068 “Resource Assessment and Interconnection-level Transmission Analysis and Planning,” directed to the Eastern, Western, and Texas interconnections. PJM Interconnection, LLC (PJM) bid for and won the Topic A portion of this FOA for the Eastern Interconnection, award DE-OE0000343, supported by nine members1 of the Eastern Interconnection Planning Collaborative (EIPC). EIPC had been formed earlier in 2009 by 25 of the larger Planning Authorities in the Eastern Interconnection.

The work under this funding opportunity was divided into two phases. Phase 1 began with the creation of a combined grid model for the Eastern Interconnection (the “roll-up” case) and the formation of a diverse Stakeholder Steering Committee (SSC) with interests in public policy “futures”. Work continued with macroeconomic and generation resource allocation studies of eight futures chosen by the SSC, and the modification of the roll-up case into a Stakeholder Specified Infrastructure (SSI). Finally the SSC chose three future scenarios as the basis for Phase 2 of the project:

1. A Nationally Implemented Federal Carbon Constraint with Increased Energy Efficiency/Demand Response, (Scenario 1: Combined Policies)

2. A Regionally Implemented National Renewable Portfolio Standard (Scenario 2: National Renewable Portfolio Standard/Implemented Regionally), and

3. Business as Usual (Scenario 3: Business as Usual).

An interim report describing Phase 1 studies and results was released in December 2011 (http://www.eipconline.com/uploads/Phase_1_Report_Final_12-23-2011.pdf). Phase 2 included transmission studies and production cost analyses of the three future scenarios chosen by the stakeholders. This included developing transmission options, studying grid reliability and production costs, and estimating generation, transmission, and selected "other" costs. A number of sensitivities were studied for the three scenarios. The sensitivities included four sensitivities to investigate the amount of wind curtailment in Scenario 1 which was 15% in the base run. They also included analyzing high loads and high gas prices in Scenario 3.

This Topic A work was carried out in close interaction with the Eastern Interconnection Topic B recipient of DOE-FOA-0000068, the National Association of Regulatory Utility Commissions (NARUC), and the state representative's group formed through their award, the Eastern Interconnection States Planning Council (EISPC). EISPC members include regulatory representatives from the 39 states of the Eastern Interconnection, the District of Columbia, and the City of New Orleans. While the EISPC report on this work will be published separately, this report includes input from the EISPC. DOE is additionally supporting the Interconnection-Level Transmission Planning Analysis through work at selected national laboratories on grid frequency response and on fault induced delayed voltage recovery. A Phase I report was filed with the Department of Energy in December of 2011. A Phase II report was completed on December 22, 2012 and submitted to the Department of Energy. The Phase II Report is linked here: http://www.eipconline.com/Phase_II_Documents.html

With the completion of the majority of the Phase 2 work by EIPC, the Eastern Interconnection Topic A work scope has now met the goals initially defined in the Statement of Project Objectives. One aspect highlighted in Phase 1 of the project but not studied in detail is the interrelationships of various energy related infrastructures. These interrelationships are being considered further to better understand how these relationships might impact the broad range of alternative futures. One example is the relationship between the natural gas supply and delivery infrastructure and the electric transmission system. This topic is currently being studied as an extension of the Phase 2 EIPC work and insights from this additional work will be added to the Phase 2 study report.

A number of valuable conclusions were drawn from the study work to date. While the results were not intended as a specific plan of action or for use in any state electric facility approval or siting processes, and did not include all mandatory NERC reliability planning requirements, they do provide general information to policy-makers and stakeholders and will serve as guidelines in future activities of EIPC as it focuses on its continuing scope. As the first interconnection-wide study of its kind, the work provided insights to EIPC members regarding how future studies may be performed and how future interconnections may develop.

Other benefits of the study included an interaction and development of experience between Planning Authority participants and state participants. The formation of the Stakeholder Steering Committee (SSC), which represented a wide range of interests, presented challenges but both EIPC and SSC found substantial advantages resulting from the study, as well as identifying opportunities for improvement in the future.

Below are the three transmission options developed for each of the three future scenarios, followed by a summary of the costs estimated for each scenario.

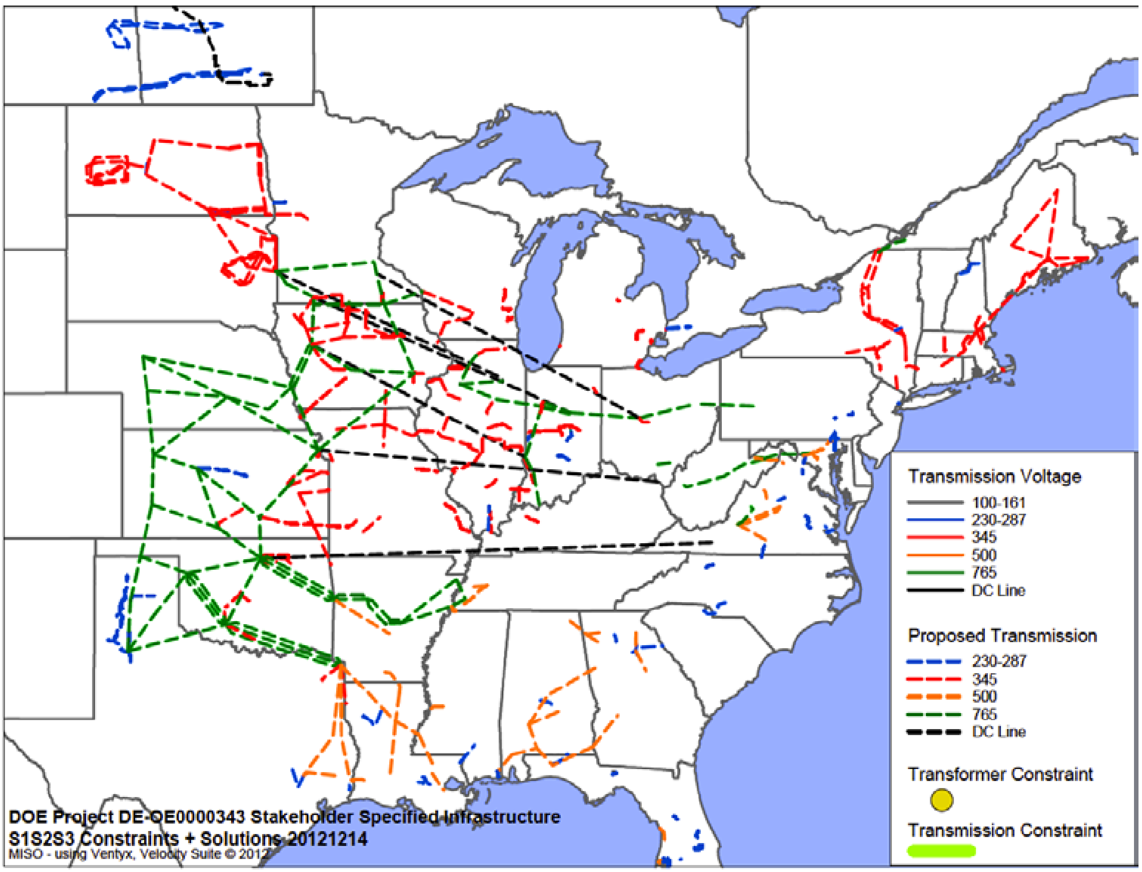


Figure ES-1. Scenario 1: Combined Policies – New/Upgraded Transmission
Approximate 2030 O&M Costs - ($2010 Billions) cost for Scenario 1: $149.6 Billion
Overnight Capital Costs for Capital through 2030 ($2010 Billions) for Scenario 1: $978.2 Billion

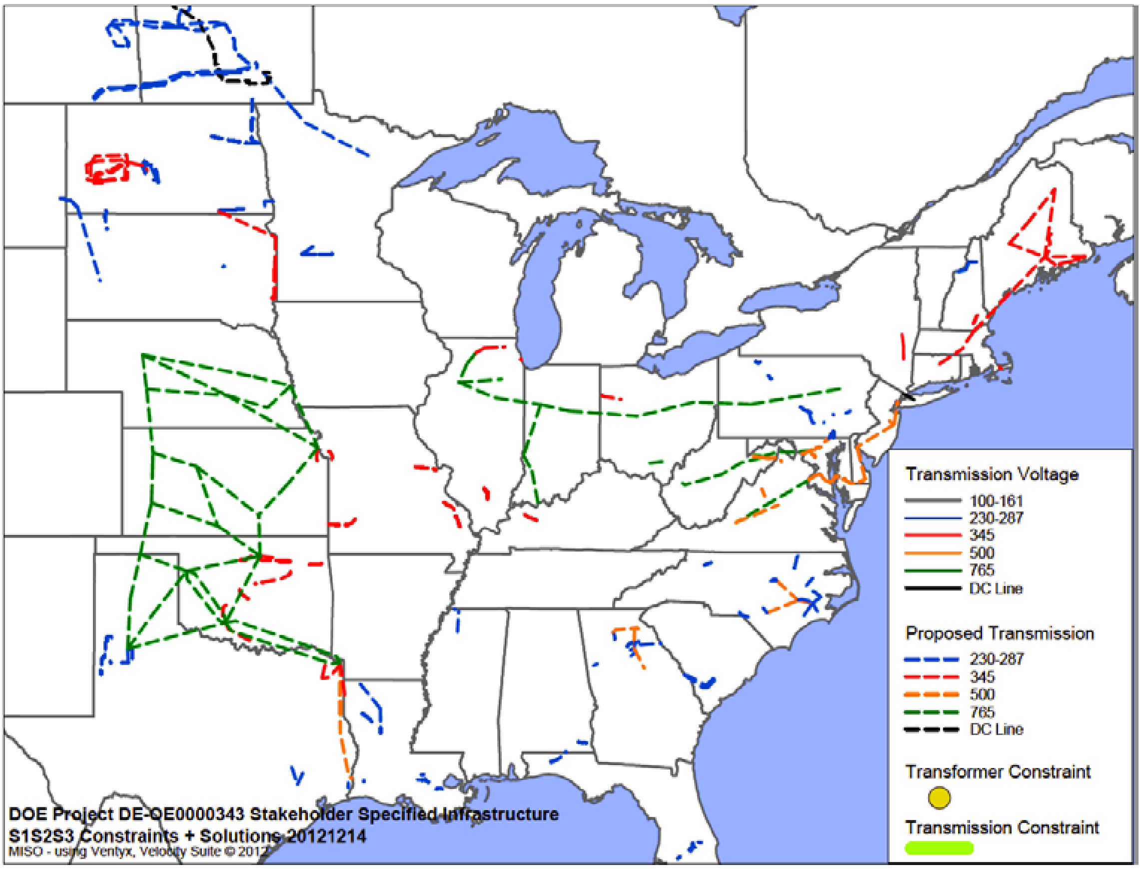


Figure ES-2. Scenario 2: NRPS/IR – New/Upgraded Transmission
Approximate 2030 O&M Costs - ($2010 Billions) cost for Scenario 2: $145.9 Billion
Overnight Capital Costs for Capital through 2030 ($2010 Billions) for Scenario 2: $771.9 Billion

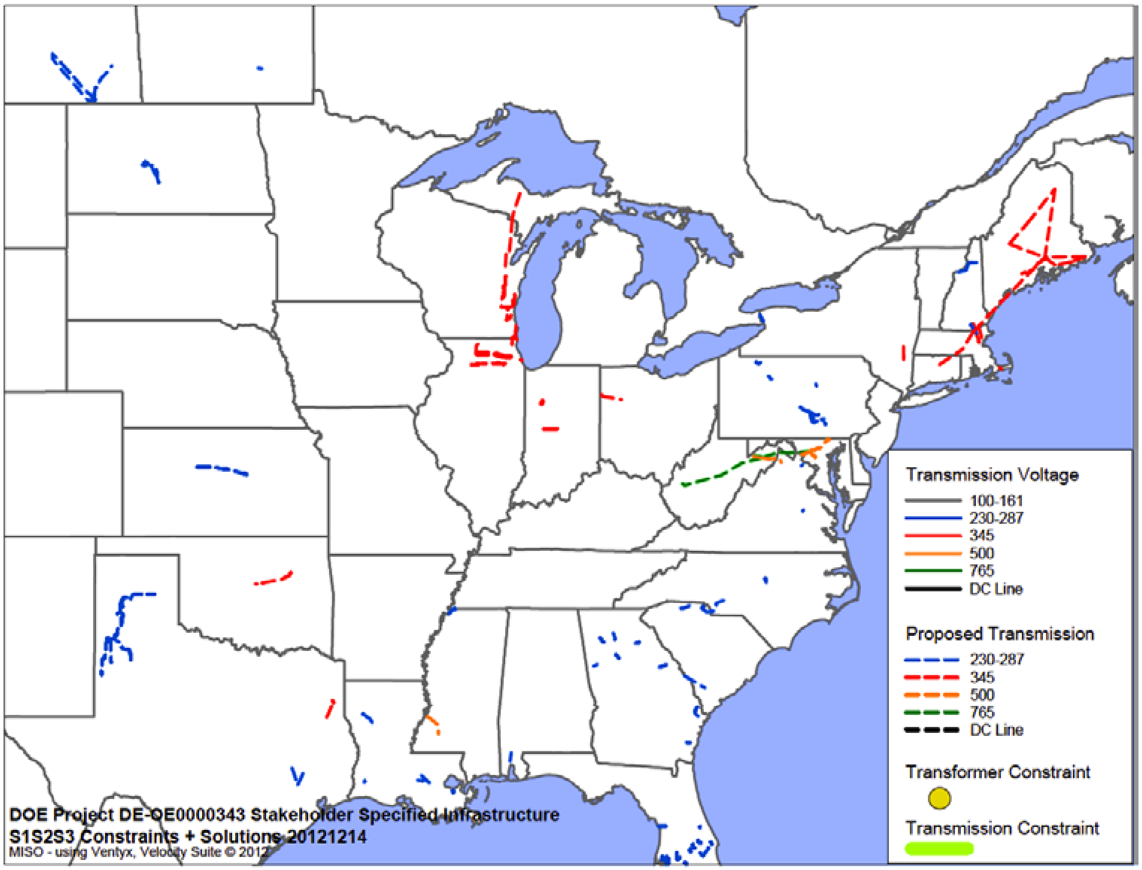


Figure ES-3. Scenario 3: Business as Usual – New/Upgraded Transmission
Approximate 2030 O&M Costs - ($2010 Billions) cost for Scenario 3: $154.4 Billion
Overnight Capital Costs for Capital through 2030 ($2010 Billions) for Scenario 3: $284.6 Billion

Scenario 1, with its elimination of virtually all coal plants, inclusion of over 215 GW of wind in Nebraska, the MISO region and the SPP region, and use of 152 GW of Demand Response, needed the largest transmission buildout to meet the policy objectives. Scenario 2 with a National Renewable Portfolio Standard that was implemented within regions needed a more moderate amount of transmission added and Scenario 3, Business as Usual, required the least amount of transmission added of the three scenarios.

The cost estimates in the project are based on a variety of generalized assumptions and are only broadly indicative on a relative basis between the futures. The analysis did not include social benefits and costs that would arise from the different policies modeled. Also not included in the above are costs for:

1. Lower voltage transmission projects

2. Stakeholder Specified Infrastructure (SSI) generation and transmission projects (common to all three scenarios)

3. Generation interconnection costs not included in the overlays, i.e., the generator step-up and the lead lines to the first breaker – the costs for the generator interconnection overlays are included

4. Generation deactivation/decommissioning

5. Capital costs for existing units

6. Transmission O&M.

MTO utilities continue to participate directly in the EIPC effort representing our customer's interests, and MISO participates as a Planning Authority, on behalf of utilities in the MISO area. More information about the EIPC effort can be found at the link below.

http://www.eipconline.com

3.5.2 NERC Facility Ratings Alert

The North American Electric Reliability Corporation (NERC) is requiring Transmission Owners and Generator Owners of bulk electric system facilities across the country, including those joining in this Biennial Report, to review their current facility ratings methodology for their transmission lines. Each owner must verify that the methodology used is based on actual field conditions and determine if their ratings methodology will produce appropriate ratings when considering differences between design and field conditions. For additional information see:

http://www.nerc.com/pa/rrm/bpsa/Pages/Facility-Ratings-Alert.aspx

By January 18, 2011, these Transmission Owners were required to submit to NERC their plans to complete such an assessment of all their transmission lines, with the highest priority lines to be assessed by December 31, 2011, medium priority lines by December 31, 2012, and the lowest priority by December 31, 2013. The MTO utilities have complied with the December 2011 deadline and will make the 2013 deadline. For information on NERC line prioritization categories follow this link:

http://www.nerc.com/docs/alerts/Assessment_Plan_Review_Criteria_20110511.pdf

At the conclusion of each year, each Transmission Owner and Generator Owner must report to its Regional Entity a summary of the assessments and identification of all transmission facilities where as-built conditions are different from design conditions (resulting in incorrect ratings) and their associated mitigation timelines. For the MTO utilities, the Regional Entity is the Midwest Reliability Organization (MRO). Remediation is expected to be complete within one year from identification of an issue or on a schedule approved by the Regional Entity if longer than a year. Owners are also expected to coordinate with their respective Reliability Coordinator (RC) and Planning Authority (PA) to coordinate interim mitigation strategies. For MTO who are MISO members, the Midcontinent Independent System Operator (MISO) serves as the RC and PA. For the MTO members who are not MISO members, the Mid-Continent Area Power Pool (MAPP) serves as the PA and MISO would serve as the RC.

If discrepancies are found, various alternative methods could be used for remediation. These could be as simple as de-rating the transmission line, upgrading its capacity by increasing clearance, reconductoring or rebuilding the line or construction of new transmission facilities to reduce loading on the identified transmission element. The alternative of choice will be dependent the outcome of an engineering analysis that will take into account future expected transmission needs and cost.

3.5.3 Eastern Renewable Generation Integration Study

The National Renewable Energy Laboratory (NREL) is undertaking the Eastern Renewable Generation Integration Study (ERGIS) which is a follow-up to previous wind integration studies including the Eastern Wind Integration Transmission Study (EWITS). The study objective of ERGIS is to explore transmission grid planning and operations with significant amount of installed renewable generation in order to answer new questions/concerns such as regional and inter-regional impacts as well as mitigation. This study will specifically determine the operational impact of 30% wind and solar penetration on the Eastern Interconnection at a sub-hourly resolution and to evaluate the efficacy of mitigation options in managing variability and uncertainty in the electric power system. The transmission options, developed in earlier studies, including EIPC, will be refined and used in this study assumption. New study tools are being used to better simulate real time system operations. The Technical Review Committee includes a the participation of a cross section of industry stakeholders.

3.6 MAPP Load & Capability Report

Presently, PUC rules require the utilities to include in the Biennial Report a copy of “the most recent regional load and capability report of the Mid-Continent Area Power Pool” (MAPP). Minn. Rules part 7848.1300, item B. MAPP, however, has not prepared a Load & Capability Report since May 2009. There is nothing to report. The Midcontinent Independent Transmission Operator (MISO) is now responsible for most of the planning that occurs in this part of the country, as has been described elsewhere in this report, and the MISO Transmission Expansion Plan (MTEP) report has become the place to find out information about most transmission plans in Minnesota and the region.

4.0 Public Participation

4.1 General Guide to Utility Public Outreach

The Public Utilities Commission has consistently emphasized the importance of providing the public and local government officials with an opportunity to participate in transmission planning. For several years, in accordance with PUC rule part 7848.0900, the utilities held yearly public meetings across the state in each transmission planning zone to advise the public of potential transmission projects and to solicit input regarding development of alternative solutions to various inadequacies. These public meetings were poorly attended, with little input being offered. As a result, in 2008, in its Order approving the 2007 Biennial Report, the PUC granted a variance from the obligation to hold these zonal meetings. The PUC renewed the variance again in 2010 and 2012 in its Orders approving the 2009 and 2011 Biennial Reports. No zone-wide public meetings have been held since 2007.

Instead of these annual public meetings, other efforts have been undertaken to inform the public of ongoing transmission planning activities and to involve local government in the review of anticipated transmission projects. These efforts and activities have been described in previous biennial reports. They include maintaining a webpage (http://www.minnelectrans.com.) that identifies ongoing planning studies and provides links to past biennial reports. In November 2011 the MTO held a webinar explaining how transmission planning is conducted and describing the projects identified in the 2011 Biennial Report. The MTO utilities frequently meet with local government officials to discuss potential projects in their vicinities. Of course, once a project develops to the stage where a certificate of need or route permit is applied for, notice is given to a wide range of persons in accordance with PUC requirements.

In its May 18, 2012, Order approving the 2011 Biennial Report, the Commission specifically directed the MTO to undertake certain actions to improve communication with the public and local government. The Commission directed the MTO to implement the following:

- Continue to work to improve its transmission planning webpage, so as to provide a way for interested people to learn about ongoing and scheduled transmission planning studies, and subscribe to receive notices regarding studies listed on the webpage.
- Secure input on transmission planning issues from local government.

The Commission also directed the MTO to report on its activities to involve the public and local government in its transmission planning in the 2013 Biennial Report. Those efforts and activities are described below.

4.2 Transmission Planning

Before turning to specific efforts designed to solicit input from the general public and local governmental officials, it is helpful to describe how transmission planning is conducted by utilities. Much of this discussion has been included in previous biennial reports.

4.2.1 MISO Planning

For those utilities that are members of the Midcontinent Independent Transmission System Operator (MISO), much of the transmission planning that is undertaken is conducted through that organization. MISO conducts an annual transmission planning process called the MISO Transmission Expansion Planning (MTEP) process. This process begins in September, when utility members submit their newly proposed projects to MISO for planning purposes and for development of the annual MTEP report. MISO normally takes until the following July to complete the draft MTEP Report, which is usually approved by the MISO Board in December. The MISO process is explained in more detail in Chapter 6.

During this yearly planning process, MISO provides ample opportunities for the public to be involved. Interested persons and groups are able to log onto the MISO webpage and register their names to get notice about future planning meetings. MISO holds Subregional Planning Meetings (SPMs) and establishes Technical Review Groups (TRGs) that also hold meetings. These meetings are normally open to the public. Individuals can subscribe to the mailing lists maintained by the Planning Advisory Committee (PAC), which conducts high-level planning discussions, and the Planning Subcommittee (PSC), which carries out more technical evaluations and conducts more detailed study efforts about specific projects. Even if an individual does not register to get notice of a particular PAC or PSC meeting, notice of all meetings is published on the MISO website. https://www.misoenergy.org

4.2.2 MAPP Planning

Those utilities that are not part of MISO also provide opportunities for the public to be involved in their transmission planning activities through the Midcontinent Area Power Pool (MAPP). The MAPP utilities conduct their regional transmission planning through a group of engineers who make up the MAPP Transmission Planning Committee (TPC). The TPC is responsible for developing an annual MAPP regional transmission plan.

The process for developing the MAPP Regional Plan begins with the submittal of the Member Plans to the TPC through the MAPP Regional Planning Group (RPG). The MAPP Regional Plan integrates the transmission plans developed by the individual MAPP Transmission Owning Members and the RPG to meet the transmission needs in the MAPP Region of the Members and other Stakeholders on a consistent, reliable, environmentally acceptable, and economic basis. The TPC develops and approves a coordinated transmission plan, including alternatives, for the ensuing 10 years, or other planning periods specified by NERC, for all transmission facilities owned by the MAPP utilities in the MAPP Planning Region.

During this annual planning process, MAPP provides various opportunities for stakeholder involvement. Interested persons and groups are able to log onto the MAPP webpage to get notice about future planning meetings of the RPG and TPC. MAPP holds RPG and TPC meetings that are open to stakeholders. Individuals can also subscribe to the RPG mailing list for information on RPG planning meetings. The TPC is also responsible for interregional coordination through collaboration with neighboring regions.

4.3 MTO Website

The Minnesota Transmission Owners have maintained a website (www.minnelectrans.com) for several years now, on which interested persons can obtain various information about ongoing transmission planning efforts. Every Biennial Report, for example, is available on that website, as are many different transmission-related studies.

The Minnelectrans.com website is updated in each year the report is published, and information regarding webcasts and/or meetings discussing the report are posted on the home page. Additionally, there is a contact form where visitors can ask questions of utilities about projects. In 2012 and 2013 a total of six questions or comments were submitted, three of which were about projects in progress around the state. One question was from a member of the media; one question was from a realtor; and one question was from a landowner. Contact information for each project was provided to each person who submitted a question. The remaining comments were from an academic researcher and salespeople.

For the 2013 report, Minnesota Transmission Owners have developed two short videos detailing items of interest to the general public. The videos will be posted on the Minnelectrans.com website. One video describes generally how the transmission planning process is done at utilities in Minnesota. The second video describes how to read the Biennial Transmission Report and engage with transmission owning utilities.

4.4 Local Government

The Public Utilities Commission directed the MTO to include a separate section in the 2013 Biennial Report discussing outreach efforts to secure input from local governmental units. This section describes those efforts.

The MTO utilities involve local government at an early stage in the development of plans for new and upgraded transmission facilities, particularly with respect to projects designed to address local load serving issues and weather-related matters. This usually involves direct contact with both the staff of local government and with elected officials. Face-to-face meetings are often held between utility staff and city and county representatives. Open houses, to which both local representatives and the general public are invited to attend, are frequently held in the local area. These meetings and open houses often occur long before a utility has identified a specific project or route and developed a certificate of need application or a route permit application.

The reality is, however, that both the general public and local governmental officials do not generally get involved in the actual planning for new transmission facilities. Transmission planning is complex and technical. It involves electrical engineers and other trained utility experts. Planning often involves issues not directly affecting a local area that may be impacted by a new transmission line if a new line were to be proposed. It is only when a specific project is selected, with potential routes identified, that landowners and local officials begin to get involved.

Perhaps a good way to illustrate the efforts the utilities undertake to involve local government and the general public in the development of transmission projects is to describe in general terms how two of the utilities proceed to ensure that opportunities for local input are provided an early stage.

Minnesota Power. Besides participating in the open and transparent MISO transmission planning process, Minnesota Power has made a practice of conducting voluntary stakeholder outreach prior to moving forward with official permitting activities for transmission projects. In general, potentially affected landowners, local government units (LGU) and state and federal regulators will be invited to attend an open house meeting in the project area in advance of when Minnesota Power plans to actually submit the relevant permit applications for the project. This gives the public and LGUs the opportunity to hear from Minnesota Power about the need for, scope, and schedule of the project, and to provide feedback and insight about routing and siting issues particular to their area. For larger, more complex projects that impact a broader geographical area, multiple open house meetings may be held.

East River Electric Power Cooperative. East River Electric Power Cooperative, (East River),which has most of its facilities in South Dakota, also employs significant efforts to involve the public and local officials. Even with the smaller projects East River undertakes and the less formal permitting procedures required of the Cooperative in South Dakota, extensive efforts are made to keep the public advised and to solicit input from local officials and landowners.

East River has a multifaceted public and governmental outreach effort with current and proposed projects. At an initial stage in the development of a project, East River contacts local governmental officials in the area of the potential project to alert them about the project. Letters are also sent to landowners in the project area describing the project. Courthouse records are used to identify the landowners. The Cooperative includes a map of the proposed project and a picture of the type of pole that will be used with the notification letter. It's only after notifying the landowners does East River begin to focus on obtaining permits from local county and city officials, each with different guidelines and following different timelines. After the project notification letter has been sent and local officials have been contacted, a public informational meeting may be held. As the line route begins to develop, the Cooperative will visit with local officials and landowners in person about acquiring an easement to place the poles on their land. East River takes pride in providing transparency with proposed and current projects. East River believes that working with all interested entities during project development is more efficient than waiting until the end when changes are more difficult. After easement acquisition is complete, permits are finalized.

It is also informative to select a few specific projects and identify the efforts the utilities undertook in those matters to involve local government and the public throughout development of the projects. These examples involve large projects and not every project includes such comprehensive local governmental involvement, of course, but they do illustrate the commitment of the utilities to ensure that in all cases local government and the general public are aware of ongoing projects and have opportunities to express their concerns and desires.

4.4.1 Bemidji – Grand Rapids 230 kV line. Tracking Number 2005-NW-N2 and 2005-CX-1

A good example of the efforts undertaken by the utilities to involve local government in the project is the new 230 kV line between Bemidji and Grand Rapids. Tracking Number 2005-NW-N2 and 2005-CX-1. This line was actually put into operation in November of 2012.

The following bullet points represent the major meetings/filings that were held for the project, although the list is not complete. Other agency and public meetings were held as well.

- April 10, 2006 - Meetings with Leech Lake Reservation Business Committee Chairman Goggleye and other members began.
- April 10, 2006 - Informational meetings began with Leech Lake Band of Ojibwa (LLBO) Department of Resource Management, Tribal Historic Preservation Officer (TIHPO), and the Bureau of Indian Affairs (BIA). Follow up meetings occurred on: April 18, 2006 – October 27, 2006 - March 5, 2007 - April 4, 2007 - April 5, 2007 - April 26, 2007 - May 17, 2007 - June 27, 2007 - June 28, 2007 - July 13, 2007 - July 25, 2007 - July 30, 2007 - September 10, 2007 - September 11, 2007 - September 17, 2007 and October 9, 2007
- April 18, 2006 - Information meetings began with U.S. Forest Service, Chippewa National Forest, Army Corp of Engineers, Fish and Wildlife Service, and Rural Utilities Services. Follow up meetings on October 24, 2006 – December 14, 2006 and January 27, 2007
- October 11, 2007 - Informational meetings began with Minnesota Department of Natural Resources, Minnesota Department of Transportation and other state agencies. Follow up meetings on November 20, 2007 – December 21, 2007 (MN Department of Natural Resources) and April 10, 2008 (MN Department of Transportation)
  - June 26-28, 2007 - Voluntary open house meetings in Bemidji, Cass Lake, and Deer River
  - Summer 2007 LIC meetings at each of the 22 Local Indian Councils
  - September, 2007 Open meeting with meal for LLBO tribal members at Cass Lake
- September 11, 2007 - Neighboring electric utilities and pipeline companies. Follow up meeting on October 26, 2007
- October 9-11, 2007 - Voluntary open house meetings in Bemidji, Cass Lake, Deer River
- March 17, 2008 - Certificate of Need filing, notice ads and letters sent to agencies and landowners in the project's proposed corridors.

- June 4, 2008 - Route Permit filed with MPUC, notice ads published in 10 local newspapers and letters sent to agencies and landowners in project's proposed corridors.
- July 2, 2008 – Notice of an appointment of the BGR Advisory Task Force to be held July 14 in Cass Lake.
- August 11-14, 2008 Public scoping meetings in Blackduck, Cass Lake, Deer River, and Bemidji.
- July 2009 - MPUC granted a Certificate of Need for the project.
- February 24 2010, Notice of Draft EIS availability sent out.
- March 16-18, 2010, March 16-18, 2010, Public information meetings in Bemidji, Deer River, and Cass Lake. Public meeting in Cass Lake drew larger than usual crowd, Elizabeth Sherman and about a dozen Loving Mother Earth supporters demonstrated prior to the meeting
- April 5, 2010 – Notice of Public Hearing for Route Permit sent out.
- April 21-23, 2010, Hearings held in Blackduck, Bemidji, Cass Lake, and Deer River before administrative law judge.
- October 2010 - MPUC granted Route Permit

4.4.2 Great Northern Transmission Line (Tracking No. 2013-NE-N13)

A recently identified large transmission project – the Great Northern Transmission Line – which is still in early stages of development, provides an excellent example of outreach efforts being undertaken by Minnesota Power to involve the public and local government.

To create an upfront, engaging, and transparent agency and stakeholder outreach program for the Great Northern Transmission Line, a full-scale outreach strategy plan was developed and begun starting in August 2012. These efforts predate any actual filing with state or federal government for with the goal to include agency and public comments and concerns early in the routing process and prior to the regulatory processes. The following information provides an overview of the key outreach tools and meeting milestones for the Great Northern Transmission Line Project.

To provide consistent and ongoing communication and opportunities for comment submittals, the Great Northern Transmission Line Project Team launched a Project website (www.greatnortherntransmissionline.com), Project hotline (877.657.9934), and Project email (info@greatnortherntransmissionline.com). These tools are available for agency and public use and updated on a regular basis. The interactive maps and detailed aerial maps have been the most popular pages on the Project website to date. With a variety of comment tools, the Team has received 156 (63 Website, 24 Hotline, 69 Email) comments, in addition to extensive comments received at the public meetings described below. All of these comments received electronically are personally responded to via email, mail or phone call in a timely manner to address each individual's comments or questions.

Since the initial Project Study Area incorporated approximately 20,000 squares miles, the public outreach strategy included a round of 11 stakeholder workshops across the Study Area. Invitations were mailed to state and federal agencies, local officials, non-government organizations, and tribes to participate and learn about the Project, ask questions, and provide input regarding routing opportunities and constraints within their area. Following these meetings, the Team was able to use input gathered at the stakeholder workshops along with environmental and engineering data to reduce the broad Study Area to several general Corridors.

As the Team continued to refine the Corridors into Route Alternatives, two rounds of public open house meetings were held to educate the public on the purpose and need of the Project, answer questions, and gather input on routing opportunities and constraints in their area. In October 2012 and April 2013, a total of 28 open house meetings were held throughout the Corridors and Route Alternatives with a total of 1,330 open house meeting attendees. In addition to the in-person open houses, online public meetings were hosted through the Project website and 349 visitors received project information online through video clips, maps, and information boards.

This extensive outreach strategy has allowed the Project Team to develop relationships with the agencies, local officials and landowners potentially affected by the Project. The upfront and transparent process has been appreciated by all stakeholders. The Great Northern Transmission Line Project Team plans to continue these outreach efforts with another round of voluntary open house meetings scheduled in September 2013 to collect additional input before two or more routes are selected for inclusion in the Route Permit Application, to be submitted to the Minnesota Public Utilities Commission in early 2014.

4.4.3 ITC Midwest Minnesota-Iowa 345 kV Transmission Project (Tracking No. 2013-SW-N4)

This is a new project first reported in the 2013 Biennial Report that is being developed by ITC Midwest, LLC. ITC Midwest first developed a large Study Area involving the counties of Jackson, Martin, and Faribault. Following development of the Study Area, on June 8, 2012, ITC sent a letter with a map to twenty-five federal, state, county, and local agencies and officials with jurisdiction within the Study Area identifying the proposed line and requesting feedback on potential resources and concerns to route development within the Study Area. The Study Area map provided with the letters not only identified possible routing options but also identified the proposed substation locations.

ITC Midwest received written replies from four agencies and received an additional two requests for additional GIS data to assist the agencies in their review. As a follow-up to the inquiry letters and to obtain additional information about potential routing concerns, ITC Midwest requested meetings with officials from Jackson, Martin, and Faribault counties. These meetings provided an opportunity to introduce the Project in greater detail and to obtain feedback from county representatives regarding potential resources and concerns unique to the area and to residents and landowners of each county. Additionally, the meetings provided an opportunity to discuss and obtain additional county-specific data that was available to increase the existing GIS database developed for the Project.

A total of three meetings with the Study Area counties (Jackson, Martin, and Faribault) were held on July 9, 2012. A range of staff members was present at each meeting, including county commissioners, planning and zoning staff, drainage administrators and inspectors, economic development staff, and county highway engineers. ITC Midwest provided an overview of the route selection process and provided details on the project schedule and plans for open houses in each county. ITC Midwest staff received information and GIS data on potential routing constraints and opportunities unique to each county.

ITC Midwest staff conducted six public open houses during the week of September 10, 2012. The meetings included two each in Jackson, Faribault, and Martin counties. ITC Midwest sent approximately 3,700 letters inviting residents, landowners, public officials, and other potential stakeholders to the meetings. ITC Midwest staff presented large-scale maps showing the initial Route Network developed as a result of agency responses, county meetings, site reconnaissance, and the GIS database developed for the Project. The open houses included nine separate information booths ranging in focus from routing, design and construction, regulatory, real estate/right-of-way and environmental/EMF.

A total of 445 individuals attended the meetings. In addition to extensive verbal comments, ITC Midwest received a total of 114 formal written comments. Landowner feedback from these open houses included comments and concerns for proximity to municipal airports, agricultural infrastructure (e.g., center-pivot irrigation systems), wind farm development, land use and agricultural practices, preference to utilize field lines, and other route development considerations. Between the public open houses, ITC Midwest staff also met with representatives from Jackson Municipal Airport to discuss potential routing constraints due to future airport expansion plans.

4.5 Webinar

4.5.1 2011 Webinar

The Minnesota Transmission Owners held an online webinar on November 18, 2011, utilizing the GoToMeeting.com video conferencing software that allows viewers join a seminar free of charge in real time via the Internet. The webinar was advertised in the statewide edition of the Minneapolis Star Tribune and notice of the Webinar was posted on the minnelectrans website in advance.

During the webcast utility employees discussed the transmission planning process in general, presented an overview of the transmission system in Minnesota, and discussed in some detail each of the projects identified in the 2011 Biennial Transmission Projects Report by zone. The utilities described how information about each of the proposed projects could be found in the

MTEP reports and explained how to navigate the MISO website to find the various reports. Participants were also able to ask questions by submitting emails to the presenters.

Fewer than 20 people participated in the webcast, including a few people from the Department of Commerce. Many of the participants were employees of various utilities.

4.5.2 2013 Webinar

After the 2013 Biennial Transmission Report is filed with the Minnesota Public Utilities Commission on November 1, the MTO will host another webinar to discuss transmission planning in the state and to review the 2013 Report. The webinar will be promoted on the Minnelectrans.com home page, and an advertisement will be placed in a statewide edition of the Minneapolis Star Tribune newspaper. It is expected the webinar will be held in mid-November. During the webinar, utility representatives will be available to discuss any of the projects identified in the Biennial Report, to describe ongoing transmission planning studies, and to answer any questions participants may have.

5.0 Transmission Planning Zones

5.1 Introduction

Minnesota has been divided geographically into the following six Transmission Planning Zones:

- Northwest Zone
- Northeast Zone
- West Central Zone
- Twin Cities Zone
- Southwest Zone
- Southeast Zone

The map below shows the six Zones.

Chapter 5 of the 2013 Report describes each of the Transmission Planning Zones in the state. The counties in the zone and the major population centers are identified. The utilities that own high voltage transmission lines in the zone are listed. The zones have not changed over the years so the description below for each zone is essentially identical to what was provided in past reports, although any changes in the transmission system in a particular zone that occurred over the past two years are described in each section.

Transmission systems in one zone are highly interconnected with those in other zones and with regional transmission systems. A particular utility may own transmission facilities in a zone that is outside its exclusive service area, or where it has few or no retail customers. Different segments of the same transmission line may be owned and/or operated by different utilities. A transmission line may span more than one zone, and transmission projects may involve more than one zone.

Chapter 6 describes the needs for additional transmission facilities that have been identified for each zone. Chapter 7 contains additional information about each of the utilities filing this report, including their existing transmission lines.

5.2 Northwest Zone

The Northwest Planning Zone is located in northwestern Minnesota and is bounded by the North Dakota border to the west and the Canadian border to the north. The Northwest Planning Zone includes the counties of Becker, Beltrami, Clay, Clearwater, Kittson, Lake of the Woods, Mahnomen, Marshall, Norman, Otter Tail, Pennington, Polk, Red Lake, Roseau, and Wilkin.

Primary population centers within the Northwest Planning Zone (population greater than 10,000) include the cities of Bemidji, Fergus Falls, and Moorhead.

The following utilities own transmission facilities in the Northwest Zone:

- Great River Energy
- Minnkota Power Cooperative
- Missouri River Energy Services
- Otter Tail Power Company
- Xcel Energy

A major portion of the transmission system that serves the Northwest Planning Zone is located in eastern North Dakota. Four 230 kV lines and one 345 kV line reach from western North Dakota to substations in Drayton, Grand Forks, Fargo, and Wahpeton, North Dakota, along with a 230 kV line from Manitoba and a 230 kV line from South Dakota. Five 230 kV lines run from eastern North Dakota into Audubon, Moorhead, Fergus Falls, and Winger, Minnesota. These five lines then proceed through northwestern Minnesota and continue on to substations in west-central and northeastern Minnesota. Additionally, a 230 kV line from Manitoba to the Northeast Zone crosses the northeastern corner of this zone and provides power to local loads. The 230 kV system supports an extensive 115, 69, and 41.6 kV transmission system which delivers power to local loads.

The major change in the transmission system in the Northwest Zone since 2011 is the addition of a 230 kV line between Grand Rapids in the Northeast Zone and Bemidji in the Northwest Zone (a CapX2020 project). This line was energized in November 2012. This project has been referenced under Tracking Number 2005-NW-N2 and PUC Docket No. TL-07-1327.

Two new 345 kV lines which terminate on the North Dakota side of this zone are scheduled for completion in the 2014 – 2015 timeframe. The MPC Center – Grand Forks 345 kV project will be completed in early 2014 and will bring power from Center, North Dakota to Grand Forks, North Dakota. The CapX Fargo – St. Cloud 345 kV project will also be completed in the 2014 – 2015 timeframe and will transfer power between Fargo, North Dakota and the Twin Cities area.

Continued load growth in the northern part of this zone has led to the development of plans for a new 230 kV line from Winger to Thief River Falls. This line is reported under Tracking Number 2007-NW-N3.

5.3 Northeast Zone

The Northeast Planning Zone covers the area north of the Twin Cities suburban area to the Canadian border and from Lake Superior west to the Walker and Verndale areas. The zone includes the counties of Aitkin, Carlton, Cass, Cook, Crow Wing, Hubbard, Isanti, Itasca, Kanabec, Koochiching, Lake, Mille Lacs, Morrison, Pine, St. Louis, Todd, and Wadena counties.

The primary population centers in the Northeast Planning Zone include the cities of Brainerd, Cambridge, Cloquet, Duluth, Ely, Grand Rapids, Hermantown, Hibbing, International Falls, Little Falls, Long Prairie, Milaca, Park Rapids, Pine City, Princeton, Verndale, Virginia, and Walker.

The following utilities own transmission facilities in the Northeast Zone:

- American Transmission Company, LLC
- Great River Energy
- Minnkota Power Cooperative
- Minnesota Power
- Southern Minnesota Municipal Power Agency
- Xcel Energy

The only change in the transmission system in the Northeast Zone since 2011 is the addition of a 230 kV line between Grand Rapids in the Northeast Zone and Bemidji in the Northwest Zone. This line was placed in operation in November 2012. Tracking Number 2005-NW-N2 and PUC Docket No. TL-07-1327. Otherwise the description of transmission facilities in the zone included below is the same as what was in the 2011 Report.

The transmission system in the Northeast Planning Zone consists mainly of 230 kV, 138 kV and 115 kV lines that serve lower voltage systems comprised of 69 kV, 46 kV, 34.5 kV, 23 kV and 14 kV. American Transmission Company's 345 kV line runs between Duluth, Minnesota, and Wausau, Wisconsin. Also, a new 230 kV line between the Bemidji area in the Northwest Zone and the Grand Rapids area in the Northeast Zone (The Capx2020 Bemidji-Grand Rapids project) was completed in November 2012. The 345 kV and 230 kV system is used as an outlet for generation and to deliver power to the major load centers within the zone. From the regional load centers, 115 kV lines carry power to lower voltage substations where it is distributed to outlying areas. In a few instances, 230 kV lines serve this purpose.

A +/- 250 kV DC line owned by Minnesota Power runs from Center, North Dakota, to Duluth currently serves mainly as a generator outlet for lignite-fired generation located in North Dakota but could be used in the future to carry wind energy from the Dakotas to Minnesota.

5.4 West Central Zone

The West Central Transmission Planning Zone extends from Sherburne and Wright counties on the east, to Traverse and Big Stone counties on the west, bordered by Grant and Douglas counties on the north and Renville County to the south. The West Central Planning Zone includes the counties of Traverse, Big Stone, Lac qui Parle, Swift, Stevens, Grant, Douglas, Pope, Chippewa, Renville, Kandiyohi, Stearns, Meeker, McLeod, Wright, Sherburne, and Benton.

The primary population centers in the zone include the cities of Alexandria, Buffalo, Elk River, Glencoe, Hutchinson, Litchfield, Sartell, Sauk Rapids, St. Cloud, St. Michael, and Willmar.

The following utilities own transmission facilities in the West Central Zone:

- Great River Energy
- Hutchinson Utilities Commission
- Missouri River Energy Services
- Otter Tail Power Company
- Southern Minnesota Municipal Power Agency
- Willmar Municipal Utilities
- Xcel Energy

The major transmission activity in the West Central Zone is the construction of the CapX 2020 345 kV line between Monticello and Fargo, North Dakota, which is scheduled for completion in the 2014-2015 timeframe. Tracking Number 2005-CX-1.

This transmission system in the West Central Planning Zone is characterized by a 115 kV loop connecting Grant County – Alexandria – West St. Cloud – Paynesville – Willmar – Morris and back to Grant County. These 115 kV transmission lines provide a hub from which 69 kV transmission lines provide service to loads in the zone.

A 345 kV line from Sherburne County to St. Cloud and 115 kV and 230 kV lines from Monticello to St. Cloud provide the primary transmission supply to St. Cloud and much of the eastern half of this zone. Two 230 kV lines from Granite Falls – one to the Black Dog generating plant in the Twin Cities and one to Willmar – provide the main source in the southern part of the zone.

Demand in the St. Cloud area continues to grow and several individual projects are being considered to address the need for more power into this area. The new 345 kV line from Fargo to Monticello, which is under construction, is a significant part of the solution to transformer overloads and contingencies on the 69 kV system that are anticipated in the St. Cloud area. Portions of this line are now in service.

Some of the 69 kV network is becoming inadequate for supporting the growing load in the area between Alexandria and St. Cloud. Solutions to the 69 kV transmission inadequacies may involve construction of new 115 kV transmission lines. Therefore, any discussion about the inadequacy of the existing system must include an analysis of parts of the existing 69 kV transmission system.

5.5 Twin Cities Zone

The Twin Cities Planning Zone comprises the Twin Cities metropolitan area. It includes the counties of Anoka, Carver, Chisago, Dakota, Hennepin, Ramsey, Scott and Washington.

The following utilities own transmission facilities in the Twin Cities Zone:

- Great River Energy
- Xcel Energy

There are no major changes in the transmission facilities located in the Twin Cities Zone since 2011, although several projects are under review by the Public Utilities Commission.

The transmission system in the Twin Cities Planning Zone is characterized by a 345 kV double circuit loop around the core Twin Cities and first tier suburbs. Inside the 345 kV loop, a network of high capacity 115 kV lines serves the distribution substations. Outside the loop, a number of 115 kV lines extend outward from the Twin Cities with much of the local load serving accomplished via lower capacity, 69 kV transmission lines.

The GRE DC line and 345 kV circuits tie into the northwest side of the 345 kV loop and are dedicated to bringing generation to Twin Cities and Minnesota loads. Tie lines extend from the 345 kV loop to three 345 kV lines: one to eastern Wisconsin, one to southeast Iowa and one to southwest Iowa. The other tie is the Xcel Energy 500 kV line from Canada that is tied into the northeast side of the 345 kV loop.

Major generating plants are interconnected to the 345 kV transmission loop at the Sherburne County generating plant and the Monticello generating plant in the northwest, the Allen S. King plant in the northeast, and Prairie Island in the southeast. On the 115 kV transmission system in the Twin Cities Planning Zone there are three intermediate generating plants: Riverside (located in northeast Minneapolis), High Bridge (located in St. Paul), and Black Dog (located in north Burnsville). There are also two peaking generating plants – Blue Lake and Inver Hills – interconnected on the southeast and the southwest, respectively.

5.6 Southwest Zone

The Southwest Transmission Planning Zone is located in southwestern Minnesota and is generally bounded by the Iowa border on the south, Mankato on the east, Granite Falls on the north and the South Dakota border on the west. It includes the counties of Brown, Cottonwood, Jackson, Lincoln, Lyon, Martin, Murray, Pipestone, Redwood, Rock, Watonwan, and Yellow Medicine.

The primary population centers in the Southwest Zone include the cities of Fairmont, Granite Falls, Jackson, Marshall, New Ulm, Pipestone, St. James, and Worthington.

The following utilities own transmission facilities in the Southwest Zone:

- ITC Midwest LLC
- East River Electric Power Cooperative
- Great River Energy
- L&O Power Cooperative
- Marshall Municipal Utilities
- Missouri River Energy Services
- Otter Tail Power Company
- Southern Minnesota Municipal Power Agency
- Xcel Energy

There are no major changes in the transmission facilities located in the Southwest Zone since 2011.

The transmission system in the Southwest Zone consists mainly of two 345 kV transmission lines, one beginning at Split Rock Substation near Sioux Falls and traveling to Lakefield Junction and the second traveling from Mankato, through Lakefield Junction and south into Iowa. Lakefield Junction serves as a major hub for several 161 kV lines throughout the zone. A number of 115 kV lines also provide transmission service to loads in the area, particularly the large municipal load at Marshall. Much of the load in the southwestern zone is served by 69 kV transmission lines which have sources from 115/69 kV or 161/69 kV substations.

The 115 kV lines also provide transmission service for the wind generation that is occurring along Buffalo Ridge. The transmission system in this zone has changed significantly in recent years with new transmission additions to enable additional generation delivery. Continuing these changes, the system will soon be enhanced by the addition of the Twin Cities – Brookings 345 kV transmission line to provide additional outlet for the wind generation in the Southwest Zone. In addition to enabling additional delivery of wind generation, these lines will provide opportunities for new transmission substations to improve the load serving capability of the underlying transmission system.

5.7 Southeast Zone

The Southeast Planning Zone includes Blue Earth, Dodge, Faribault, Fillmore, Freeborn, Goodhue, Houston, Le Sueur, Mower, Nicollet, Olmsted, Rice, Sibley, Steele, Wabasha, Waseca, and Winona Counties. The zone is bordered by the State of Iowa to the south, the Mississippi River to the east, the Twin Cities Planning Zone and West Central Planning Zone to the north, and the Southwest Planning Zone to the west.

The primary population centers in the zone include the cities of Albert Lea, Austin, Faribault, Mankato, North Mankato, Northfield, Owatonna, Red Wing, Rochester, and Winona.

The following utilities own transmission facilities in the Southeast Zone:

- Dairyland Power Cooperative
- Great River Energy
- ITC Midwest LLC
- Rochester Public Utilities
- Southern Minnesota Municipal Power Agency
- Xcel Energy

There are no major changes in the transmission facilities located in the Southeast Zone since 2011, although construction is underway on the new 345 kV CapX line between the Twin Cities and La Crosse, Wisconsin (Tracking Number 2005-CX-3).

The transmission system in the Southeast Planning Zone consists of 345 kV, 161 kV, 115 kV and 69 kV lines that serve lower voltage distribution systems. The 345 kV system is used to import power to the Southeast Planning Zone for lower voltage load service from generation stations outside of the area. The 345 kV system also allows the seasonal and economic exchange of power from Minnesota to the east and south from large generation stations that are located within and outside of the zone. The 161 kV and 115 kV systems are used to carry power from the 345 kV system and from local generation sites to the major load centers within the zone. From the regional load centers and smaller local generation sites, 69 kV lines are used for load service to the outlying areas of the Southeast Planning Zone.

6.0 Needs

6.1 Introduction

Chapter 6 contains information on each of the present and reasonably foreseeable future inadequacies that have been identified in the six transmission zones. For each zone, a table of present inadequacies is first presented, in order of when the inadequacy was first identified, so the older inadequacies are listed first. This table is followed in a separate section with a table of completed projects that have been removed from the open list. These completed projects have been removed because the project was completed over the past two years or because changed circumstances have eliminated the need for the project.

The following describes the information that is reported in the tables for each zone.

6.1.1 Needed Projects

The table for Needed Projects contains the following columns:

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe

MPUC Tracking Number

The first column in the table is labeled “MPUC Tracking Number.” Each inadequacy is assigned a Tracking Number. This numbering system was created in 2005 and has been utilized in every report since. The Tracking Number has three parts to it: the year the inadequacy was first reported, the zone in which it occurs, and a chronological number assigned in no particular order. Tracking Number 2013-NE-N1, for example, indicates that this matter is first reported in the 2013 Report and is an inadequacy in the Northeast Zone. An inadequacy with a Tracking Number beginning with 2007, on the other hand, was first identified in the 2007 Report.

This column in the tables also contains in italics a name for each Tracking Number Project.

MTEP Year/App

The second column contains a reference to a MISO Transmission Expansion Plan (MTEP) Report and an Appendix in the report. The MTEP Report is prepared annually by the Midcontinent Independent System Operator (MISO) and each utility that is a member of MISO must participate in the MTEP process. Each report is referred to by the year it is adopted. Thus, the most recent report is MTEP13. Additional information about the MISO planning process and the MTEP reports is included in section 3.3.1 of this Biennial Report, and an explanation of how to find a particular MTEP Report and an Appendix is provided later in this section

MTEP Project Number

The third column of the table provides a Project Number assigned by MISO for each project. This Project Number is important for finding a particular project in the appropriate MTEP Report.

CON?

The PUC rules (Minn. Rules part 7848.1300, item M) state that the biennial report shall contain an approximate timeframe for filing a certificate of need application for any projects identified that are large enough to require a certificate of need. This column provides a simple "Yes" or "No" indication of whether a CON is required. The timing of the filing for the CON is determined by the fact that either an application has already been filed, in which case a PUC Docket Number is provided in the last column, or the timeframe set forth in the last column for completion of the project will be an indication of when an application for a CON has to be filed. If a PUC Docket Number is given, that docket can be checked to determine whether the CON has already been issued by the Commission.

Utility

This column simply identifies the utility or utilities that are involved in the project.

Description and Timeframe

The last column sets forth a brief explanation of what the project entails. More detailed information is available by consulting the MTEP Report and Appendix that are listed for the project. If a PUC Docket Number for a certificate of need or a route permit has been established, that information will also be found in this column. Finally, a timeframe for completion of the project is indicated.

6.1.2 Completed Projects

The table for Completed Projects is essentially the same as the table for Needed Projects described above. The only difference is that the date the project was completed is provided in the last column. If a certificate of need or a route permit was required from the Public Utilities Commission, or both, the docket numbers are provided in the last column.

MPUC Tracking Number	MTEP Year/ App	MTEP Project Number	CON	Utility	Description	Date Completed PUC Docket

6.1.3 The MISO Planning Process

As mentioned above most of the transmission planning conducted by Minnesota utilities is done through the Midcontinent Independent System Operator planning process, which results in the development of a Midcontinent Transmission Expansion Plan (MTEP) Report each year.

MISO Members

Not all transmission-owning utilities in Minnesota are members of MISO. The following utilities are members of MISO and will be relying on the MTEP Report to provide the necessary information about the inadequacies they have identified: American Transmission Company (ATC), Central Minnesota Municipal Power Agency (CMMPA), Dairyland Power Cooperative (DPC), Hutchinson Utilities Commission (HUC), Great River Energy (GRE), ITC Midwest (ITCM), Minnesota Power (MP), Missouri River Energy Services (MRES), Northern States Power Company (XEL), Otter Tail Power Company (OTP) and Southern Minnesota Municipal Power Agency (SMP).

Non-MISO Members

The following utilities are not members of MISO: East River Electric Power Cooperative (EREPC), L&O Power Cooperative (L&O), Marshall Municipal Utilities (MMU), Minnkota Power Cooperative (MPC), Rochester Public Utilities (RPU), and Willmar Municipal Utilities (WMU).

For those utilities that are joining in the submission of this Report who are not members of MISO, complete information about the inadequacy is included in this document. However, there is only one inadequacy to report for a non-MISO member, and that is Tracking Number 2011-NW-N5, a project in the Northwest Zone being undertaken by Minnkota Power Cooperative. Joint projects between MISO and non-MISO utilities are reported by the MISO members and references to the appropriate MTEP Report are provided.

The MTEP Report

The latest MTEP Reports are available on the MISO webpage at:

http://www.misoenergy.org (Click on "Planning.")

Each of the MTEP Reports separates transmission projects into three categories and lists them in Appendices as follows:

Appendix A – Projects recommended for approval,
Appendix B – Projects with documented need and effectiveness, and
Appendix C – Projects in review and conceptual projects.

Generally, when projects are first identified, they are listed in Appendix C, and then they move up to Appendix B and to Appendix A as they are further studied and ultimately brought forth for construction. Some projects never advance to the final stage of actually being approved and constructed.

The MTEP process is ongoing at all times at MISO. Generally utilities submit a list of their newly proposed projects in September. MISO staff evaluates these projects over the next several months, and prepares a draft of the annual MTEP Report around July of the following year. After review by utilities and other interested parties, the MISO board of directors usually approves the report in December. The process continues with another report finalized the following December. The MTEP 13 Report should be approved by the MISO Board of Directors in December of this year.

The MTEP Report is an excellent source of information about ongoing transmission studies and projects in Minnesota and throughout a wide area of the country.

- The MTEP Report is prepared annually so it provides more timely information. The Biennial Report is prepared every other year.
- The MISO planning process is comprehensive. MISO considers all regional transmission issues, not just Minnesota transmission issues.
- MISO conducts an independent analysis of all projects to confirm the benefits stated by the project sponsor. This adds further verification of the benefits of projects.
- MISO holds various planning meetings during the year at which stakeholders can have input into the planning process so there are more frequent opportunities for input (see next paragraph.)
- All completed projects are listed on the MISO webpage.
- Not duplicating the MTEP Report will save ratepayers money. It is costly to require the utilities to redo all the information that is found in the MTEP Report.

Participating in Meetings

Throughout each MTEP cycle, meetings are conducted to help projects progress and to keep stakeholders informed. Importantly, MISO provides numerous opportunities for the utilities, interested persons, and the general public to keep advised of these proceedings and to actually participate in transmission planning discussions. Anyone interested in the annual planning process can contact MISO at clientrelations@misoenergy.org and arrange to get information in the future. Anyone can subscribe to mailing lists for Planning Advisory Committee and Planning Subcommittee meetings.

Subscribing to Mailing Lists

- Planning Advisory Committee (PAC) - The Planning Advisory Committee conducts high level discussions about broad transmission issues. Learn more and sign up for the mailing list at:

  https://www.misoenergy.org/StakeholderCenter/CommitteesWorkGroupsTaskForces/PAC/Pages/home.aspx

- Planning Subcommittee (PSC) – The Planning Subcommittee conducts more specific studies and addresses technical issues. Learn more and sign up for the mailing list at:

  https://www.misoenergy.org/StakeholderCenter/CommitteesWorkGroupsTaskForces/PSC/Pages/home.aspx

6.2 Finding Information about Specific Projects

Since all but one of the inadequacies identified in this 2013 Biennial Report are by utilities that are MISO members, information about the projects will be found in the MTEP Reports, and it is necessary to describe how to actually find that information. The following discussion provides directions on how to find pertinent information about any one of the projects by Tracking Number.

Project Information

For each zone, a table is included that describes certain information about each project by Tracking Number. The table looks like this (Tracking Number 2003-NE-N2 is used for illustrative purposes):

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Description
2003-NE-N2 *Cromwell – Wrenshall – Mahtowa – Floodwood Area*	2011/A	2634	Yes	MP/ GRE	Savanna Project, 115 kV Savanna switching station and Savanna-Cromwell and Savanna-Cedar Valley 115 kV lines, St. Louis Co., MN PUC Docket Nos. CN-10-973 and TL-10-1307

Tracking Number 2003-NE-N2 is the Savanna-Cromwell project in the Northeast Zone. Information about this project can be found in Appendix A of the 2011 MTEP Report and is identified as MTEP Project Number 2634. A certificate of need from the Public Utilities Commission is required and this project is being undertaken by Minnesota Power and Great

River Energy. The Description column of the table provides a short-hand name for the project, a brief description of the project, a timeframe from completing the project, and a PUC Docket Number if one exists.

Tracking Number 2003-NE-N2 corresponds to MTEP Number 2634. Information about the project can be found in Appendix A of the MTEP11 Report by following these steps:

Step 1. Go to the MISO homepage at: https://www.misoenergy.org

Step 2. Click on "Planning" at the top of the page. Then click on the link on the left side of the page entitled "MISO Transmission Planning Expansion (MTEP)."

Step 3. Click on the link for the annual MTEP report that is sought. In the case of the Savannah – Cromwell Project, it is the MTEP 11 Report that is desired. If the report is older than MTEP 11, you will have to select the Study Repository link for an older report.

Step 4. Click on the "MTEP11 Appendices ABC."

Step 5. Select the "Projects" tab at the bottom of the spreadsheet that was just downloaded. Hold down the "Ctrl" key and press the "F" key to bring up the "Find" dialog box. Enter the MTEP Project Number, which in this case is 2634, in the dialog box and select "Find Next." Information about the project can then be read from the row the MTEP Project was found during this search.

Similar steps can be followed for all other projects identified in chapter 6, including those few that are not Appendix A projects (recommended by MISO for approval).

Project Facilities

Appendices A, B and C also contain information on the specific facilities (such as transmission lines, substations, etc.) that are part of a particular project. The steps below show how to find this information for the example project.

Step 1: To find information on specific facilities (transmission lines, substations etc.) that are part of a project click on the "Facilities" tab located at the bottom of the spreadsheet that was downloaded at Step 5 in the above example.

Step 2: Hold down the "Ctrl" key and hit the "F" key to bring up the "Find" dialog box. Enter the MTEP Project Number, which is "2634" in this example, in the dialog box and then click on "Find Next". The "Find Next" link can be clicked until all rows containing information about Project Number 2634 have been found. There will usually be more than one row since most projects involve more than one transmission line or substation or other facility.

This same procedure can be used to find thiskind of information for other projects and their associated facilities for the projects listed in the tables in Chapter 6 using the MTEP Report and the MTEP Project Number.

Detailed Project Information

Starting in 2008, if the project has been either approved or recommended for approval by the MISO board of directors (i.e, designated an Appendix A project), additional, more detailed information about the project can be found in Appendix D1 in the MTEP Report for the year the project was approved by MISO. For large projects, this information includes a project map, project justification and information about the system inadequacy that the project is intended to correct. For smaller projects, a subset of this information is included. Starting with the MTEP08 Report, projects located in Minnesota are contained in the "West Region Project Justifications" portion of Appendix D1 in the MTEP Report year that the project was approved or recommended for approval. For information on Minnesota projects approved by MISO prior to 2008, see the appropriate year Minnesota Biennial Transmission Projects Report for the appropriate year.

Continuing with our example of the Savannah – Cromwell Project, Tracking Number 2003-NE-N2, which is an approved Appendix A project, this additional information can be found by going to Appendix D1 through the following steps.

> Step 1. After following the first three steps described above to get to the appropriate MTEP report, click on the MTEP11 Appendices link.
>
> Step 2. Select MTEP 11 Appendix D1 West.
>
> Step 3. Once the desired Appendix D1 is downloaded, use the pdf search tool to find Project Number 2634 and locate information about this project.

This same procedure can be used to find more detailed information on most projects shown in the tables in Sections 6.3 through 6.8 that have moved to MISO Appendix A since 2008. In addition, if you search for a specific utility's name, you can find information on projects that utility has submitted and have been or are being considered for approval by the MISO board of directors.

Finding Specific Utility Projects in the Appendices

One additional useful tool with the MTEP Reports is the ability to find projects that an individual utility has submitted to MISO. Also, the Appendices can be sorted to show all projects for a particular utility, (or, depending on the version of Excel you are using, a group of utilities.) To do this, from the Appendices ABC page, click on the down arrow located in the column C heading "Geographic Location by TO Member System," and then select the code for the individual utility you are interested in from the drop-down list (NOTE: some versions of Excel will allow you to select multiple utilities).

Utility	MISO Geographic Code
American Transmission Company, LLC	ATC LLC
Dairyland Power Cooperative	DPC
Great River Energy	GRE
ITC Midwest LLC	ITCM
Minnesota Power	MP
Missouri River Energy Services	MRES
Otter Tail Power Company	OTP
Southern Minnesota Municipal Power Agency	SMP
Xcel Energy	XEL

You can also sort other columns in the Appendices in a similar manner. For example, you can sort it to show only projects or facilities in Appendix A by clicking on the arrow in Column A and selecting the desired choice from the drop-down list.

6.3 Northwest Zone

6.3.1 Needed Projects from non-MISO Members

6.3.1.1 Richer – Roseau – Moranville 230 kV Line Uprate

Tracking Number. 2011-NW-N5

Utility. Minnkota Power Cooperative (MPC)

Inadequacy. The Langdon Wind Project is a 200 MW wind farm located approximately 10 miles south of Langdon, ND. The project was built in two stages, Langdon 1 (160 MW) and Langdon 2 (40 MW). The generation is delivered to the Langdon 115 kV Substation via a 10 mile 115 kV line.

As part of the Upper Midwest Wind Initiative, MPC is building an approximately 250 mile 345 kV line from the Center 345 kV substation to the Prairie 345 kV substation. The new line will facilitate the delivery of the output from the Milton R. Young #2 generator over the AC system. The energy produced by Young #2 will also be transferred in increasing shares from Minnesota Power to MPC.

These projects, in conjunction with increasing load in northern Minnesota and a reduction in the schedule of the Square Butte DC line due to Young #2 transitioning to the AC system, are expected to cause additional north to south flows on the 230 kV line connecting the Winnipeg, MB area to the Duluth, MN area. As a result of these increased flows, overloads on the transmission system may occur, namely along the Richer – Roseau – Moranville 230 kV line.

The Richer – Roseau – Moranville 230 kV Line and the substation equipment are owned by Manitoba Hydro, Xcel Energy, and MPC. The current line rating was assigned due to voltage concerns on the line. It was found that at high flow levels, the voltage drop on the line per MW of flow added became increasingly severe.

Alternatives. An investigation has not yet been performed to evaluate mitigation options. The line conductor rating is sufficient to handle the higher flows, so the mitigation will likely be in the form of reactive support. There may also be some work required on the line relays.

Analysis. Firm delivery service for the previously mentioned projects was evaluated in the "Minnkota Power Cooperative Generation Study Report for Service to Native Load", which was performed by MPC. The study showed that a fault on the Forbes – Chisago 500 kV line, along with corresponding cross trip of the Dorsey – Roseau – Forbes 500 kV line and Manitoba DC reductions, caused an overload on the Richer – Roseau – Moranville 230 kV Line, which runs approximately parallel with the 500 kV line. The study demonstrated a final upgrade requirement of 239 MVA.

Schedule. Per "Minnkota Power Cooperative Generation Study Report for Service to Native Load," the line upgrade must be completed by the summer of 2017. A facility study has not yet been performed.

6.3.2 Needed Projects from MISO Members

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2003-NW-N3 *Otter Tail County Area*	2008 / A	1033	No	GRE	Add new Silver Lake 230/41.6 kV Substation along Fergus Falls – Henning 230 kV Line in Otter Tail County to support 41.6 kV system in the area. *This portion of 2003-NW-N3 is complete.*
	2012/A	585	No	OTP	Convert existing 41.6/12.5 kV Substation in Pelican Rapids (Otter Tail County) to 115/12.5 kV Substation to mitigate 41.6 kV system issues *Timeframe: end of 2014*

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2005-CX-1 *Fargo – Monticello 345 kV*	2008 / A	286	Yes	CapX	Add new 345 kV line between Monticello and Fargo to support the Red River Valley and other growing towns along the Interstate 94 corridor during peak load conditions. This project is located in both the Northwest & West Central zones. *Phase 1 – Monticello to St Cloud complete/* *Phase 2 – St Cloud to Alexandria Phase 3 – Alexandria - Fargo construction underway PUC Docket Nos. CN—06-1115 and TL-09-246 and TL-09-1056*.

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2007-NW-N3 *Load Expansions in NW Minnesota*	2010/A 2013/B	2826 4232	No Yes	OTP/ MPC OTP/ MPC	Add capacitor to the 115 kV transmission system in northwest Minnesota at the Karlstad Substation in Kittson County (2 x 10 MVAR), Clearbrook Substation in Clearwater County (2 x 17 MVAR) and the Thief River Falls Substation in Pennington County (1 x 15 MVAR) to support the increasing loads in this area. *This portion of 2007-NW-N3 is completed.* This project is a new 230 kV line of approximately 47 miles between Winger and Thief River Falls. Previous biennial reports have identified a need for support in Northwest MN but a project had not been identified until completion of the OTP High Voltage Study described in Chapter 3. *Timeframe: 2016*
2009-NW-N2 *Frazee-Perham-Rush Lake Area*	2010/A	2670	No	GRE	Voltage problems in the Frazee area are planned to be addressed by the addition of a new Schuster Lake 115/41.6 kV Substation near Frazee in Otter Tail County to support the 41.6 kV system in this area.
2013-NW-N1 *Gentilly Interconnection*	2013/A	4238	No	OTP	MPC has requested interconnection on OTPs 41.6 kV system at Gentilly for additional load support. This project will add a 41.6/12.5 kV delivery at Gentilly. *Timeframe: construction underway*

6.3.3 Completed Projects

Some inadequacies in the Northwest Zone that were identified in the 2011 Biennial Report were alleviated through the construction and completion of specific projects over the last two years or can be moved to the completed category because changed circumstances have eliminated the need for the project. Information about each of the completed projects is summarized briefly in the table below. More information about these projects and inadequacies can be found in the 2011 Report. Also, additional information is available by contacting the designated person for the utility that was responsible for constructing the project.

MPUC Tracking Number	MTEP Year/ App	MTEP Project Number	CON	Utility	Description	Date Completed PUC Docket
2003-NW-N2 *Northern Valley Area*	2010 / B	2824	No	OTP/ MPC	Add capacitor banks (2 x 15 MVAR) on the 115 kV system at the Hensel Substation in Pembina County, North Dakota, to support voltages in the Northern Valley Area. (Also reference 2007-NW-N3).	Cancelled due to new load estimates and a refreshed transmission planning study that recommends adding a second Hensel to Drayton 115 kV line.
2005-NW-N2 *Bemidji – Grand Rapids 230 kV Line*	2006 / A	279	Yes	CapX/ MPC	Added new 230 kV line between Boswell and Wilton (Bemidji – Grand Rapids 230 kV line) to support the Bemidji area and the Red River Valley during winter peak conditions. This project is located in both the Northwest and Northeast zones.	November 2012 *PUC Docket No. TL-07-1327.*

MPUC Tracking Number	MTEP Year/ App	MTEP Project Number	CON	Utility	Description	Date Completed PUC Docket
2009-NW-N3 *Brandon – Miltona – Parkers Prairie Area*	2011/A	2643	No		The existing GRE 41.6/12.5 kV Substation at Parkers Prairie in Otter Tail County was converted to 115/12.5 kV by tapping an existing 115 kV line between Miltona and Elmo to alleviate voltage and loading concerns in this area for an outage of the 115/41.6 kV source at Miltona.	June 2013 *PUC Docket No. TL-11-867*
2009-NW-N6 *Sheyenne – Audubon 230 kV Line*	2013/A	3204	Yes	OTP	Sheyenne – Audubon 230 kV transmission line needed due to the interconnection of wind generation at the Maple River Substation	This project has been cancelled because the CapX2020 Fargo project will mitigate the inadequacy.
2009-NW-N7 *Cass Lake – Nary-Bemidji 115 kV Line*	2010 / A	3156	Yes	CapX	As part of the Bemidji – Grand Rapids 230 kV project (see 2005-NW-N2 and 2005-CX-1), additional 230/115 kV delivery was needed at the Cass Lake Substation (Cass County). Along with this new transformer at Cass Lake, the Cass Lake – Nary 115 kV Line needed to be reconductored to accommodate post-contingent flows. Furthermore, a new 115 kV switching station was added at Nary (Hubbard County).	August 2012 (Cass Lake Substation) December 2012 (Cass Lake reconductor and Nary Switching Station)

MPUC Tracking Number	MTEP Year/ App	MTEP Project Number	CON	Utility	Description	Date Completed PUC Docket
2011-NW-N1 *Doran Tap*	2011 / A	3466	No	OTP	Add a new three-way switch on the Doran – Doran Tap 41.6 kV line to facilitate the interconnection of a new 5 MW wind farm near Doran (Wilkin County, MN).	Cancelled. Generator is no longer in the MISO queue.
2011-NW-N2 *Wind Farm*	2012 / A	3464	No	OTP	Add a new three-way switch on Donaldson – Donaldson Town 41.6 kV line to facilitate the interconnection of a new 20 MW wind farm near Donaldson (Kittson/Marshall Counties, MN).	Cancelled. Generator is no longer in the MISO queue.
2011-NW-N3 *Wind Farm*	2012 / A	3465	No	OTP	The existing Donaldson 115/41.6 kV Substation was to have the 115 kV portion of the substation updated in order to accommodate the interconnection of a new 80 MW wind farm near Donaldson (Kittson/Marshall Counties, MN).	Cancelled. Generator is no longer in the MISO queue.
2011-NW-N4 *Wind Farm*	2011 / A	3462	No	OTP	A new three-breaker 115 kV ring bus was to be established between the existing Karlstad Substation and Viking Substation in order to allow for the interconnection of a 100 MW wind farm near Viking, MN (Marshall County).	Cancelled. Generator is no longer in the MISO queue.

6.4 Northeast Zone

6.4.1 Needed Projects

The following table provides a list of transmission needs identified in the Northeast Zone by MISO utilities. There were no projects identified in this zone by non-MISO utilities.

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2003-NE-N2 *Cromwell – Wrenshall-Mahtowa-Floodwood Area*	2011/A	2634	Yes	MP/ GRE	Savanna Project: 115 kV Savanna switching station and Savanna-Cromwell and Savanna-Cedar Valley 115 kV lines, St. Louis Co., *PUC Docket Nos. CN-10-973 and TL-10-1307* *Timeframe: 2015*
2003-NE-N6 *Taconite Harbor – Grand Marais Area*	NA	NA	Yes	GRE	Taconite Harbor-Grand Marais 69 kV rebuild to 115 kV. This project has been delayed indefinitely due to drop in load growth.
2007-NE-N1 *Duluth Area 230 kV*	2009/C	2548	Yes	MP	Duluth 230 kV Project: New 230/115 kV transformer & transmission line upgrade to 230 kV to increase load-serving capability in the Duluth area. Recent study indicates this project is not needed until the 2020 timeframe.
2007-NE-N2 *Essar Steel Project*	2010/A	2547	No	MP	Essar 230 kV Project: Transmission for Essar Steel, Grand Rapids-Nashwauk areas, Itasca Co. Phase 1 is completed. *PUC Docket No. TL-09-512*.
2007-NE-N6 *Onigum Area*	2012/B	2632	No	GRE	Onigum 115 kV conversion. Line is currently less than 10 miles, however CON may be required if route is altered. Cass and Hubbard counties.

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2009-NE-N1 *Nugget – Hoyt Lakes*	2009/A	2552	No	MP	Skibo-Hoyt Lakes 138 kV Line: New ~3 mile transmission line needed to provide redundant sources for expansion of an existing industrial customer; Hoyt Lakes Area, St. Louis Co.
2009-NE-N2 *Deer River Tap*	2012/C	2551	No	MP	28 Line Tap Reconfiguration: Put existing tap on dedicated breaker and rebuild to higher capacity, Cohasset – Deer River, Itasca Co. (This project has been cancelled in favor of MTEP Project #3531.)
2009-NE-N2 *Deer River Area (f/k/a Deer River Tap)*	2012/B	3531	No	MP	Deer River 230 kV Project: construct Zemple 230/115 kV Substation to increase load-serving capability and improve reliability in Deer River and the surrounding area; Deer River, Itasca Co. Due to line length, a CON was not required. *PUC Docket No. TL-13-68.* *Timeframe: 2015*
2009-NE-N4 *Brainerd Lakes – Remer-Deer River Area*	NA	NA	Yes	GRE	Macville-Blind Lake 115 kV line and Macville 230/115 kV substation. This project has been delayed indefinitely due to drop in load growth.
2009-NE-N5 *Ortman Project*	2010/A	2621	No	GRE	Build a new 230/69 kV transmission substation and build a new 20-mile 69 kV transmission line from the new Ortman Substation to the existing 69 kV transmission line just west of the Bigfork Substation

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2009-NE-N6 *Staples-Motley-Long Prairie Area*	NA	NA	Maybe	GRE	Shamineau Lake 115 kV substation and 115 kV line. This project has been delayed indefinitely due to drop in load growth.
2009-NE-N7 *Park Rapids Area*	2010/A 2012/B	2566 2566	No No	GRE	Potato Lake 115 kV distribution sub and 115 kV line. Mantrap 115 kV conversion. This project is projected to be in-service in 2017 or sooner depending on load growth. The 2010/A portion of this project is complete. The 2012/B portion is expected to start in 2015. *PUC Docket No. TL-10-86.*
2009-NE-N8 *Barrows Area*	NA	NA	No	GRE	Barrows distribution substation and 115 kV line. This project has been delayed indefinitely due to drop in load growth.
2009-NE-N9 *Shell Lake Area*	2011/A	2599	No	GRE	Shell Lake 115 kV distribution substation and 115 kV line. This line will be built at 69 kV.
2009-NE-N10 *Iron Hub*	NA	NA	No	GRE	Iron Hub distribution substation and 115 kV line. This project has been delayed indefinitely due to drop in load growth.
2009-NE-N11 *Rush City-Cambridge-Princeton-Milaca Area*	NA	NA	Yes	GRE	Rush City-Milaca 230 kV line and Dalbo 230/69 kV source. This project has been delayed indefinitely due to drop in load growth.
2011-NE-N1 *9 Line Upgrade*	2011/A	3373	No	MP	Rebuild existing 115 kV line to higher capacity. Blackberry – Meadowlands, St. Louis & Itasca Co. A CON was not required for this project.

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2011-NE-N2 *15 Line Rebuild*	2011/A	2549	No	MP	15 Line Reconfiguration: Rebuild & reconfigure existing 115 kV line to higher capacity, Fond-du-Lac – Hibbard, Duluth area, St. Louis Co.
2011-NE-N5 *North Met Sub*	2010/A	2761	No	MP	Construct new 138/13.8 kV substation to serve new mine, Hoyt Lakes area, St. Louis Co.
2011-NE-N8 *18 Line Upgrade*	2012/A	1292	No	MP	Increase capacity of existing 115 kV line, Forbes – United Taconite, Eveleth area, St. Louis Co.
2011-NE-N9 *Verndale Transformer*	2012/A	3534	No	MP	Increase 115/34.5 kV transformer capacity at existing Verndale Substation, Verndale, Wadena Co.
2011-NE-N10 *Laskin Transformer*	2009/A	2759	No	MP	Increase 115/46 kV transformer capacity and replace end-of-life equipment at existing Laskin Substation, Hoyt Lakes area, St. Louis Co.
2011-NE-N11 *Savanna 230 kV Expansion*	2012/C	3533	Yes	MP	Expansion of the Savanna Substation to 230/115 kV. Rebuild of existing 115 kV line (MTEP Project #3373) proved more economical for transmission line loading issue. Project may be required for future voltage support depending on area load growth; Floodwood area, St. Louis Co. *Timeframe: Deferred Indefinitely*.

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2011-NE-N12 *Wrenshall Substation*	2012/C	3756	No	MP	Develop new 115/46 kV substation in Thomson – Cromwell 115 kV Line to improve reliability in eastern Carlton Co. The project will eliminate the need for existing distribution circuits that would otherwise need to be rebuilt due to age and condition and is also a lower cost alternative; Wrenshall, Carlton Co.
2011-NE-N13 *MH-MP 230 kV Line*	2012/C	3562	Yes	MP	230 kV transmission connection to Manitoba needed to deliver 250 MW PPA from Manitoba Hydro to Minnesota Power. Alternative to MTEP Project #3831; located in St. Louis, Itasca, Koochiching, Lake of the Woods, & Roseau Co. (see Section 3.3.2) *Timeframe:230 kV Alternative Deferred Indefinitely*
2013-NE-N1 *39 Line Reconfiguration*	2013/A	4039	No	MP	Reconfigure Laskin – Virginia 115 kV Line; easement expiration over mine property requires removal & relocation of the line; Eveleth area, St. Louis Co. *PUC Docket No. TL-12-1123*
2013-NE-N2 *North Shore Switching Station*	2013/A	4042	No	MP	New 115 kV switching station needed to improve industrial customer reliability. Silver Bay, Lake Co.
2013-NE-N3 *Two Harbors Transformer*	2013/A	4043	No	MP	New 115/14 kV transformer at Two Harbors Switching State; age & condition of existing Two Harbors substation. Two Harbors, Lake Co.

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2013-NE-N4 *Mesabi 115 kV Project*	2012/B	3791	No	MP	115 kV switching station, capacitor banks, transmission line upgrades to improve reliability & facilitate industrial load growth in the Keewatin area, Itasca & St. Louis Cos.
2013-NE-N5 *Canisteo Project*	2013/A	4040	No	MP	New substation in Boswell – Nashwauk 115 kV line to serve new industrial customer near Taconite, Itasca Co.
2013-NE-N6 *Panasa Project*	2013/A	4041	No	MP	Panasa Project: Tap of Nashwauk – Blackberry 115 kV line to serve new industrial customer near Calumet, Itasca Co.
2013-NE-N7 *Canosia Road Substation*	2013/B	4044	No	MP	New 115/14 kV substation in Arrowhead – Cloquet 115 kV line to unload feeders at existing Cloquet Substation and retire aging Midway Substation. Esko, Carlton Co.
2013-NE-N8 *Embarrass Transformer:*	2013/B	4045	No	MP	New 115/23 kV transformer at Embarrass Switching Station; unload Laskin – Virginia 46 kV system; Hoyt Lakes area, St. Louis Co.
2013-NE-N9 *15th Avenue West Transformer*	2013/C	4047	No	MP	New 115/34.5 kV transformer at 15th Avenue West; reliability, load growth, & unloading existing substations. Duluth, St. Louis Co.
2013-NE-N10 *Graham Mine Substation*	2013/C	4046	No	MP	New substation in Laskin – Hoyt Lakes 138 kV line to facilitate industrial customer expansion, Hoyt Lakes Area, St. Louis Co.
2013-NE-11 *Arrowhead 230 kV Cap Bank*	2012/A	3843	No	MP	New 40 MVAR capacitor bank needed for voltage support at HVDC terminal; Hermantown, St. Louis Co. *Timeframe: Completed*

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2013-NE-N12 *Bison 230 kV Cap Bank*	2012/A	3842	No	MP	New 40 MVAR capacitor bank needed for voltage support at Bison Wind Energy Center; New Salem, North Dakota. This is a project in North Dakota and is reported here for informational purposes only. *Timeframe: Completed*
2013-NE-N13 *Great Northern Transmission Line*	2013/B 2012/C	3831 3832	Yes	MP/MH	New 500 kV & 345 kV lines from Winnipeg-Iron Range-Duluth to facilitate increased transfer capability from Manitoba – United States, increase regional access to clean, renewable Canadian hydropower, and improve system reliability (MTEP Project #3831 is the 500 kV build and Project #3832 is the 345 kV build). Impacted counties could include Kittson, Roseau, Marshall, Pennington, Red Lake, Polk, Clearwater, Lake of the Woods, Beltrami, Koochiching, Itasca, and St. Louis. (see Section 3.3.2) *PUC Docket No. CN-12-1163* *Timeframe: October 2013*
2013-NE-N14 *NERC Facility Ratings Alert Medium Priority*	2013/A	4293	No	MP	Derates and physical mitigation on NERC "medium" priority lines. MP system-wide
2013-NE-N15 *NERC Facility Ratings Alert Low Priority*	2013/A	4294	No	MP	Derates and physical mitigation on NERC "low" priority lines. MP system-wide
2013-NE-N16 *HVDC Valve Hall Replacement*	2013/B	4295	No	MP	Modernization of Arrowhead & Square Butte converter stations. Hermantown area, St. Louis Co, MN & Center, ND

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2013-NE-N17 *HVDC 750 MW Upgrade*	2013/C	3856	No	MP	Upgrade capacity of existing HVDC line & terminals to 750 MW. Hermantown area, St. Louis Co.
2013-NE-N18 *44 Line Upgrade*	2014/A	4425	No	MP	Increase capacity of existing 115 kV line, Forbes – Hibbing, St. Louis Co.
2013-NE-N19 *Hoyt Lakes Sub Modernization*	2014/A	4426	No	MP	Rebuild and reconfigure aged Hoyt Lakes Substation to serve new industrial customer. Hoyt Lakes area, St. Louis Co.
2013-NE-N20 *Haines Road Capacitor Bank*	2014/C	4427	No	MP	New 115 kV capacitor bank at Haines Road Substation needed for voltage support in the Duluth area, St. Louis Co.
2013-NE-N21 *Verndale – Hubbard 115 kV Line*	2014/B	2571	Yes	GRE/ MP	New Hubbard-Cat River 115 kV line that will replace 2007-NE-N3. Due to motor starting at pumping station, it was decided to immediately operate at 115 kV. To do so, Hubbard 115 kV bus would need the removal of a 115/34.5 kV transformer. This transformer would be moved to the new proposed Cat River Substation. The 115 kV line is expected to be over 20 miles in length and will serve 34.5 kV load between Verndale and Hubbard.

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2013-NE-N22 *Osage Area 115 kV Line*	2014/B	4378	Yes	GRE	Due to system intact and contingency voltage concerns in the Osage area and the radial aspect of two GRE radial lines, it was decided to build a Hubbard-Elijah-Potato Lake 115 kV system to provide higher reliability to the loads of concern. To do so, Hubbard 115 kV bus would need the removal of a 115/34.5 kV transformer. This transformer would be moved to the new proposed Elijah Substation. The 115 kV line is expected to be over 17 miles in length and will serve 34.5 kV load between Hubbard and Long Lake largely in the Osage area. The Potato Lake-Mantrap radial is expected to be built to 115 kV prior to this project being in service (2009-NE-N7).
2013-NE-N23 *39 Line & 16 Line Reconfiguration*	2013/B	4428	No	MP	Reconfigure Laskin – Virginia 115 kV Line and Virginia – ETCO – Arrowhead 115 kV Line; easement expiration over mine property requires removal & relocation of the line; Possible alternative to 39 Line Reconfiguration (2013-NE-N13) due to construction issues. Eveleth area, St. Louis Co. *PUC Docket No. TL-12-1123*

6.4.2 Completed Projects

Some inadequacies in the Northeast Zone that were identified in the 2011 Biennial Report were alleviated through the construction and completion of specific projects over the last two years or can be moved to the completed category because changed circumstances have eliminated the need for the project. Information about each of the completed projects is summarized briefly in the table below. More information about these projects and inadequacies can be found in the 2011 Biennial Report. Also, additional information is available by contacting the designated person for the utility that was responsible for constructing the project.

MPUC Tracking Number	MTEP Year/ App	MTEP Project Number	CON	Utility	Description	Date Completed PUC Docket
2003-NE-N4 *Central Lakes Area*	2005/A	600	No	GRE/ MP	Southdale-Scearcyville 115 kV line (aka Baxter-Southdale) and Scearcyville Substation	July 2012
2003-NE-N5 *Pierz-Genola* Area	2010/A	1018	No	GRE/ MP	MP Little Falls to GRE Little Falls 115 kV line *PUC Docket No. TL-11-318*	April 2013
2003-NE-N9 *Nashwauk Area*	2011/B 2012/A	2569	No	GRE	Shoal Lake 115 kV distribution	October 2013

MPUC Tracking Number	MTEP Year/ App	MTEP Project Number	CON	Utility	Description	Date Completed PUC Docket
2005-CX-1 *Bemidji – Grand Rapids 230 kV Line*	2006/A	279	Yes	CapX	Added new 230 kV line between Boswell and Wilton (Bemidji – Grand Rapids 230 kV line) to support the Bemidji area and the Red River Valley during winter peak conditions. This project is located in both the Northwest and Northeast zones. *PUC Docket No. TL-07-1327.*	November 2012
2005-NE-N2 *Mesaba IGCC Generator*	2007/A	1025	No	Excelsior Energy[1]	Mesaba IGCC Generator outlet lines, Grand Rapids area, Itasca Co.	2005-NE-N2
2007-NE-N3 *Hubbard – Menahga Area*	2011/A	2571	NA	GRE	MN Pipeline-Menahga 115 kV line (operated at 34.5 kV). This project is impacted by pipeline pumping station voltage drop issues. Consideration was giving to extending the line to Hubbard or to the RDO-Osage 34.5 kV line.	Cancelled, replaced with the Hubbard – Cat River project 2013-NE-N21
2007-NE-N5 *Pokegama Area*	2010/A	2576	No	GRE	Pokegama 115 kV distribution substation	Dec. 2011
2009-NE-N3 *Line 28 Reroute*	2010/A	3091	No	MP	Relocate line, Nashwauk area, Itasca Co.	May 2013
2011-NE-N3 *Swan Lake Sub*	2010/A	2762	No	MP	New Swan Lake load serving Substation, Duluth, St. Louis Co.	April 2013

[1] Excelsior Energy is an independent energy development company that has proposed to construct and operate the Mesaba Energy Project and is not a MTO member. See Section 6.3.8 of the 2009 Biennial Report for more information.

MPUC Tracking Number	MTEP Year/ App	MTEP Project Number	CON	Utility	Description	Date Completed PUC Docket
2011 NE-N4 *LSPI 34.5 kV*	2009/A	2763	No	MP	Added LSPI 34.5 kV Transformer, Duluth, St. Louis Co.	March 2012
2011-NE-N6	2011/A	3374	No	MP	Re-energized existing Substation, Taconite MN area, Itasca Co.	April 2012
2011-NE-N7 *25 Line Tap*	2012/A	3532	No	MP	25L tap, constructed 115/34.5 kV substation, Hibbing MN area, St. Louis Co.	July 2012
2013-NE-N11 *Arrowhead 230 kV Cap Bank*	2012/A	3843	No	MP	New 40 MVAR capacitor bank needed for voltage support at HVDC terminal; Hermantown, St. Louis Co.	December 2012
2013-NE-N12 *Bison 230 kV Cap Bank*	2012/A	3842	No	MP	New 40 MVAR capacitor bank needed for voltage support at Bison Wind Energy Center; New Salem, North Dakota	August 2012

6.5 West Central Zone

6.5.1 Needed Projects

The following table provides a list of transmission needs identified in the West Central Zone by MISO utilities. There were no projects identified in this zone by non-MISO utilities.

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2003-WC-N7 *Panther Area*	NA	NA	Yes	GRE	Brownton-McLeod 115 kV line. This project has been delayed indefinitely due to drop in load growth.
2003-WC-N8 *Douglas County – Paynesville-Waklefield-West St. Cloud*	NA	NA	Yes	GRE	Alexandria-West St. Cloud 115 kV line. This project has been delayed indefinitely due to drop in load growth. CapX Fargo-Monticello may alter this project significantly.
2005-CX-1 *Monticello – St. Cloud – Fargo 345 kV Line*	2008 / A	286	Yes	CapX	Add new 345 kV Line between Monticello and Fargo to support the Red River Valley and other growing towns along the Interstate 94 corridor during peak load conditions. This project is located in both the Northwest and West Central zones. *Phase 1 – Monticello to St Cloud complete/* *Phase 2 – St Cloud to Alexandria Phase 3 – Alexandria - Fargo construction underway* *PUC Docket No. CN-06-1115 and TL-09-1056 and TL-08-1474.*

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2005-CX-2 *Brookings, S.D. to Hampton 345 kV Line*	2011 / A	1203	Yes	CapX	Add new 345 kV line between Brookings, South Dakota, and Southeast corner of Twin Cities. This line is located in the Southwest, West Central, and Twin Cities Zones. *PUC Docket No. CN-06-1115 and TL-08-1474.* *Timeframe: construction underway*
2009-WC-N4 *Sartell Distribution Substation*	2010/A	2564	No	GRE	Sartell 115 kV distribution substation and 115 kV line *Timeframe: 2014*
2009-WC-N5 *Paynesville – Wakefield – Maple Lake Area*	NA	NA	No	GRE	Watkins 115/69 kV source This project has been delayed indefinitely due to drop in load growth. *Timeframe: 2014*
2009-WC-N6 *Elk River – Becker Area*	2012/C	2691	No	GRE	Orrock 345/115 substation and Hwy 10 115 kV lines to Enterprise Park and Liberty. Orrock land is currently being sought. Project will move forward as load grows on HWY 10 corridor between Anoka and Becker. Projects are expected to move within next 5 to 10 years. *Timeframe: 2014*
2009-WC-N7 *Brooten - Lowery*	NA	NA	No	XEL	This project is to reconductor an existing 69 kV line to address low voltage along Westport to Lowrey. *Timeframe: 2014*

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2011-WC-N1 *Highway 212 Corridor Project*	2011/A	3310	Yes	XEL	This project is to complete the conversion of 69 kV line between Scott County and West Waconia substation to 115 kV. The scope also involves building new West Creek distribution substation and converting the Victoria and Augusta substations to 115 kV and retiring Chaska downtown substation. *Timeframe: 2014*
2011-WC-N2 *MN Valley – Maynard – Kerkhoven tap rebuild*	2011/A	3312	No	XEL	This project is to upgrade the Minn Valley – Maynard – Kerkhoven tap 115 kV line to 795 ACSS conductor *Timeframe: 2014*
2011-WC-N3 *Brownton -Winthrop*	2012/A		No	XEL	New 1 mile 69 kV line from Brownton to GRE (Winthrop – Hassen) 69 kV line
2011-WC-N4 *Corridor Upgrade Panther Area*	C	2177	Yes	XEL	Convert Minn Valley – Panther – McLeod – Blue Lake 230 kV line to Double circuit 345 kV from Hazel to McLeod to West Waconia to Blue Lake. *Timeframe: Well beyond 2018. See Section 8.7*
2011-WC-N5 *Rebuild 69 kV Maple Lake - Watkins*	2009 / A	2309	No	XEL	This project is to rebuild 20 miles of 69 kV line from Maple Lake to Watkins in West Central Minnesota *Timeframe: 2014*

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2013-WC-N1 *Upgrade St. Stephen Substation*	2014 / C (seeking A)	4014	No	GRE-XEL	Convert 69 kV St. Stephen substation to 115 kV service. Will include converting approximately 1 mile of existing 69 kV transmission line to 115 kV. This will remove load from West St. Cloud transformer which is overloaded during peak times or during n-1 outages.
2013-WC-N2 *Rebuild 115 kV Line Quarry – St. Cloud*	2014 / C (seeking A)	4379	No	GRE-XEL	Build approximately 2 ½ miles of 115 kV line between Quarry 345/115 kV Substation to West St. Cloud 115/69 substation. This is for a C3 event that would result in significant load shed in area NW of St. Cloud. Potential cascade tripping in a confined area may occur.
2013-WC-N3 *Priam Substation*	2014 / C (seeking A)	4380	No	WMU/ GRE	Build a 115/69 kV substation to be named Priam three miles west of Willmar. Move Willmar 115/69 kV transformer to this new substation. The purpose of this substation is to remove Willmar load from a single delivery location.
2013-WC-N4 *Replace 41.6 kV line Herman - Nashua*	2012 / A	3665	No	OTP	Poor condition of facilities between Herman and Nashua on the OTP 41.6 kV system is leading to the replacement of 16 miles of existing 41.6 kV line.

6.5.2 Completed Projects

Some inadequacies in the West Central Zone that were identified in the 2011 Biennial Report were alleviated through the construction and completion of specific projects over the last two years or can be moved to the completed category because changed circumstances have eliminated the need for the project. Information about each of the completed projects is summarized briefly in the table below. More information about these projects and inadequacies can be found in the 2011 Biennial Report. Also, additional information is available by contacting the designated person for the utility that was responsible for constructing the project.

MPUC Tracking Number	MTEP Year/ App	MTEP Project Number	CON	Utility	Description	Date Completed PUC Docket
2003-WC-N5 *Willmar – Litchfield – Paynesville Area*	NA	NA	No	GRE	Spicer 230/69 kV source	Cancelled and replaced with a 69 kV project that met multiple needs.
2007-WC-N2 *Morris 230/115 kV Transformer*	NA	NA	No	Western Area Power Admin.	Morris transformer	Cancelled due to cancellation of Big Stone II generation project.
2007-WC-N3 *Morris – Grant County 115 kV Line*	NA	NA	No	OTP/MRES	Morris-Grant County 115 kV line	Cancelled due to cancellation of Big Stone II generation project.
2007-WC-N4 *West Central Minn. Gen Outlet*	NA	NA	No	Various Minn. Utilities	West Central Minnesota Generation Outlet	Cancelled due to cancellation of Big Stone II generation project.
2009-WC-N1 ***Osakis – Sauk Center***	2009 / A	2158	No	XEL	Upgrade Sauk Center – Osakis 69 kV line to a lower impedance.	2013
2009-WC-N3 *Maynard – Kerkhoven tap*	NA	NA	No	XEL	Rebuild Maynard-Kerkhoven 115 kV line *Timeframe: 2014*	Duplicate. See 2011-WC-N2

MPUC Tracking Number	MTEP Year/ App	MTEP Project Number	CON	Utility	Description	Date Completed PUC Docket
2011-WC-N6 *Rebuild 69 kV Grove Lake - Glenwood*	2009 / A	2308	No	XEL	This project is to rebuild 13 miles of 69 kV line from Grove Lake switching station to Glenwood to 477 ACSR	2013
2011-WC-N7 *St. Cloud – Mayhew Lake 115 kV Line*	2009 / A	2307	No	XEL	(1) New 4 mile 115 kV line from St. Cloud tap to Mayhew Lake substation. (2) Convert Benton Co – St. Cloud double circuit to bifurcated line and reterminate into Mayhew Lake substation (3) Convert St. Cloud tap to Granite City into bifurcated line (this results in single 115 kV circuit from St. Cloud to Granite City).	Cancelled due to permanent loss of customer load.

6.6 Twin Cities Zone

6.6.1 Needed Projects

The following table provides a list of transmission needs identified in the Twin Cities Zone by MISO utilities. There were no projects identified in this zone by non-MISO utilities.

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2003-TC-N1 *Aldrich to St. Louis Park*	NA	NA	No	XEL	Upgrade not necessary at this time.
2003-TC-N10 *Twin Cities 345/115 kV Transformer Capacity*	NA	NA	NA	XEL	Twin Cities 345/115 kV transformer capacity approaching emergency loading levels. No specific project identified.
2003-TC-N12 *Enterprise Park*	2005/A	599	No	GRE	Crooked Lake-Enterprise Park 115 kV line. *PUC Docket No. TL-11-915*
2005-TC-N7 *Twin Cities Fault Current Issue*	NA	NA	No	XEL	No specific needs have been identified at this time.
2005-CX-2 *Brookings – Hampton 345 kV Line*	2011 / A	1203	Yes	CapX	Add new 345 kV line between Brookings, South Dakota, and Southeast corner of Twin Cities. This line is located in the Southwest, West Central, and Twin Cities Zones. *PUC Docket No. CN-06-1115 and TL-08-1474.* *Timeframe: construction underway*

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2005-CX-3 *Hampton – La Crosse 345 kV Line*	2008 / A	1024	Yes	CapX	Add new 345 kV line between Southeast corner of Twin Cities, Rochester, and La Crosse, Wisconsin. This line is located in the Twin Cities and Southeast Zones. *PUC Docket No. CN-06-1115 and TL-09-1448.* *Timeframe: construction underway*
2007-TC-N1 *Southwest Metro 115 kV Development*	2012/A	3572-GRE	Yes	XEL/ GRE	Augusta and Victoria conversion. This project is coordinated with the Xcel Scott County-West Waconia project. The permitting process is underway with the final hearing having been held September 2013. *PUC Docket Nos. CN-09-1390 and TL-10-249.* *Timeframe: Construction underway*
2007-TC-N4 *Arsenal Development*	NA	NA	TBD	XEL	Load serving infrastructure investments needed to meet growth in area demand.
2009-TC-N1 *Dakota Electric Dist. Substations*	2010/A	2570	No	GRE	Ravenna 161 kV distribution substation. This project is expected to be in service in early 2015.
2009-TC-N2 *Elko - New Market & Cleary Lake Areas*	NA	NA	Yes	GRE	Glendale-Lake Marion-Helena 115 kV plan. *PUC Docket No. CN-12-1235 and TL-12-1245*

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2009-TC-N5 *Scott County – Carver County – New Prague*	NA	NA	Maybe	GRE	Carver County-Assumption-Belle Plaine 115 kV line. This project has been delayed indefinitely due to drop in load growth. Xcel Energy's Sheas Lake project may delay the need of this project, although portions of the line may need to be rebuilt due to age.
2011-TC-N1 *Kohlman Lake – Long Lake double circuit*	2011/A	3314	No	XEL	This project is to convert the Kohlman Lake - Long Lake 115 kV bifurcated line to double circuit with separate line terminations at Kohlman Lake and Long Lake
2011-TC-N2 *Chisago County Transformer*	2011/A	3315	No	XEL	This project is to install a 2nd 345/115 kV transformer at Chisago County
2011-TC-N3 *Upgrade Riverside – Apache Line*	2011/A	3316	No	XEL	This project is to upgrade Riverside - Apache line to 360 MVA and upgrade Apache switch to 2000A
2011-TC-N4 *Double circuit Goose Lake – Kohlman Lake*	2011/A	3317	No	XEL	This project is to convert the single circuit line between Goose Lake and Kohlman Lake to double circuit. *PUC Docket No. TL-12-1151*
2011-TC-N5 *Parkers Lake*	2011/A	3318	No	XEL	This project replaces some of the 115 kV breakers at Parkers Lake with 63 kA rated breakers.
2011-TC-N8 *Rebuild Black Dog - Savage*	2011/A	3326	No	XEL	This line will rebuild the 115 kV line from Black Dog to Savage to 795 ACSS conductor.

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2011-TC-N9 *Medina – Plymouth Upgrade*	2011/A	3454	Yes, could be more than 10 miles long	XEL/ GRE	This project will upgrade the 69 kV line from GRE's Medina to Plymouth substations. A new switching station will be added on GRE's 115 kV line between Parkers Lake and Elm Creek north or south of the Plymouth Substation depending on the permitted location. Joint project with GRE P3394 at Medina. *PUC Docket Nos. CN-12-113 and TL-11-152*
2011-TC-N10 *Kohlman Lake Sub*	2012/A		No	XEL	Install 30 MVAR reactor at Kohlman Lake substation
2011-TC-N11 *Chisago County Sub*	2012/A		No	XEL	Install 40 MVAR reactor at Chisago County substation
2011-TC-N12 *Red Rock Sub*	2012/A		No	XEL	Install 30 MVAR reactor at Red Rock substation
2011-TC-N13 *Upgrade Lake Marion - Burnsville*	2010/B	3121	No	XEL	Upgrade 13 miles of 115 kV line between Lake Marion and Burnsville to higher capacity
2011-TC-N14 *New Lake - Chicago Sub*	2009/A	2772	Yes	XEL	New 115 kV distribution substation with four terminations tapping the Elliot Park - Southtown line, 1.5 miles of 115 kV underground conductor connecting to a new distribution substation near Lake and Chicago. *Part of Hiawatha Project PUC Docket Nos. CN-10-694 and TL-09-38.*

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2011-TC-N15	2008/A	675	No, project scope has changed	XEL	Upgrade 14.3 miles from Westgate-Deephaven-Excelsior-Scott County from 69kV to 115 kV, Uprate 2 miles from Westgate-Eden Prairie 115kV #1 and #2 to 400 MVA. Substation work at Westgate, Deephaven, Excelsior and Scott County. *Timeframe: 2014-2015*
2013-TC-N1 *Scott County Sub*	2013	4306	No	XEL	Install 2x 345-115 kV transformers at Scott County substation and build "in-out" tap into the substation from Helena - Blue Lake 345 kV line
2013-TC-N2 *Wilson Sub*	NA	NA	No	XEL	Convert the Wilson Substation into a Breaker and ½ design for increased reliability
2013-TC-N3 *Elm Creek Sub*	NA	NA	No	XEL	Interconnect a second distribution transformer at Elm Creek
2013-TC-N4 *Lawrence Creek Sub*	NA	NA	No	XEL	Install a 25 MVAR reactor at the Lawrence Creek substation

6.6.2 Completed Projects

Some inadequacies in the Twin Cities Zone that were identified in the 2011 Biennial Report were alleviated through the construction and completion of specific projects over the last two years or can be moved to the completed category because changed circumstances have eliminated the need for the project. Information about each of the completed projects is summarized briefly in the table below. More information about these projects and inadequacies can be found in the 2011 Biennial Report. Also, additional information is available by contacting the designated person for the utility that was responsible for constructing the project.

MPUC Tracking Number	MTEP Year/ App	MTEP Project Number	CON	Utility	Description	Date Completed PUC Docket
2009-TC-N3 *Parkwood – Coon Creek Area*	NA	NA	No	GRE	Parkwood-Coon Creek second 115 kV circuit.	Cancelled. Withdrawn in favor of the Orrock development to Enterprise Park to address NERC Cat C3 concerns and to provide load growth opportunities between Elk River and Anoka.
2009-TC-N6 Plymouth – Medina 115 kV rebuild	NA	NA	No	XEL/ GRE	Rebuild 69 kV to 115 kV in cities of Plymouth and Medina.	This project is covered under Tracking Number 2011-TC-N9. *PUC Docket No. TL-11-52.*
2011-TC-N6 *Chemolite Project*	2011/A	3321	No	XEL	This project adds two breakers at Chemolite to insure only one line at a time is removed from service during a breaker failure.	June 2011
2011-TC-N7 *Orono Project*	2011/A	3325	No	XEL	This project moved the supply for Orono from its current 69 kV supply to the 115 kV line from Medina to Crow River.	November 2013

MPUC Tracking Number	MTEP Year/ App	MTEP Project Number	CON	Utility	Description	Date Completed PUC Docket
2011-TC-N16 *Plato Project*	2009/A	1952	No	XEL	This project is to add a 10 MVAR cap bank at Plato. This project is required to convert the existing 69 kV line from Young America - Glencoe to 115 kV (part of Glencoe - West Waconia 115 kV line project).	2013

6.7 Southwest Zone

6.7.1 Needed Projects

The following table provides a list of transmission needs identified in the Southwest Zone by MISO utilities. There were no projects identified in this zone by non-MISO utilities.

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2005-CX-2 *Brookings – Hampton 345 kV Line*	2011 / A	1203	Yes	CapX	Add new 345 kV line between Brookings, South Dakota, and Southeast corner of Twin Cities. This line is located in the Southwest, West Central, and Twin Cities Zones. *PUC Docket No. CN-06-1115 and TL-08-1474.* *Timeframe: construction underway*

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2005-SW-N1 *Worthington Area*	2012/A	3574	No	GRE/ ITCM	Worthington-Elk 69 kV rebuild to 115 kV. *In service expected November 2014.* Upgrade Worthington Area Transformer by replacing existing 161/69 kV transformers at Elk. *This portion of 2005-SW-N1 was completed October 2011.*
2007-SW-N1 *Storden Wind Generation Interconnect*	B	1741	No	ITCM	MISO project G517 Storden Wind Interconnection – Specific upgrades required for project to be determined by MISO Restudy and pending FERC orders.
2009-SW-N1 *Fenton 69 kV Interconnect*	2009	NA	TBD	XEL	Fenton 69 kV Interconnection to serve several towns between Pipestone and Marshall.

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2011-SW-N1 *Brookings – Hampton 345 kV Line*	2011/A	1203	Yes	XEL/ GRE	Construct Brookings Cty-Lyon Cty (Single Ckt 345 kV); Lyon Cty-Cedar Mountain-Helena (Double Ckt 345 kV); Helena-Lake Marion-Hampton Corner (Single Ckt 345 kV); Lyon Cty-Hazel (Single Ckt 345 kV); Hazel-Minnesota Valley (Single Ckt 345 kV, initially operate at 230 kV); Cedar Mountain-Franklin (Single Ckt 115 kV). Install 345/115 kV transformers at Lyon County, Cedar Mountain, and Chub Lake. Install two 115/69 kV transformers at Franklin substation. Conductor upgrade on Chub Lake (Lake Marion)-Kenrick-Ritter Park-Dakota Heights-Burnsville 115 kV line. Conductor upgrade on Arlington-Green Isle 69 kV line. Equipment upgrades on Lake Marion-Lake Marion Tap 69 kV line. Chub Lake 115/69 kV Transformer upgrade. *Part of 2005-CX-2*
2011-SW-N2 *Pipestone Upgrade*	2011/A	3309	No	XEL	Upgrade the wave traps and line switches at Buffalo Ridge to 2000 A going to Lake Yankton and Pipestone. Retap the Pipestone CTs to 2000 A going to Buffalo Ridge.
2011-SW-N3 *Split Rock Breakers*	2011/A	3319	No	XEL	This project replaces some of the 115 kV breakers at Split Rock with 63 kA rated breakers.
2011-SW-N4 *Split Rock Reactor*	2011/A	3320	No	XEL	This project is needed to replace the failed 50 MVAR Split Rock reactor and associated breaker.

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2011-SW-N5 *Fenton Substation*	2010/A	2767	No	XEL	This project is to install a new 115/69 kV transformer at Fenton substation. Break the existing 69 kV line between Chandler Tap and Lake Wilson to create an in and out to the Fenton substation.
2011-SW-N6 *G520 Network Upgrades*	B See: https://www.misoenergy.org/Library/Repository/Study/Generator%20Interconnection/GI-G491_G520-SIS_Restudy_Report.pdf	2107	No	XEL	Install new 3-position 115 kV substations (tapping Lake Yankton - Lyon County 115 kV line) with breakers, switches, buswork, steel, foundations, control house and associated equipment. Install new loop in-and-out tap, 3.5 miles of double circuit, 115 kV transmission line.
2011-SW-N8 *G349 Upgrades*	2006/A	1458	No	XEL	Located in Southwestern Minnesota around the Buffalo Ridge area. Upgrades to Yankee substation, Brookings Co 345/115 substation, Hazel Creek 53 MVAR capacitor, Brookings-Yankee 115 kV line.
2011-SW-N11 *Franklin Upgrade*	2010/B	3099	No	XEL	115/69 kV transformers 1 and 2 to 112 MVA as part of the CapX underlying system upgrade.
2013-SW-N1 *Heron Lake Capacitors*	2012/A	3528	No	ITCM	Heron Lake – Install 150 MVA capacitor bank
2013-SW-N2 *Heron Lake – Lakefield 161 kV Rebuild*	2008/A	1618	No	ITCM	Rebuild Heron Lake to Lakefield 161 kV line to 446 MVA

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2013-SW-N3 *Freeborn – Glenworth 161 kV Line*	Future - 2014/A	TBD	Yes	ITCM	New Freeborn to Glenworth 161 kV line in Freeborn County. Studies indicate the line will be a required transmission upgrade for project G870, a 200 MW wind-powered generating facility currently connected to the 161 kV transmission system at Freeborn County switching station *CON App: 2014/2015* *Inservice Date: 2017/2018*
2013-SW-N4 *MISO MVP Project #3*	2011/A	3205	Yes	ITCM	New 345 kV line from Lakefield Junction through Jackson, Martin, and Faribult Counties, to new 345 kV substation in Kossuth County, IA. MVP #3 also includes 345 kV lines in IA from Kossuth Co. to Obrien Co. and Kossuth Co to Webster Co. MVP #3 lines include 161 kV rebuild as underbuild along portions of the route. *PUC Docket No. CN-12-1053* *Inservice Date: 2017*
2013-SW-N5 *Yankee – Fenton Reactors*	2013	4305	No	XEL	Install 25 MVAR reactors at Yankee and Fenton.
2013-SW-N6 *Veseli Project*	2013/C	4227	No	XEL	Install breaker station at Veseli 4 breakers straight bus interconnect with new double circuit 69kVGRE line from New Market.This project will align with GRE's New Market & Cleary lake projects

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2013-SW-N7 *Jordon Project*	2013/C	4228	No	XEL	Install 3 breakers at Jordan to avoid multi-terminal protection issue as a result of new GRE double circuit line from New Market.This project will align with GRE's Elko New Market & Cleary Lake Areas projects
2013-SW-N8 *Fort Ridgley Substation*	2013/seeking A	4341	No	XEL	Install a new 20 MVAR capacitor bank at the Fort Ridgley substation and increase the existing capacitor to 20 MVAR.

6.7.2 Completed Projects

Some inadequacies in the Southwest Zone that were identified in the 2011 Biennial Report were alleviated through the construction and completion of specific projects over the last two years or can be moved to the completed category because changed circumstances have eliminated the need for the project. Information about each of the completed projects is summarized briefly in the table below. More information about these projects and inadequacies can be found in the 2011 Biennial Report. Also, additional information is available by contacting the designated person for the utility that was responsible for constructing the project.

MPUC Tracking Number	MTEP Year/ App	MTEP Project Number	CON	Utility	Description	Date Completed PUC Docket
2009-SW-N2 *Fulda - Magnolia*	NA	NA	No	GRE	Lismore conversion to 115 kV	Cancelled. Delayed indefinitely due to drop in load growth and distribution co-op prefers to be served from 24 kV system.
2009-SW-N3 *Lakefield – Adams 345 kV Upgrade*	2011/B	3213	No	ITCM	Lakefield Adams 345 kV system upgrade	Cancelled. Replaced by MVP projects.
2009-SW-N4 *Redwood Falls Load Serving Substation*	2010/A	2167	No	SMP	Redwood Falls Area load-serving 115 kV project	October 2012

MPUC Tracking Number	MTEP Year/ App	MTEP Project Number	CON	Utility	Description	Date Completed PUC Docket
2011-SW-N7 *G491 Upgrades*	B	2115	No	XEL	One new 120 MVA, 118-36.2 kV transformer, three new 115 kV breakers and associated disconnect switches, one new 34.5 kV transformer low side main breaker and associated disconnect switches, control house expansion, structural steel and foundations associated with this new equipment, control and protection equipment associated with these new installations.	Project Cancelled.
2011-SW-N9 *G358 Winnebago Project*	2008/A	2108	No	ITCM	New 161 kV switching station in Faribault Co. on the Winnebago to Winnco 161 line to provide interconnection facilities for MISO Project G358.	June 2012
2011-SW-N10 *Sheas Lake Project*	2009/A	2156	No	XEL	1) New 345/115/69 kV Sheas Lake substation between Wilmarth and proposed Helena substation. 2) One mile of 69 kV double circuit to connect the existing LeSueur 69 kV lines into proposed Sheas Lake substation	April 2013 Same project as 2007-SE-N3

6.8 Southeast Zone

6.8.1 Needed Projects

The following table provides a list of transmission needs identified in the Southeast Zone by MISO utilities. There were no projects identified in this zone by non-MISO utilities.

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2005-SE-N4 *Dodge County Wind*	NA	NA	TBD	XEL	Additional outlet for possible future wind generation
2005-CX-3 *Hampton – La Crosse 345 kV Line*	2008 / A	1024	Yes	CapX	Add new 345 kV line between Southeast corner of Twin Cities, Rochester, and La Crosse Wisconsin. This line is located in the Twin Cities and Southeast Zones. *PUC Docket No. CN-06-1115 and TL-09-1448.* *Timeframe: under construction*
2011-SE-N1 *New Prague Substation*	2011/A	3313	No	XEL	This project is to install a 69 kV 1 way switch to provide SMMPA's New Prague substation a new interconnection point. The existing interconnection would require cutting the line jumpers when the New Prague - Veseli line is out of service.
2011-SE-N3 *Austin Area Load Serving*	2013/A	4007	No	SMP	Murphy Creek 161/69kV Substation. Expected in-service date: December 2013.
2011-SE-N5 *Arlington – Green Isle Rebuild*	2012/A		No	XEL	Re-build 13 miles of 69 kV line from Arlington – Green Isle. This is an underlying project associated with the MVP Brookings – Hampton 345 kV Line

MPUC Tracking Number	MTEP Year/App	MTEP Project Number	CON?	Utility	Project Description and Timeframe
2011-SE-N6 *Crystal Foods*	2012/A		No	XEL	New 5.4 MVAR capacitor bank at Crystal Foods in Arlington, MN.
2011-SE-N7 *Rochester Upgrades for CapX 2020*	2008/A	1024	Yes	XEL/ SMP/ Non-MISO	Add North Rochester - N. Hills 161 kV line. Add North Rochester-Chester 161 kV line. Add 345/161 kV transformers at Hampton Corner, North Rochester, and North Lacrosse.
2013-SE-N1 *Byron Transformer*	2013/C	4260	No	SMP	Byron TR9 345/161Transformer failed Aug 2012 and is now being replaced by a Non-LTC transformer. Expected in-service date: January 2014.

6.9 Completed Projects

Some inadequacies in the Southeast Zone that were identified in the 2011 Biennial Report were alleviated through the construction and completion of specific projects over the last two years or can be moved to the completed category because changed circumstances have eliminated the need for the project. Information about each of the completed projects is summarized briefly in the table below. More information about these projects and inadequacies can be found in the 2011 Biennial Report. Also, additional information is available by contacting the designated person for the utility that was responsible for constructing the project.

MPUC Tracking Number	MTEP Year/ App	MTEP Project Number	CON	Utility	Description	Date Completed PUC Docket
2007-SE-N3	2009	2156	No	XEL	1) New 345/115/69 kV Sheas Lake substation between Wilmarth and Proposed Helena substation. 2) 1 mile of 69 kV double circuit to connect the existing LeSueur 69 kV lines into proposed Sheas Lake substation.	April 2013 Same project as 2011-SW-N10

MPUC Tracking Number	MTEP Year/ App	MTEP Project Number	CON	Utility	Description	Date Completed PUC Docket
2009-SE-N2 *Mankato – Minnesota Lakes Area*	NA	NA	Yes	GRE	St. Clair-Loon Lake 115 kV line	Cancelled due to lack of load growth in the area and other alternatives being studied in Loon Lake-Owatonna area
2009-SE-N5 *St. Peter Area*	2010/A	2166	No	SMP	St Peter Area Load Serving 69 kV Project	June 2012
2011-SE-N2 *Adams Substation*	2011/A	3474	No	XEL	Installed a 50 MVAR reactor at Adams substation on the Pleasant Valley line, along with a breaker and disconnect switch	December 2012
2011-SE-N4 *MISO Project G870*	B	3195	No	ITCM	Upgraded Freeborn to Hayward 161 kV for MISO project G870.	April 2012
2011-SE-N8 *G362 Network upgrade*	2009/A	2178		XEL	New 161 kV line from Pleasant Valley - Byron 161 kV line	*2013*

7.0 Transmission-Owning Utilities

7.1 Introduction

In this chapter in the 2013 Report, the utilities have provided the following information.

Background Information and Contact Person

For ease of reference, the utilities have provided much of the same background information that was provided in the 2011 Report. This information relates to the history of the utility and the extent of its service territory and operations. An Internet link is provided where additional information about each utility can be found. In addition, a Contact Person is identified for each utility.

Transmission Line Ownership

In the 2007 Biennial Report, the utilities reported on the miles of transmission lines each utility owned in Minnesota. The MTO updated that information in subsequent biennial reports in 2009 and 2011, and they are updating it again in this report. The table below is the latest information on the transmission lines in Minnesota owned by each utility. In addition, information specific to each utility is included in the discussion for that utility.

Miles of Transmission

Utility	<100 kV	100-199 kV	200-299 kV	> 300 kV	DC
American Transmission Company, LLC	0.00	0.00	0.00	12.00	0.00
Dairyland Power Cooperative	423.80	148.00	0.00	0.00	0.00
East River Electric Power Cooperative	168.22	45.74	0.00	0.00	0.00
Great River Energy	3,044	517	533	166	436
Hutchinson Utilities Commission	8.00	9.00	0.00	0.00	0.00
ITC Midwest LLC	698.69	304.47	0.00	19.77	0.00
L&O Power Cooperative	44.52	8.32	0.00	0.00	0.00
Marshall Municipal Utilities	0.00	18.10	0.00	0.00	0.00
Minnesota Power	0.22	1,326.72	617.01	12.02	231.56
Minnkota Power Cooperative	997.34	143.80	268.10	0.00	0.00

Utility	<100 kV	100-199 kV	200-299 kV	> 300 kV	DC
Missouri River Energy Services	0.00	212.22	10.97	0.00	0.00
Northern States Power Company d/b/a Xcel Energy	1,554.50	1,577.00	143.70	1,368.80	0.00
Otter Tail Power Company	1,304.94	545.01	125.63	3.68	0.00
Rochester Public Utilities	0.00	42.42	0.00	0.00	0.00
Southern Minnesota Municipal Power Agency	138.50	135.38	17.09	0.00	0.00
Willmar Municipal Utilities	24.16	0.00	13.05	0.00	0.00
Totals:	8406.89	5033.18	1728.55	1582.27	667.56

7.2 American Transmission Company, LLC

Background information. American Transmission Co. began operations on Jan. 1, 2001, the first multi-state electric transmission-only utility in the country. The company is head-quartered in Pewaukee, Wis., with more than 600 employees working in Wisconsin and Michigan.

At least 28 utilities, municipalities, municipal electric companies, and electric cooperatives from Wisconsin, Michigan, and Illinois have invested transmission assets or money for an ownership stake in the company. ATC is responsible for operating and maintaining the transmission lines of its equity owners. It owns more than 9,480 circuit miles of transmission lines and 529 substations in Wisconsin, Michigan, Illinois, and Minnesota. ATC has $3.3 billion in total assets.

ATC is a transmission-owning member of the Midcontinent Independent System Operator and its transmission system is located in both the Midwest Reliability Organization and ReliabilityFirst Corporation.

More information about the company is available on its website at:

http://www.atcllc.com

Contact Person: Sonja Golembiewski,
Transmission Planning Engineer
American Transmission Co.
P.O. Box 47
Waukesha, WI 53187-0047
Phone: (262) 832-8660
Fax: (262) 506-6713
e-mail: sgolembiewski@atcllc.com

Transmission lines. ATC owns more than 9,480 miles of transmission lines, including 12 miles in Minnesota. The transmission line segment in Minnesota extends from the Arrowhead Substation in the Duluth area to the St. Louis River and is part of the 220-mile 345-kV Arrowhead-Weston line that extends from the Arrowhead Substation to the Gardner Park Substation in Wausau, Wis. The Arrowhead-Weston line, which cost $439 million to construct, was energized in January 2008. Arrowhead-Weston provides such benefits as improving reliability, enhancing transfer capacity between Minnesota and Wisconsin, and providing ATC and other utilities greater opportunities to perform maintenance on other parts of the electric system, which reduces operating costs.

7.3 Dairyland Power Cooperative

Background Information. Dairyland Power Cooperative, a Touchstone Energy Cooperative, was formed in December 1941. A generation and transmission cooperative, Dairyland provides the wholesale electrical requirements to 25 member distribution cooperatives and 19 municipal utilities in Wisconsin, Minnesota, Iowa and Illinois. Today, the cooperative's generating resources include coal, hydro, wind, natural gas, landfill gas and animal waste. In 2010, Dairyland Power Cooperative joined a larger regional transmission organization called the Midcontinent Independent System Operator (MISO).

More information about Dairyland Power Cooperative is available at:

http://www.dairynet.com

Contact Person: Steve Porter
Planning Engineer II
Dairyland Power Cooperative
3200 East Avenue South
La Crosse, WI 54601
Phone: (608) 787-1229
Fax: (608) 787-1475
e-mail: scp@dairynet.com

Transmission Lines. Dairyland delivers electricity via more than 3,100 miles of transmission lines and nearly 300 substations located throughout the system's 44,500 square mile service area. Dairyland has the following transmission facilities in Minnesota:

Dairyland Transmission Lines

<100 kV	100-199 kV	200-299 kV	>300 kV	DC
423.80	148.0	0	0	0

7.4 East River Electric Power Cooperative

Background Information. East River Electric Power Cooperative ("East River"), headquartered in Madison, South Dakota, is a wholesale electric power supply and transmission cooperative serving 20 rural distribution electric cooperatives and one municipally-owned electric system, which in turn serve more than 86,000 homes and businesses. East River's 36,000 square mile service area covers the rural areas of 41 counties in eastern South Dakota and nine counties in western Minnesota.

Two of East River's member systems have service areas entirely in western Minnesota and one member system has service areas in both eastern South Dakota and western Minnesota, The remaining nineteen member systems have service areas entirely in eastern South Dakota. Approximately 7,600 of the 86,000 homes and businesses served by East River's 21 member systems are located in Minnesota.

More information about East River Electric Power Cooperative is available at:

http://www.eastriver.coop

Contact Person: Mark Hoffman
Engineering Services Manager
East River Electric Power Cooperative
P.O. Box 227
211 South Harth Avenue
Madison, SD 57042
Phone: (605) 256-4536
Fax: (605) 256-8058
e-mail: mhoffman@eastriver.coop

Transmission Lines. East River delivers electricity via approximately 2,900 miles of transmission lines and 213 substations located throughout the system's 36,000 square mile service area in eastern South Dakota and western Minnesota. East River has the following transmission facilities in Minnesota:

East River Electric Power Cooperative Transmission Lines

<100 kV	100-199 kV	200-299 kV	>300 kV	DC
168.22	45.74	0	0	0

7.5 Great River Energy

Background Information. Great River Energy ("GRE") is a not-for-profit electric cooperative owned by 28 member distribution cooperatives. The organization generates and transmits electricity for those members, which are located from the outer-ring suburbs of the Twin Cities, up to the Arrowhead region of Minnesota and down to the farming communities in the southwest part of the state. Great River Energy's largest distribution cooperative serves more than 125,000 member-consumers, while the smallest serves approximately 2,500. Collectively, Great River Energy's member cooperatives distribute electricity to approximately 655,000 member accounts, or about 1.7 million people. In addition, Great River Energy is part of a larger regional transmission organization called the Midcontinent Independent System Operator (MISO).

More information about Great River Energy is available at:

http://www.greatriverenergy.com

Contact Person: Gordon Pietsch
Director, Transmission Planning & Operations
Great River Energy
12300 Elm Creek Blvd
Maple Grove, MN 55369-4718
Ph: (888) 521-0130, ext. (763) 445-5050
Fax: (763) 445-5050
e-mail: gpietsch@grenergy.com

Transmission Lines. Great River Energy has the following transmission lines:

GRE Transmission Lines

<100 kV	100-199 kV	200-299 kV	>300 kV	DC
3,044	517	533	166	436

7.6 Hutchinson Utilities Commission

Background Information. The City of Hutchinson is located 55 miles west of Minneapolis in McLeod County and has a population of approximately 14,000 people. The area is expected to continue to grow over the next decade. The Hutchinson Utilities Commission was established in 1936 by the City of Hutchinson as a municipal public utilities commission under Minn. Stat. §§ 412.321 et seq., and added a municipal natural gas operation in 1960. HUC provides electricity and natural-gas services to commercial and residential customers in Hutchinson. Its largest commercial customers are 3M and Hutchinson Technologies, Inc. HUC transmission facilities are under the functional control of the Midcontinent Independent System Operator (MISO).

Additional information is available at:

http://www.ci.hutchinson.mn.us/util.htm

Contact Person: Michael Kumm
Hutchinson Utilities Commission
225 Michigan Street SE
Hutchinson, MN 55350
Phone: (320) 587-4746
Fax: (320) 587-4721
e-mail: mkumm@ci.hutchinson.mn.us

Transmission Lines. Hutchinson Utilities Commission owns 8 miles of a 69 kV transmission line and 9 miles of a 115 kV line in McLeod County.

7.7 ITC Midwest LLC

Background Information: ITC Midwest LLC ("ITC Midwest") is an independent transmission company subsidiary of ITC Holdings Corp. ITC Midwest purchased the transmission assets of Interstate Power and Light, a subsidiary of Alliant Energy, in December 2007. The Minnesota Public Utilities Commission approved the sale in an Order dated February 7, 2008. PUC Docket No. PA-07-540.

ITC Midwest has headquarters in Cedar Rapids, Iowa, and ITC Holdings Corp. is headquartered in Novi, Michigan. ITC Midwest also has offices in Dubuque and Des Moines, Iowa, and in St. Paul, Minnesota. Minnesota warehouses are located in Albert Lea and Lakefield, Minnesota. In addition, ITC Midwest's transmission system is part of a larger regional transmission system called the Midcontinent Independent System Operator (MISO.)

More information about ITC Midwest and ITC Holdings Corp. can be found at:

http://www.itctransco.com

Contact Person: David Grover
Manager, Regulatory Strategy
444 Cedar Street - Suite 1020
St Paul, MN 55101
Phone: 651-222-1000 extension 2308
Fax: 651-222-5544
e-mail: DGrover@itctransco.com

Transmission Lines. The ITC Midwest system includes approximately 6,600 miles of transmission lines, operating at voltages from 34.5 kV to 345 kV in Minnesota, Iowa, Illinois, and Missouri.

ITC Midwest owns approximately 1,023 miles of transmission line in the state of Minnesota, operating at voltages of 345 kV, 161 kV and 69 kV. The total miles of these transmission lines are listed by voltage class in the table below.

ITC Midwest Transmission Lines

<100 kV	100-199 kV	200-299 kV	>300 kV	DC
698.69	304.47	0	19.77	0

7.8 L&O Power Cooperative

Background Information. L & O Power Cooperative ("L&O"), headquartered in Rock Rapids, Iowa, is a wholesale electric power supply and transmission cooperative serving three rural distribution electric cooperatives. These member cooperatives in turn serve more than 5,600 homes and businesses across Rock and Pipestone counties in southwest Minnesota, and Lyon and Osceola counties in northwest Iowa. Approximately 2,700 of the total 5,600 total consumers served are located in Minnesota.

Additional information about L&O is available at:

http://www.landopowercoop.com

Contact Person: Curt Dieren
Manager
L&O Power Cooperative
P.O. Box 511
1302 S. Union Street
Rock Rapids, IA 51246
Phone: (712) 472-2556
Fax: (712) 472-2710
e-mail: CDieren@dgrnet.com

Transmission Lines. L&O delivers wholesale electricity via approximately 193 miles of transmission lines and 16 substations located throughout the system's four county service area in southwestern Minnesota and northwestern Iowa. L&O has the following transmission facilities in Minnesota:

L&O Power Cooperative Transmission Lines

<100 kV	100-199 kV	200-299 kV	>300 kV	DC
44.52	8.32	0	0	0

7.9 Marshall Municipal Utilities

Background Information. Marshall Municipal Utilities (MMU) has been providing electric and water utility services to the City of Marshall for over 117 years. Marshall is a community of approximately 13,680 people located in Lyon County in Southwest Minnesota approximately 30 miles east of the South Dakota border and 50 miles north of the Iowa border. MMU is the second largest municipal utility in the state in terms of retail energy sales at over 614,000 MWhs sold in 2011. MMU serves over 6,500 customers and has a peak demand of just under 90 megawatts.

More information about MMU is available at:

http://www.marshallutilities.com/about

Contact Person: Brad Roos
Marshall Municipal Utilities
113 4th Street South
Marshall, MN 56258-1223
Phone: (507) 537-7005
Fax: (507) 537-6836
e-mail: bradr@marshallutilities.com

Transmission Lines. Marshall Municipal Utilities owns 18.1 miles of 115 kV transmission line.

7.10 Minnesota Power

Background Information. Minnesota Power (MP), a division of ALLETE, is an investor-owned utility headquartered in Duluth, Minnesota. Minnesota Power provides electricity in a 26,000-square-mile electric service territory located in northeastern Minnesota. Minnesota Power supplies retail electric service to 144,000 retail customers and wholesale electric service to 16 municipalities. MP's transmission and distribution components include 8,472 miles of lines and 164 substations. Minnesota Power's transmission network is interconnected with the transmission grid to promote reliability and is part of a larger regional transmission organization called the Midcontinent Independent System Operator (MISO).

More information is available on the company's web page at:

http://www.mnpower.com

Contact Person: Christian Winter
Engineer
Minnesota Power
30 West Superior Street
Duluth, MN 55802
Phone: (218) 355-2908
e-mail: cwinter@mnpower.com

Transmission Lines. The number of miles of transmission in Minnesota owned by Minnesota Power is shown in the following table.

Minnesota Power Transmission Lines

<100 kV	100-199 kV	200-299 kV	>300 kV	DC
0.22	1,326.72	617.01	12.02	231.56

7.11 Minnkota Power Cooperative

Background Information. Minnkota Power Cooperative, Inc. (Minnkota, or MPC) is a regional generation and transmission cooperative serving 11 member-owner distribution cooperatives in eastern and northwestern Minnesota and northeastern North Dakota. Minnkota's service area is approximately 34,500 square miles over the two states. Minnkota is also the operating agent for the Northern Municipal Power Agency (NMPA), an association of 12 municipal utilities in the same service region. Together Minnkota and the NMPA comprise the Joint System and serve more than 135,000 consumers.

Additional information about Minnkota is available at:

http://www.minnkota.com

Contact Person: Tim Bartel
Senior Manager, Transmission Planning
Minnkota Power Cooperative, Inc.
P.O. Box 13200
Grand Forks, ND 58208-3200
Phone: (701) 795-4314
Fax: (701) 795-4333
e-mail: tbartel@minnkota.com

Transmission Lines. The Joint System owns 1,409.24 miles of transmission line in Minnesota and 1680.82 miles in North Dakota. The miles of Minnesota transmission lines are shown in the following table:

Joint System Transmission Lines

<100 kV	100-199 kV	200-299 kV	>300 kV	DC
997.34	143.80	268.10	0	0

7.12 Missouri River Energy Services

Background Information. MRES began in the early 1960s as an informal association of northwest Iowa municipalities with their own electric systems that decided to coordinate their efforts in negotiating the purchase of power and energy from the United States Bureau of Reclamation of the United States Department of the Interior ("USBR"). MRES was established as a body corporate and politic organized in 1965 under Chapter 28E of the Iowa Code and existing under the intergovernmental cooperation laws of the states of Iowa, Minnesota, North Dakota, and South Dakota. Municipalities in Minnesota, North Dakota and South Dakota subsequently joined MRES pursuant to compatible enabling legislation in each state.

MRES is comprised of 61 municipally owned electric utilities in the States of Iowa, Minnesota, North Dakota, and South Dakota. The MRES member cities' service territories roughly coincide with the boundaries of the respective incorporated cities. MRES has no retail load, and all of its firm sales are made to municipal or other wholesale utilities. MRES acts as an agent for the Western Minnesota Municipal Power Agency ("WMMPA"), which itself was incorporated as a municipal corporation and political subdivision of the State of Minnesota. WMMPA provides a means for its members to secure, by individual or joint action among themselves or by contract with other public or private entities within or outside the State of Minnesota, an adequate, economical and reliable supply of electric energy. Current membership in WMMPA consists of 23 municipalities located in Minnesota, each of which owns and operates a utility for the local distribution of electricity. In addition, MRES is part of a larger regional transmission organization called the Midcontinent Independent System Operator (MISO).

More information about Minnesota River Energy can be found at:

http://www.mrenergy.com

Contact Person: Brian Zavesky
Missouri River Energy Services
3724 West Avera Drive
P.O. Box 88920
Sioux Falls, SD 57108-8920
Phone: (605) 330-6986
Fax: (605) 978-9396
e-mail: brianz@mrenergy.com

Transmission Lines. Missouri River Energy Services has 212.22 miles of 115 kV transmission lines and 10.97 miles of 230 kV transmission line in Minnesota.

7.13 Northern States Power Company

Background Information. Northern States Power Company, a Minnesota corporation (NSP), is a public utility organized under the laws of the State of Minnesota, and is a wholly-owned subsidiary of Xcel Energy Inc., a publicly-traded company listed on the New York Stock Exchange. NSP is headquartered in Minneapolis, Minnesota. Xcel Energy Inc.'s other utility subsidiaries are Northern States Power Company, a Wisconsin corporation (NSPW), headquartered in Eau Claire, Wisconsin, Public Service Company of Colorado, headquartered in Denver, Colorado, and Southwestern Public Service Company, headquartered in Amarillo, Texas. NSP provides electricity and natural gas to customers in a service territory that encompasses the Twin Cities, many mid-size and small towns throughout Minnesota, and also to portions of South Dakota and North Dakota. NSP and NSPW operate an integrated generation and transmission system (the NSP System). In addition, Northern States Power Company is part of a larger regional transmission organization called the Midcontinent Independent System Operator (MISO.)

More information can be found on Xcel Energy's web page at:

http://www.xcelenergy.com

Contact Person: Paul J. Lehman
Manager, Regulatory Administration
414 Nicollet Mall
Minneapolis, MN 55401
Phone: (612) 330-7529
Fax: (612) 573-9315
e-mail: paul.lehman@xcelenergy.com

Transmission Lines. Northern States Power Company owns over 4,500 miles of transmission lines in Minnesota. The miles of Minnesota transmission lines are shown in the following table.

NSP Transmission Lines

<100 kV	100-199 kV	200-299 kV	>300 kV	DC
1,554.50	1,577.00	143.70	1,368.80	0.00

7.14 Otter Tail Power Company

Background Information. Otter Tail Power Company is an investor-owned electric utility headquartered in Fergus Falls, Minnesota, and a subsidiary of Otter Tail Corporation (NASDAQ Global Select Market: OTTR). It provides electricity and energy services to more than 125,000 residential, commercial, and industrial customers in a service territory of 70,000 square miles that cover over 400 communities throughout Minnesota, South Dakota, and North Dakota, with approximately 60,600 customers in Minnesota. The company was originally incorporated in 1907, and first delivered electricity in 1909 from the Dayton Hollow Dam on the Otter Tail River. In addition, Otter Tail Power Company is part of a larger regional transmission organization called the Midcontinent Independent System Operator (MISO).

To learn more about Otter Tail Power Company visit www.otpco.com. To learn more about Otter Tail Corporation visit www.ottertail.com.

Contact Person: Michael Riewer
Supervisor, Delivery Studies
Otter Tail Power Company
P.O. Box 496
Fergus Falls, MN 56538-0496
Phone: (218) 739-8200
Fax: (218) 739-8442
e-mail: MRiewer@otpco.com

Transmission Lines. OTP has the following transmission lines in Minnesota:

OTP Transmission Lines

<100 kV	**100-199 kV**	**200-299 kV**	**>300 kV**	**DC**
1,304.94	545.01	125.63	3.68	0

7.15 Rochester Public Utilities

Background Information. Rochester Public Utilities (RPU), a department of the City of Rochester, Minnesota, is the largest municipal utility in the state of Minnesota. RPU serves roughly 48,219 electric customers. In 1978, Rochester joined the Southern Minnesota Municipal Power Agency (SMMPA) with City Council approval. Initially, RPU was a full-requirements member with SMMPA controlling all of Rochester's electric power. Today, RPU is a partial requirements member of SMMPA and retains control over its own generating units. All of RPU's load and generation are serviced by the Midwest Independent Transmission System Operator (MISO) through its market function. RPU's Planning Coordinator for transmission is the Mid-Continent Area Power Pool (MAPP). MISO is RPU's Reliability Coordinator via contract.

More information about Rochester Public Utilities is available at:

http://www.rpu.org/about

Contact Person: Scott Nickels
Manager of System Operations/Reliability
Rochester Public Utilities
4000 East River Road NE
Rochester, MN 55906
Phone: (507) 280-1585
Fax: (507) 280-1542
e-mail: snickels@rpu.org

Transmission Lines. Rochester Public Utilities owns 42.42 miles of 161 kV transmission line in Minnesota. Rochester Public Utilities is one of the eleven members of the CapX2020 group, and is one of the five investors in the Hampton-Rochester-La Crosse CapX2020 project. Beyond this CapX2020 project, Rochester Public Utilities has no immediate plans for future transmission expansion.

7.16 Southern Minnesota Municipal Power Agency

Background Information. Southern Minnesota Municipal Power Agency ("SMMPA") is a not-for-profit municipal corporation and political subdivision of the State of Minnesota, headquartered in Rochester, Minnesota. SMMPA was created in 1977, and has eighteen municipally owned utilities as members, located predominantly in south-central and southeastern Minnesota. SMMPA serves approximately 112,100 retail customers. In addition, SMMPA is part of a larger regional transmission organization called the Midcontinent Independent System Operator (MISO).

More information about SMMPA is available at:

http://www.smmpa.com

Contact Person: Richard Hettwer
PE, MBA
Manager of Power Delivery
Southern Minnesota Municipal Power Agency
500 First Avenue Southwest
Rochester, MN 55902-3303
Phone: (507) 292-6451
e-mail: rj.hettwer@smmpa.org

Transmission Lines. Southern Minnesota Municipal Power Agency has the following transmission lines in Minnesota:

SMMPA Transmission Lines

<100 kV	100-199 kV	200-299 kV	>300 kV	DC
138.50	135.38	17.09	0	0

7.17 Willmar Municipal Utilities

Background Information. Willmar, a regional center for West Central Minnesota, is located 100 miles west of the Twin Cities. It is the Kandiyohi County Seat with a population of 19,000. Willmar Municipal Utilities maintains an electric system that currently has four substations with 190 miles of distribution lines and 35 miles of transmission lines.

Additional information is available at:

http://wmu.willmar.mn.us

Contact Person: Wesley Hompe
General Manager
P.O. Box 937
700 Litchfield Avenue SW
Willmar, MN 56201
Phone: (320) 235-4422
Fax: (320) 235-3980
e-mail: wmu@wmu.willmar.mn.us

Transmission Lines. Willmar Municipal Utilities owns 24.16 miles of 69 kV transmission line and 13.05 miles of 230 kV transmission line in Minnesota.

8.0 Renewable Energy Standards

8.1 Introduction

Minnesota Statutes § 216B.2425, subd. 7, states that in the Biennial Report the utilities shall address necessary transmission upgrades to support development of renewable energy resources required to meet upcoming Renewable Energy Standard milestones. In its May 30, 2008, Order approving the 2007 Biennial Report and Renewable Energy Standards Report, the Commission said, "Future biennial transmission projects reports shall incorporate and address transmission issues related to meeting the standards and milestones of the new renewable energy standards enacted at Minn. Laws 2007, ch. 3."

In this Report, as in past years, the utilities are reporting on their best estimates for how much renewable generation will be required in future years and what efforts are underway to ensure that adequate transmission will be available to transmit that energy to the necessary market areas. A Gap Analysis is provided to illustrate the amount of renewable generation that is already available and how much will be required in the future to meet the standard.

8.2 Reporting Utilities

It should be pointed out, as was done in previous reports, that the utilities that are required to submit the Biennial Transmission Projects Report are not identical to those that are required to meet the Renewable Energy Standards. The information in this chapter reflects the work of all the utilities that are required to meet RES milestones, regardless of whether they own transmission lines and are required to participate in the Biennial Report. A list of those utilities participating in the Biennial Transmission Projects Report can be found in Chapter 2.0. The utilities participating in this part of the 2013 Biennial Report on renewable energy are the following.

Investor-owned Utilities

- Interstate Power and Light Company
- Minnesota Power
- Northern States Power Company
- Otter Tail Power Company

Generation and Transmission Cooperative Electric Associations

- Basin Electric Power Cooperative
- Dairyland Power Cooperative
- East River Electric Power Cooperative
- Great River Energy
- L&O Power Cooperative
- Minnkota Power Cooperative

Municipal Power Agencies

Central Minnesota Municipal Power Agency
Minnesota Municipal Power Agency
Southern Minnesota Municipal Power Agency
Western Minnesota Municipal Power Agency/Missouri River Energy Services

Power District

Heartland Consumers Power District

8.3 Compliance Summary

The utilities have continued to make substantial progress with respect to meeting future RES milestones. The present analysis shows that the utilities are on course to meet the RES milestone for 2016. There is no statutory milestone for 2014 but the utilities have included figures for 2014 to provide the most recent base year, consistent with past reports. The analysis continues to show that the CapX2020 Group 1 projects are crucial to meeting the 2016 Minnesota RES and non-Minnesota RES milestones. The utilities recognize that additional transmission and generation will be necessary for 2020 and beyond in Minnesota, and that other demands for renewable energy will impact Minnesota's compliance status.

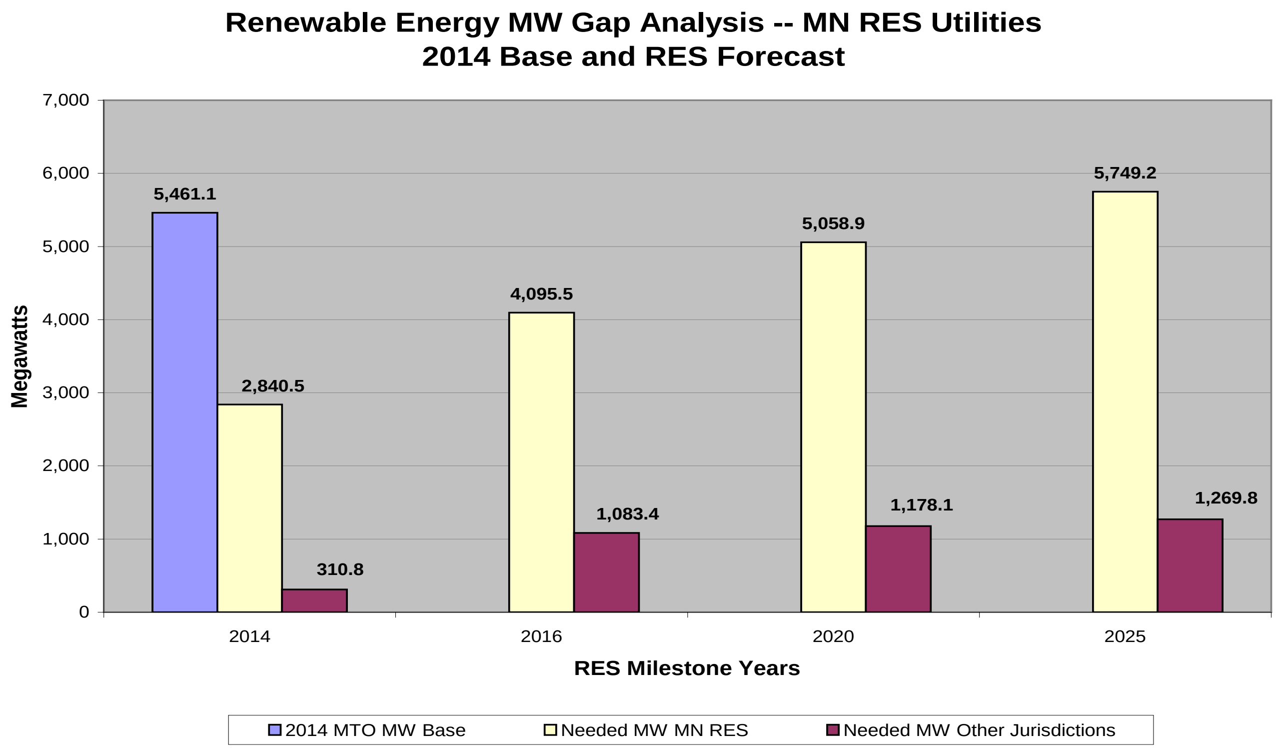
8.4 Gap Analysis

A Gap Analysis is an estimate of how many more megawatts of renewable generating capacity a utility expects to need beyond what is presently available to obtain the required amount of renewable energy that must come from renewable sources at a particular time in the future. A Gap Analysis is not an exercise intended to verify the validity of forecasted energy sales and associated capacity needs. It is done for transmission planning purposes only. This is the fourth time the utilities have prepared a Gap Analysis; a Gap Analysis was prepared for the 2007, 2009 and 2011 Biennial Reports also.

8.5 Base Capacity and RES/REO Forecast

The chart below presents a system-wide overview of existing capacity in 2014 (used as a base figure throughout the various milestone periods) and forecasted renewable capacity requirements to meet Minnesota RES as well as non-Minnesota RES/REO needs. Each utility provided its own forecast of Minnesota RES and non-Minnesota RES/REO renewable energy needs, and converted such estimates into capacity based on their own mix of renewable resources (wind, biomass, hydropower) using the most appropriate capacity factors unique to their specific generating resources.

Table 1 on the following page shows a more specific breakdown of each utility's Minnesota RES and non-Minnesota RES/REO needed capacity forecast.



2014 MTO MW Base: RES capacity acquired, actually installed and operational ("in the ground and running") regardless of geographic location. Does not include projects under contract but not yet under construction, and it does not include projects under construction but not yet completed.
Needed MW MN RES: Renewable capacity required to meet the RES energy goals for each utility serving customers in Minnesota.
Needed MW Other Jurisdictions: Gross non-MN renewable capacity required to meet RES requirements or REO goals in states served by the reporting utility other than Minnesota.

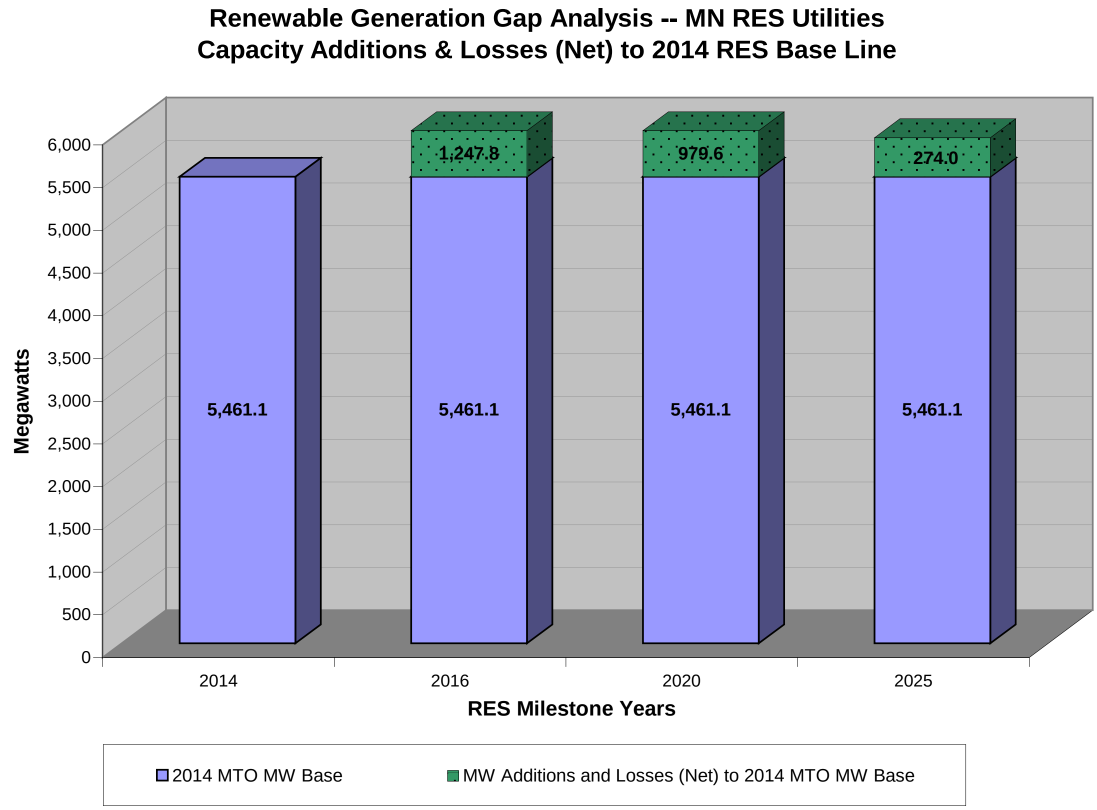
Table 1. MN & Non-MN RES Need Forecast (MW)[1]

Utility	2014		2016		2020		2025	
	MN RES	Non-MN RES	MN RES	Non-MN RES	MN RES	Non-MN RES	MN RES	Non-MN RES
Basin Electric[2]	38.9	16.3	59.4	363.3	81.4	438.4	121.2	491.3
CMMPA	14.0	-	20.0	-	27.0	-	39.0	-
Dairyland	22.2	31.9	32.3	60.6	39.8	63.7	52.9	67.7
GRE	351.0	0.4	518.0	1.5	617.0	1.5	827.0	1.5
Heartland	15.4	-	12.7	5.5	3.9	5.7	5.0	6.0
IPL	33.4	49.8	48.1	49.8	59.0	49.8	77.4	49.8
Minnkota	58.0	-	85.0	93.0	107.0	100.0	147.0	109.0
MMPA	48.5	-	68.9	-	98.5	-	127.6	-
MN Power	419.0	9.6	579.4	17.3	696.3	-	826.9	-
Otter Tail	72.0	-	120.7	67.8	158.1	71.3	196.6	75.8
SMMPA	109.5	-	161.1	-	201.6	-	269.1	-
WMMPA/MRES	44.0	33.0	75.0	39.0	107.0	42.0	140.0	45.0
Xcel Energy	1,614.7	169.8	2,315.0	385.5	2,862.4	405.7	2,919.5	423.7
TOTAL	2,840.5	310.8	4,095.5	1,083.4	5,058.9	1,178.1	5,749.2	1,269.8

Note:
1. Capacity factor assumptions established by each utility
2. These quantities include Basin Electric Power Cooperative, L&O Power Cooperative, and East River Electric Power Cooperative

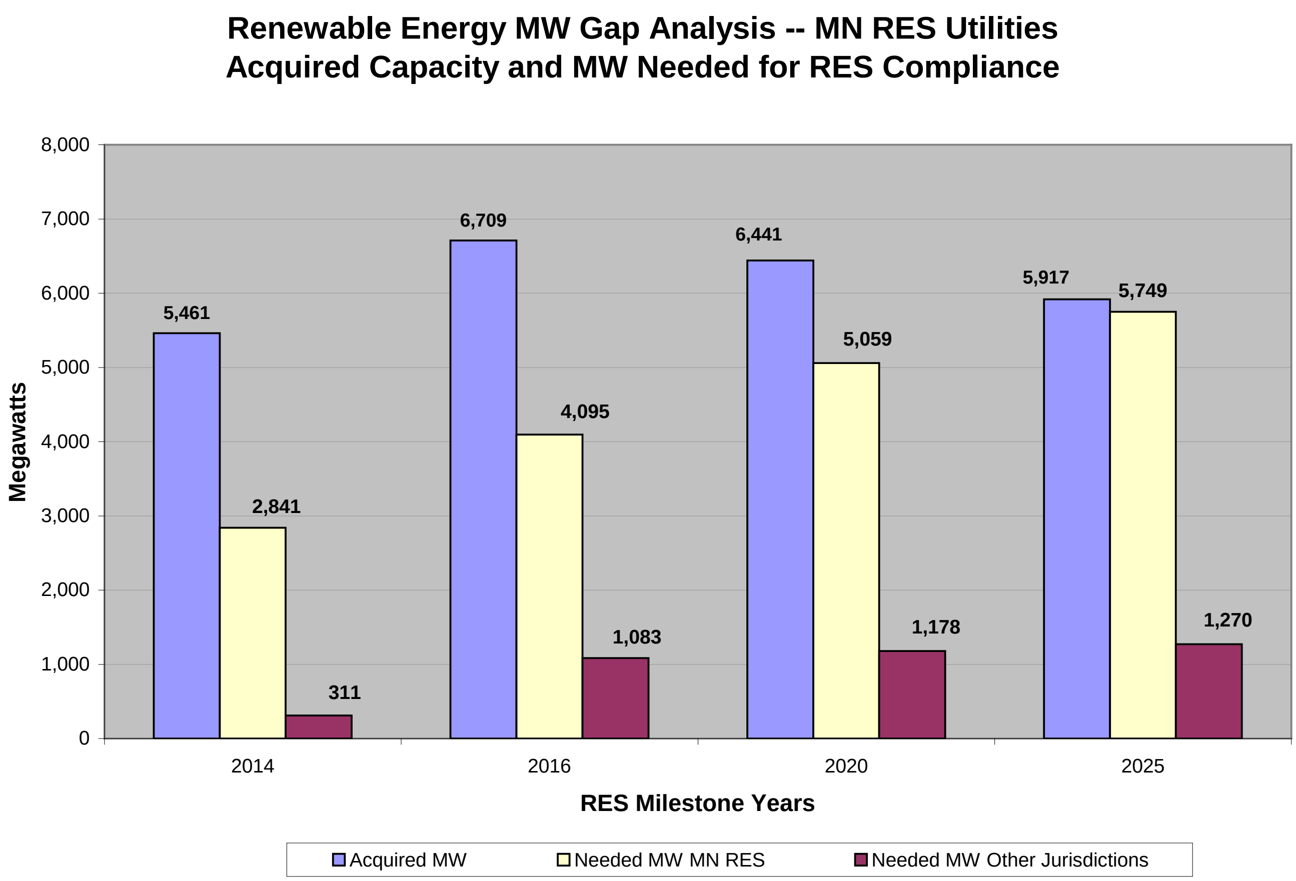
8.5.1 Capacity Acquisitions & Expirations

This chart presents a system-wide overview of additional renewable capacity that will be acquired by individual utilities beginning as early as 2014 and capacity that will expire between 2016 and 2025. Such losses are attributable primarily to the expiration of various power purchase agreements for renewable energy generation.



8.5.2 RES Capacity Acquired and Net RES/REO Need

This chart represents the total renewable capacity system-wide that will be acquired and lost between 2014 and 2025, as well as the total Minnesota RES and non-Minnesota RES/REO needs between 2014 and 2025.



As can be seen, the Minnesota RES utilities have sufficient capacity acquired to meet the Minnesota RES needs through 2025. When considering the RES needs, including other jurisdictions outside of Minnesota, the Minnesota RES utilities have enough capacity to meet RES needs beyond 2020. In addition, some utilities with less than sufficient capacity to meet the Minnesota RES need may use renewable energy credits to fulfill their requirement.

Focusing back on just Minnesota RES needs, Table 2 below provides a more specific breakdown of each utility's forecast.

Table 2. RES Capacity Acquired & Net MN RES Capacity Need (MW)[1]

Utility	2014		2016		2020		2025	
	RES Cap Acq.	MN RES Net	RES Cap Acq.	MN RES Net	RES Cap Acq.	MN RES Net	RES Cap Acq.	MN RES Net
Basin Electric [2]	738.3	-	738.3	-	738.3	-	731.0	-
CMMPA	33.6	-	33.6	-	33.6	-	27.6	11.4
Dairyland	125.9	-	125.9	-	125.9	-	125.9	-
GRE	508.0	-	506.0	-	491.0	-	488.0	-
Heartland	34.0	-	32.0	-	30.0	-	30.0	-
IPL	25.2	(8.2)	25.1	(23.0)	23.5	(35.5)	21.5	(56.0)
Minnkota	359.0	(303.0)	359.0	(274.0)	359.0	(252.0)	359.0	(212.0)
MMPA	246.6	-	263.3	-	164.8	-	51.4	76.3
MN Power	650.8	-	844.2	-	832.8	-	832.8	-
Otter Tail	196.6	-	259.0	-	259.0	-	259.0	-
SMMPA	119.3	-	119.3	41.8	119.3	82.3	119.3	149.8
WMMPA/MRES	85.3	(41.3)	85.3	(10.3)	121.4	(14.4)	121.4	18.4
Xcel Energy	2,338.5	-	3,318.0	-	3,142.3	125.8	2,750.4	592.8
TOTAL[3]	5,461.1	(352.5)	6,708.9	(265.5)	6,440.8	(93.8)	5,917.2	580.6

Note:
1. Capacity factor assumptions established by each utility
2. These quantities include Basin Electric Power Cooperative, L&O Power Cooperative, and East River Electric Power Cooperative
3. Some Utilities with less than sufficient capacity to meet the MN RES need may use renewable energy credits to fulfill their requirement.

Note that the "Needed MW MN RES" bar in the bar chart in this section represents the total level of RES need in Minnesota. Conversely, the column in Table 2 that is labeled "MN RES Net" represents the additional RES capacity that is presently identified to meet RES need (a negative value means the utility has a surplus of RES capacity). The shortfall, or "gap", between MN

RES need and the additional RES capacity identified points to the need for some utilities to seek additional renewable capacity and when they need to do so. Alternatively, some utilities may use renewable energy credits to fulfill their RES requirements.

8.6 Solar Energy Standard

In 2013, the Minnesota Legislature established a separate solar standard for public utilities, effective by the end of 2020. Minn. Laws 2013, Ch. 85, § 3, codified at Minnesota Statutes § 216B.1691, subd. 2f (Solar energy standard). That statute requires public utilities subject to the solar standard to report to the Public Utilities Commission on July 1, 2014, and each July thereafter, on progress in achieving the standard. While this legislation is new and the Commission has not required information on compliance with it to be included in the Biennial Report, Northern States Power Company has included a brief analysis of its anticipated needs for solar energy in future years as part of this report.

Table 3 below provides the level of solar capacity Northern States Power Company forecasts will be needed by the indicated years. When this is combined with the needs for the RES requirements, the Total shown provides the total level of renewable resources Northern States Power Company needs.

Table 3. Northern States Power MN & Non-MN RES and SES* Forecast (MW)

	2014		2016		2020		2025	
	MN	Non-MN	MN	Non-MN	MN	Non-MN	MN	Non-MN
RES	1,615.0	170.0	2,315.0	386.0	2,862.0	406.0	2,920.0	424.0
SES	-				269.0		274.0	
TOTAL	1,615.0	170.0	2,315.0	386.0	3,131.0	406.0	3,194.0	424.0

* SES is the new MN Solar Energy Standard which will require additional solar on the NSP system beyond the MN RES Requirements

Table 4 below Provides Northern States Power Company’s planned level of solar capacity additions. Once again when this is combined with the planned additions for the RES requirements, the Total shown provides the total level of renewable resources Northern States Power Company plans on acquiring by the listed years.

Table 4. NSP RES & SES* Capacity Acquired & Net MN Capacity Need (MW)

	2014		2016		2020		2025	
	Cap Acq.	MN Net	Cap Acq.	MN Net	Cap Acq.	MN Net	Cap Acq.	MN Net
RES	2,338.5	-	3,318.0	-	3,142.3	125.8	2,750.4	592.8
SES	-	-	85.0	-	275.6	-	275.6	-
TOTAL	2,338.5	-	3,403.0	-	3,417.9	125.8	3,026.0	592.8
* SES is the new MN Solar Energy Standard which will require additional solar on the NSP system beyond the MN RES requirements.								

8.7 Corridor Upgrade Project

The 2011 Biennial Report included a report on the Corridor Upgrade Project, in response to the Commission's Order of May 28, 2010, approving the 2009 Biennial Report, to include such a report in the 2011 Report.

The Corridor Upgrade Project is an upgrade of the 230 kV line between the Hazel Creek Substation near Granite Falls, Minnesota, and the Blue Lake Substation in Shakopee, Minnesota to a double circuit 345 kV system. This upgrade would provide significant new transmission capacity from the Dakotas, southwestern Minnesota and western Minnesota to the Twin Cities, at a cost estimated in 2009 to be approximately $350 million.

As reported in the 2011 Biennial Report, the Corridor Upgrade Project was initially expected to be needed in the 2016-2018 timeframe based on constructability and ability to take transmission system outages as the generation delivery from SW Minnesota increased, and was expected to be the next transmission project pursued after the CapX2020 Group 1 lines. However, because of the addition of the MISO MVP Group 1 portfolio of projects, which was approved by the MISO Board of Directors in December 2011, the timeframe for the Corridor Upgrade Project was pushed out beyond 2018.

In its May 18, 2012, Order approving the 2011 Biennial Report, the Commission again directed the utilities to include an update on the Corridor Upgrade Project. That status of the Corridor Upgrade Project has not changed. This Project is likely to not be required until well beyond 2018.