

## Chapter 10. Transmission

The transmission system plays an integral role in implementing any Resource Plan, as the generation is dependent upon the availability of an adequate transmission system to deliver energy to our customers. While transmission planning is considered separately, Xcel Energy recognizes that transmission development is an important part of the resource planning process. As a result, we provide this update on current and anticipated transmission efforts that are related to our proposed plan.

### Overview

Existing capacity on the transmission system remains constrained. As reported in our last Resource Plan filing, the transmission grid is still operating at or near maximum capacity. The Technical Review Committee for Phase II of the Minnesota Dispersed Renewable Generation (“DRG”) Study said as much in its September 15, 2009 report:

The DRG Phase II study team encountered many of the same challenges as other recent transmission study teams have found: the transmission system is stressed and the generation interconnection queue has an abundance of requests. The grid is at its design capacity which causes congestion. For the year 2013 model there are significant base case transmission facility overloads as a consequence of anticipated generation additions. These overloads may need to be addressed even without any additional generation, DRG or otherwise. As such, these constraints are not uniquely the result of new DRG possibilities, but rather **any generation additions of any size will add to the transmission overload concerns.**<sup>1</sup> (emphasis in original)

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<sup>1</sup> DRG Phase II study, page 14

Although relieving these constraints requires overcoming numerous challenges, progress is being made. The Commission has approved certificates of need for the four Phase I CapX2020 lines and routing decisions have begun to be made with a route selected for the Monticello-St. Cloud 345 kV line and for most of the Brookings County – Hampton Corner 345 kV project. In addition, we continue to work with Midwest Independent System Operator (“MISO”) to remove barriers to the efficient development of generation and transmission. While we are pleased to report that progress is being made, additional transmission will be needed to support our Resource Plan.

In this chapter, we outline the transmission planning efforts being undertaken consistent with the Commission’s Biennial Transmission Plan process to meet the growth in demand and generation needed over the period covered by this Resource Plan (MPUC Docket No. E999/M-09-602). We provide the Commission with updates on: (i) status of the CapX2020 Group 1 transmission line projects; (ii) the Biennial Transmission Plan process; (iii) recent developments at MISO that impact our Resource Plan; and (iv) a number of other issues relating to the transmission system, including issues regarding the addition of intermittent resources such as wind.

## CapX 2020

The Commission recently granted certificates of need for each of the four CapX2020 Group 1 Projects.<sup>2</sup> These four projects are the first step of a coordinated transmission development effort by a group of regional utilities (the “CapX2020 Utilities”). The Group 1 projects include three 345 kV projects and one 230 kV project. The approximate lengths and general location of the proposed lines, as approved by the Commission in its orders granting certificates of need for the projects, are as follows:

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<sup>2</sup> On May 22, 2009, the Commission approved certificate of need applications submitted by Xcel Energy and Great River Energy for three 345 kV projects in MPUC Docket No. ET2, E002/CN-06-1115. The Commission required that all three 345 kV lines be “double-circuit capable,” that is, constructed in a way that will facilitate a second 345 KV circuit on the same set of transmission towers. A certificate of need was granted for the 230 kV Bemidji project was granted by the Commission July 14, 2009, in MPUC Docket No. E017, E015, ET6/CN-07-1222.

- **Fargo Project:** An approximately 250 mile, 345 kilovolt line between Fargo, North Dakota, and Alexandria, St. Cloud and Monticello, Minnesota.
- **Brookings Project:** An approximately 230 mile, 345 kilovolt line between Brookings, South Dakota, and the southeast Twin Cities, plus a related 30-mile, 345 kilovolt line between Marshall, Minnesota, and Granite Falls, Minnesota.
- **La Crosse Project:** An approximately 150 mile, 345 kilovolt line between the southeast Twin Cities, Rochester, Minnesota, and La Crosse, Wisconsin.
- **Bemidji Project:** An approximately 68 mile, 230 kilovolt line between Bemidji and Grand Rapids, Minnesota

In addition to a certificate of need, Minnesota law requires that each transmission projects of these types obtain a route permit. Xcel Energy and the other CapX2020 Utilities are actively pursuing route permits and significant progress has already been made.

The Commission has approved a route permit for the Monticello-St. Cloud Project, MPUC Docket No. ET2, E002/TL-09-246, and for most of the Brookings Project, MPUC Docket No. ET2, E002/TL-08-1474.<sup>3</sup>

In addition, the CapX2020 Utilities will need to obtain permits from North Dakota, South Dakota, and Wisconsin, depending upon the line. The following is a brief summary of the status of the regulatory approvals required by each of these neighboring states.

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<sup>3</sup> On the Brookings Project, the Commission determined that the segment of the line that crosses the Minnesota River required additional record development to determine how concerns expressed by the U.S. Fish and Wildlife Service should influence the choice of river crossing. That record development is still ongoing and should be completed in the next few months.

**North Dakota:** Xcel Energy and the other CapX2020 Utilities who are involved with the Fargo Project are jointly seeking permits in the State of North Dakota associated with the CapX2020 Group 1 Projects. These include:

1. **Advanced Determination of Prudence:** Under North Dakota law, utilities may seek an advance determination of prudence of transmission and other infrastructure development. A request for this approval for Xcel Energy's investments in the CapX2020 Group 1 Projects has been filed and a hearing was held in May 2010 before the North Dakota Public Service Commission ("ND PSC"). A decision is pending.
2. **Certificate of Public Convenience and Necessity:** A CPCN is required for authorization to construct the North Dakota portion of the Fargo Project. An application for a CPCN has been prepared and will be filed soon and Xcel Energy anticipates that it will be acted upon in 2011.
3. **Corridor Compatibility and Route Permits:** The ND PSC requires a permit finding of corridor compatibility for the selected portion of the Fargo Project within North Dakota as well as a route permit for the specific route within the approved corridor. Applications for these permits are being prepared and we anticipate they will be filed later in 2010. We anticipate that they will be acted upon in 2011.

**South Dakota:** South Dakota requires that a facility permit be obtained for the South Dakota segment of the Brookings Project. An application for this permit is being prepared and is expected to be filed late this year. We anticipate that it will be acted upon in 2011.

**Wisconsin:** The Public Service Commission of Wisconsin ("PSCW") requires a CPCN for the La Crosse Project. Xcel Energy and the CapX2020 Utilities involved in this project are preparing an application for that permit and anticipates filing this application in late 2010. We anticipate that this application will be acted upon in 2011 or 2012.

## The Biennial Transmission Report

Every two years, the Minnesota Transmission-Owner Utility group (“MTO”) is required to file a report listing the specific present and foreseeable future transmission inadequacies; identify alternatives to address system inadequacies; identify general economic, environmental, and social issues associated with the alternatives; and summarize the input that transmission owners and operators gather from the public and local governments to assist in developing and analyzing alternatives.

Known as the Biennial Transmission Projects Report, the 2009 report was filed on November 2, 2009 and can be found at the Minnesota Department of Commerce’s e-filing web site or at [www.minnelectrans.com](http://www.minnelectrans.com). The 2009 report lists over 75 inadequacies throughout the state. Of those 75 inadequacies, two transmission projects needed to address specific issues on the Xcel Energy system are large enough to need a Certificate of Need from the state of Minnesota. They are shown in Table 10.1 below.

**Table 10.1**  
**Transmission Inadequacies Requiring a Certificate of Need**

Name	Size	Expected In-Service or Filing Date
Grand Meadow Wind	161 kV	2011
Southwest Metro	115 kV	2012-2013

With regard to transmission needed to support the Minnesota RES, the OES found in its review of the 2009 Report that there is or will be sufficient transmission capacity to allow the Minnesota utilities to remain on course to meet the 2010 and 2012 milestones established by the Minnesota RES. The OES also found that meeting the RES milestones of 2016 and beyond will require additional transmission capability. To ensure adequate transmission capacity to meet those milestones, MTO listed a number of potential transmission projects at various

stages of the plan-permit-build-cost recovery process. These projects are shown in Table 10.2 below.

Table 10.2  
Transmission Required to Meet RES Beyond 2016

<b>Project</b>	<b>Est. Additional Capacity Enabled (MW)</b>	<b>Current Status</b>
Blue Lake Upgrade*	600	Under construction
Brookings – Twin Cities *	700	In permitting
Fargo – Twin Cities*	700	In permitting
DC Line Purchase	355	In permitting
RIGO*	500	In permitting
Corridor*	2,000	Under review
La Crosse – Madison*	1,600	Under study
Fargo – Split Rock*	1,000	Under study

\* Denotes project that Xcel Energy is involved in.

The CapX 2020 Group 1 projects will add significant amounts of transmission capacity in support of generation expansion and load growth. For example, the Brookings Project will increase transmission capacity from the Buffalo Ridge area by roughly 700 megawatts. The Fargo Project will increase transmission capacity from northwestern Minnesota and North Dakota by roughly 350 megawatts. In combination with the Bemidji Project, this number could increase to 550 megawatts.

## MISO Interconnection Queue and Transmission Cost Allocation Processes

As the Commission knows, matters pertaining to the operation and administration of the regional transmission system (including Xcel Energy’s transmission assets) are governed by the MISO Open Access Transmission and Ancillary Services Tariff (the “MISO OATT”). The MISO OATT governs matters including the rights and obligations of generators who seek to interconnect to the regional system as well as the allocation of certain costs associated with the development of transmission projects. Since our last Resource Plan filing, a number of important developments have occurred that impact on interconnecting generators as well as the allocation of costs amongst stakeholders. This section provides a summary of some of those developments.

### *MISO Generation Interconnection Process Reform*

MISO implemented a comprehensive generator interconnection process as part of Order 2003.<sup>4</sup> This generally set up a “first-filed, first-served” process that allocated rights based on the first project to request an interconnection in a given area. As MISO and stakeholders gained experience implementing this process, it was determined that changes to the generator interconnection procedures were desirable. In 2008 MISO implemented and FERC approved Generation Interconnection Process Reform (Queue Reform)<sup>5</sup>. One of the primary changes to the new queue process was that interconnection requests would no longer be addressed on a first-come, first-served basis. The Queue Reform process specifies a “first ready, first served” process and also provides the customer information early in the process to more efficiently use the transmission provider’s planning resources and higher quality interconnection studies. The “first ready, first served” interconnection process also included a non-refundable interconnection application fee as well as study deposits based on the size of the interconnection request. The

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<sup>4</sup> Standardization of Generator Interconnection Agreements and Procedures, Order No. 2003, FERC Stats. & Regs. ¶ 31,146, at P 915 (2003), order on reh’g, Order No. 2003-A, FERC Stats. & Regs. ¶ 31,160, order on reh’g, Order No. 2003-B, FERC Stats. & Regs. ¶ 31,171 (2004), order on reh’g, Order No. 2003-C, FERC Stats. & Regs. ¶ 31,190 (2005), aff’d sub nom. Nat’l Ass’n of Regulatory Util. Comm’rs v. FERC, 475 F.3d 1277 (D.C. Cir. 2007).

<sup>5</sup> Midwest Independent System Operator, Inc. Docket No. ER08-1169-000, 124 FERC 61,183(Aug. 25, 2008)

purpose of this is to prevent speculative requests from saturating the queue and prevent the “queue churn” that was occurring when customers withdrew results and caused a chain reaction of restudies. There have been some modifications to the reform process since it was originally approved by FERC. Xcel Energy supports MISO’s Queue Reform process. While the process is an improvement, there are still refinements being reviewed in order to further enhance the process.

#### *Cost Allocation Reform*

Another topic of debate has been on how the MISO OATT allocates the cost of upgrades necessitated by a new interconnection requests and other major infrastructure projects. The MISO requirements have been evolving in response to stakeholder concerns over the methodology and impacts of how costs are allocated. As the Commission knows, over the past year MISO and stakeholders have been working on an intensive effort to address the cost allocation issues and to develop a proposal for changes to the MISO OATT that address these issues.

This effort culminated on July 15, 2010, when MISO filed new tariff provisions revising some of the cost allocation mechanisms in the OATT. While these changes have yet to be acted upon by FERC, they represent an important change from past practice.

In general, the changes in the MISO OATT clarify cost responsibility in two significant ways.

#### **Cost Responsibility for Network Upgrades**

For system upgrades that are required by a specific interconnection request, the interconnection customer is responsible for 100 percent of the costs of network upgrades rated below 345 kV and for bearing 90 percent of the costs of network upgrades rated at 345 kV and above (with the remaining 10 percent being recovered on a system-wide basis). This means that the generator must factor the cost of required network upgrades into its generation proposal. This type of cost

allocation is similar to how costs have been allocated in the recent past and are designed to address the costs of specific system upgrades that have been necessitated by a specific interconnection request. The new MISO OATT provisions also include cost sharing provisions between the interconnection customer who triggers the need for a facility (the “First Mover”) and subsequent interconnection customers(s) who are determined to use capacity from a facility. Under MISO’s recently-filed changes, the First Mover will be required to fund the necessary Network Upgrades triggered by its project. When a subsequent generator makes a proposal, MISO will analyze its impact on the previous upgrades. If the subsequent generator is determined to benefit from a Network Upgrade that was funded by the First Mover, that benefit will be calculated and a one-time payment will be made by the subsequent generator.

#### *Multi-Value Projects*

The second element of change in the MISO OATT is a new mechanism for addressing particular regional infrastructure projects. The new methodology focuses on allocating costs for Multi-Value Projects (“MVP”). MVPs are projects identified through the MISO transmission planning process that are developed to meet public policy requirements, such as the integration of renewable resources to meet state renewable energy mandates, and/or provide other types of benefits to two or more MISO zones, such as (i) ability to meet future reliability standards; (ii) ability to reduce reserve margins; or (iii) reduction in Locational Marginal Prices for energy (through decreased congestion or access to lower cost generation resources). Under this new mechanism, Xcel Energy expects that large, regional, transmission upgrade projects that serve multiple purposes will be eligible for consideration as MVPs.

Once a project has been designated a MVP, the costs associated with it will be paid for by the MISO member utilities based upon their share of the load and exports within the MISO footprint via a system-average “postage stamp” (per-MWh) rate. Essentially the cost of MVPs is shared by all of the MISO transmission owners in proportion to their use of the system

### **SMARTransmission Study**

The Company is also participating in the Strategic Midwest Area Renewable Transmission (SMART) Study that was commissioned in August of 2009. The goal of the study is to prepare a comprehensive study of transmission needs in the upper Midwest to support renewable energy development and support transporting energy to customers in the study area. The group is not in competition with other studies but has been reviewing other studies and using the results as appropriate. The study focus is 20 years into the future and transcends the traditional regional boundaries. Phase one of the study has been completed and a report will be issued in early summer 2010. Phase two of the study, which performs economic analysis of the transmission alternatives, is expected to be completed by fall 2010.

### **Manitoba Hydro Transmission Service Request (TSR)**

Several load-serving entities in Minnesota and Wisconsin have signed term sheets to purchase additional hydroelectric power from Manitoba Hydro. The total amount of new requests was 1,100 MW. In response to these requests, the Midwest ISO has begun a study process to investigate appropriate transmission enhancements to transmit this power from the Winnipeg area to the utilities purchasing the power. Initial results have identified the need for a new 500 kV line to support this TSR. Study work for this effort is ongoing and it is anticipated that results (and potential costs) could be known by the end of 2010.

### **Regional Generator Outlet Study (RGOS)**

In an effort to align the transmission development efforts associated with renewable energy mandates in the upper Midwest, MISO has begun a study to develop a streamlined transmission plan to enable utilities to meet the various renewable energy mandates in the MISO footprint. The study was divided into two phases. The first phase focused on the upper Midwest, including Minnesota, North Dakota, South Dakota, Iowa, and Wisconsin, the area of most intense wind

development interest in the MISO footprint. Upon completion of the first phase, the remainder of the MISO footprint was brought into the effort.

The study began by identifying appropriate zones for new wind in each state being studied. The state commissions in the Upper Midwest Transmission Development Initiative (“UMTDI”) played a critical role in developing and gaining regulatory buy-in for the wind zone assumptions being used. After settling on wind zone assumptions and developing estimates of the amount of wind necessary to meet state mandates, MISO and stakeholders developed a number of potential transmission plans to deliver that energy to load and then tested and refined those solutions. When the remainder of the MISO footprint was brought into the study scope, the plans were further refined to eliminate lightly-loaded or redundant facilities. MISO anticipates publishing the findings of the RGOS effort in late summer 2010.

### **Conclusion**

Significant study is underway to establish a comprehensive planning framework for new transmission that can respond to generation planning efficiently in the years to come. The major drivers tending to influence the transmission requirements associated with new generation include distance from the major load centers (particularly the Twin Cities), size of the proposed addition, proximity to other generation, and whether the proposed generation site is near an existing major (345/500 kV) interconnection.

Over time, the electrical system has become a complex network of interconnected electrical paths. The current flowing on any element of the interconnected system changes constantly and depends on where the demand for electricity is, where the generation responding to that consumer demand is located, and the elements of the transmission system between generator and consumer available at the time.

Current studies indicate that utilities can meet the 2010 RES milestone with modest upgrades in lower-voltage transmission lines and with currently planned upgrades and additions, we can also meet the 2012 milestones. Meeting the RES milestones of 2016 and beyond will require transmission upgrades or additions that are not yet fully developed and will be influenced by the magnitude and location of wind development.