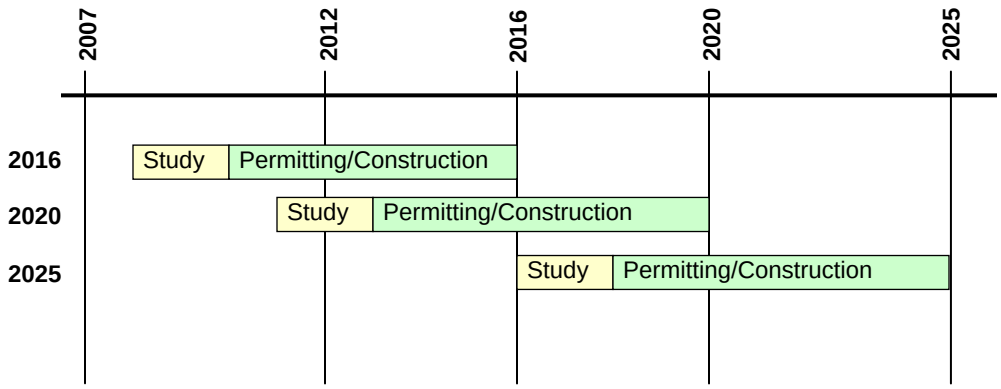
6.0 Five Year Action Plan

6.1 Introduction

In the Renewable Energy Act establishing the Renewable Energy Standards and directing the utilities to file this Report, the Legislature instructed the utilities to include a five-year action plan in the Report. As described in Section 2 (Gap Analysis), the utilities are on course to meet the 2010 milestone, and with modest upgrades in the smaller transmission lines, the utilities expect that the 2012 milestones will be achieved as well.

However, a lot more will be happening over the next five years besides just the construction of the transmission lines that have been under development for the past few years. Historically, major transmission projects take five to seven years to implement – from the time the transmission study is completed until the actual transmission line is energized. This doesn't include the time incurred in designing and conducting the study, which commonly takes two years to complete. Thus, the transmission that will need to be in place in 2020 to meet that milestone will need to be identified by 2013, and studies will have to be undertaken before 2013, and similarly, studies looking at transmission needs for the 2025 standard will have to be underway in 2016, so specific lines can be identified in 2018.

The chart below shows the timelines for conducting studies, identifying specific projects, and bringing those projects online.



As the diagram illustrates, at any given time the utilities are in various stages of development of projects. While various studies are going on, other projects are in the governmental review process, and others are under construction. And, of course, as is evident from other parts of this Report and from the 2007 Biennial Report, planning for compliance with RES milestones is only one of the assignments utilities have to ensure a reliable electrical system. There are other studies underway besides just RES studies. There are projects under review whose primary purpose is load-serving or some other important function, and there are new transmission lines under construction at this moment to ensure that customers will continue to be served with electricity at all times under various contingencies.

With that background and understanding in mind, the discussion below focuses first on those steps that will be undertaken in the near-term, beginning essentially immediately, and then on longer-term projects that build on these preliminary efforts. These efforts range from vision-type studies that serve as springboards for other future studies to very detailed studies to determine precise transmission projects to construct.

6.2 Near Term Studies

6.2.1 Vision 2025 Version I

Objective. The objective of this study is to develop a long-range transmission plan that focuses on delivering 25% (30% for Xcel Energy) of the energy to consumers within the State of Minnesota from renewable sources by the year 2025. The study will test multiple conceptual transmission plans to determine the benefits these facilities provide in meeting the renewable requirements. The study will consider alternative scenarios for obtaining the resources necessary, alternative transmission scenarios, and the timing of potential projects in meeting the various renewable milestones. The study is intended to be a high level study that can be used as input into future transmission studies involving specific transmission projects.

Scope. The transmission study will examine the projected transmission facilities necessary to serve 2025 load levels in and around the Minnesota area, the support of renewable generation projects, and other generation projects needed to maintain system reliability in the region. Similar to the CapX 2020 Vision study, this study will look at various generation scenarios that include a dispersed renewable generation scenario, renewable projects with high levels of concentration, and a scenario that assumes additional wind resources to address RES in the eastern portion of the MISO footprint. Within each of these scenarios, various biases will be created, such as Minnesota concentric and western. Within each of these broad scenarios, these biases will be altered to determine which transmission projects best address future generation expansion.

Timeframe. Scoping for this study will begin immediately, and the study should be completed by 12/31/08.

***Potential Outcome*.** This study will likely point out potential transmission projects that will needed to be studied in more detail, and will be the springboard for a RES 2016 Transmission Plan.

6.2.2 RES 2016

Objective. This study will refine the transmission alternatives identified in the Vision 2025 Version I study. The focus of the study will be to identify the transmission alternatives that need to be considered in order for the Minnesota Load Serving Entities to meet their respective renewable energy targets.

Scope. This transmission study will focus on identifying transmission needed to meet anticipated 2016 load levels in and around the Minnesota area, the support of the 2016 renewable

energy standards, and other generation projects needed to maintain system reliability. The study will attempt to refine generation scenarios based on information gathered from the MISO generation queue, opportunities identified in the Dispersed Renewable Generation (DRG) studies, the 230 kV System Upgrade study, and the G&T Optimization Study. The study effort would consider stability analysis to determine impacts on known stability stability-constrained interfaces and to ensure no new stability-constrained interfaces are created.

Timeframe. Scoping of this study will begin in March of 2008 with completion in December 2008.

Potential Outcome. From this study, specific projects will be studied as described below.

6.2.3 Specific RES 2016 Projects

Objective. Given the results of the RES 2016 study, this study would involve more detailed analysis of the load projects in the region, generation projects (both renewable and non-renewable) that require transmission development to occur in order that the 2016 renewable energy standard is meet.

Scope. The study will focus on the impacts that new transmission project(s) have on meeting the 2016 renewable energy standard, as well as addressing any load serving issues within the region. The study would involve steady-state, dynamic and voltage stability analysis. The study will also identify the underlying transmission upgrades associated with the transmission project(s).

6.2.4 230 kV System Upgrade (Minnesota Valley – Blue lake)

Objective. Past transmission studies continue to identify that the Minnesota Valley – Panther – Blue Lake 230 kV transmission line limits transfer capability from the western portion of Minnesota to the Twin Cities. This study will look to identify transmission alternatives that eliminate this constraint on the transmission network, thus allowing additional development of renewable generation to occur along the Buffalo Ridge area.

Scope. The study will focus on identifying the impacts associated with various transmission alternatives, including upgrades to existing transmission facilities. The study would involve steady-state, dynamic and voltage stability analysis. The studies would determine whether the transmission projects being recommended are the least cost alternatives that address meeting the 2016 renewable energy standard requirements. The study will also identify the underlying transmission upgrades associated with the transmission project(s).

Timeframe. Immediately begin scoping of this study with anticipated completion of this study on 11/1/08.

Potential Outcome. Results from this study can potentially be used to develop specific transmission projects that would be permitted. This type of study will have enough detail to meet the reliability objectives of approval authorities.

6.2.5 G&T Optimization

Objective. The study will look at the economic benefit of siting wind projects in quality wind regions and the associated transmission costs versus location where wind resources are not ideal. The study will attempt to identify wind development models (dispersed versus concentrated) implications on the development of transmission to serve remote load centers. The economics of the wind output will be contrasted with the cost of the wind development and its associated transmission costs.

Scope. The study will identify locations in the upper Midwest that have high and marginal wind profiles from which transmission studies will be conducted to determine the transmission needed to deliver the energy to load centers. As preliminary results become available, more detailed analysis may be warranted. This extended analysis could include steady-state powerflow modeling and ProMod analysis. The ultimate goal of the scenarios will be to determine which wind/transmission development project(s) should be considered in future expansion of renewable wind generation.

Timeframe. Scoping of this study will begin immediately, which will also include development of a timeframe for completion.

6.2.6 DRG Phase I and II

Objective. The focus of these studies is to optimize the interconnection & delivery of 600 MW of dispersed renewable generation in 2010 (Phase II to consider 2012) – projects will be 10 to 40 MW each and will be interconnected to the sub-transmission system. The study is to identify project sites that minimize impacts to the transmission system and if impacts are identified, develop specific solutions and associated costs. These studies are to be coordinated with recent and current regional power system study work including long-range transmission plans being developed for the RES.

Scope. The study will incorporate input from the public and the Department of Commerce's Technical Review Committee (TRC) to identify specific sites to be studied in each phase of the study. Based on preliminary results, the TRC can alter the location of the sites with additional analysis being done. Public meetings will be held to discuss interim results prior to the final report being submitted to the Public Utilities Commission. The Phase I study is to be completed by June 15, 2008 and the Phase II study is required to be completed by September 15, 2009.

6.2.7 Midwest ISO Transmission Expansion Plan – 2008

The MTEP-06 and MTEP-07 expansion plans are described briefly in Section 3.3 of the Biennial Report. However, the Midwest ISO is actually already on its way to developing the MTEP-08 Report, and in fact, is holding workshops to solicit input on the MTEP-09 Report.

As part of the development of MISO's 2008 Transmission Expansion Plan, MISO is investigating the necessary build out of transmission infrastructure given different generation futures. According to MISO, a future is a model with variable assumptions accounting for

realistic potential future events. The result of a future expansion is a generation portfolio. The overriding goal is to identify regional transmission infrastructure upgrades that should be pursued to efficiently move new generation to market given the possibility of various generation construction patterns.

The four patterns are:

- Reference – this pattern is essentially the status quo, modeling the power system as it exists today and assumes that current environmental legislation and renewable energy mandates remain in effect at their current levels.

- Environmental – this pattern represents what the infrastructure build-out could look like given the economic impacts of a $25 per ton carbon tax.

- Renewable Mandate – this pattern simulates what could happen is 20% of the energy consumption must come from a renewable energy source by 2020. Further, the assumption is that the renewable source will be wind.

- Limited Fuel Supply – this pattern simulates what the generation system could look like if there is a limitation on the supply of natural gas as a generation fuel source.

Preliminary results indicate that all the potential futures would require significant transmission infrastructure improvements in order to serve the increasing nationwide demand for energy, particularly wind energy. Due to the location of renewable resources, the renewable mandate scenario is forecasted to require the most aggressive transmission infrastructure build-out, as utilities further east are forced to purchase their wind energy from sources in the upper Midwest. This is due to the prevalence of the wind resource in the Midwest compared with other parts of the country.

This study will continue to be developed by the Midwest ISO with final publication anticipated in late 2008.

6.3 Future Refinements

6.3.1 Vision 2025 Version II

Objective. Similar to the Vision 2025 Version I study, Version II will retest the 2025 vision given changes in base assumptions as to how the transmission network has evolved since the Vision 2025 Version I study was completed at the end of 2008. Load forecast assumptions, new generation patterns, as well as possible federal and state regulatory policy changes will be considered in developing study assumptions.

Scope. The transmission study will determine the projected transmission facilities necessary to serve 2025 load levels in and around the Minnesota area, the support of renewable generation projects, and other generation projects needed to maintain system reliability in the region. Similar to the Vision 2025 Version I study, this study will look at various generation scenarios

that include a dispersed renewable generation scenario, renewable projects with high levels of concentration, and a scenario that assumes additional wind resources to address RES in the eastern portion of the MISO footprint.

6.3.2 RES 2020

Objective. The purpose of this study is to refine the transmission alternatives identified in the Vision 2025 Version I study for the 2020 period. The focus of the study will be on identifying the transmission alternatives that need to be considered in order for the Minnesota Load Serving Entities to meet their respective renewable energy targets.

Scope. The transmission study will focus on identifying transmission needed to meet anticipated 2020 load levels in and around the Minnesota area, the support of the 2020 renewable energy standards, and other generation projects needed to maintain system reliability. The study will look at more probable generation scenarios based on information gathered from the MISO generation queue, opportunities identified in other ongoing sub-regional and regional studies, and the G&T Optimization Study. The study effort would consider stability analysis to determine impacts on known stability-constrained interfaces and to ensure no new stability-constrained interfaces are created.

6.3.3 Specific RES 2020 Projects

Objective. Given the results of the RES 2020 and Vision 2025 Version II studies, this study would involve more detailed analysis of the generation projects in the region-generation projects (both renewable and non-renewable) that require transmission development to occur in order that the 2020 renewable energy standard is meet.

Scope. The study will focus on the impacts that new transmission project(s) have on meeting the 2020 renewable energy standard, as well as addressing any load serving issues within the region. The study would involve steady-state, dynamic and voltage stability analysis. The study would determine whether the transmission projects being recommended are the least cost alternatives that address 2020 transmission needs. The study will also identify the underlying transmission upgrades associated with the transmission project(s).

6.3.4 Vision 2030 Version I

Objective. Similar to the Vision 2025 Version I study, this study will reset the vision for the 2030 time period and consider changes in regulatory policies, technology changes, and existing transmission infrastructure at the time the study commences. Load forecast assumptions, new generation patterns, as well as possible federal and state regulatory policy changes, will be considered in developing study assumptions.

Scope. The transmission study will determine the projected transmission facilities necessary to serve 2030 load levels in and around the Minnesota area, the support of renewable generation projects, and other generation projects needed to maintain system reliability in the region. Similar to the Vision 2025 Version I study, this study will look at various generation scenarios

that include a dispersed renewable generation scenario, renewable projects with high levels of concentration, and a scenario that assumes additional wind resources to address RES in the eastern portion of the MISO footprint.

6.3.5 RES 2025

Objective. This study will refine the transmission alternatives identified in the Vision 2025 Version II study and incorporate study assumptions from the Vision 2030 Version I study. The focus of the study will be on identifying the transmission alternatives that need to be considered in order for the Minnesota Load Serving Entities to meet their respective renewable energy targets.

Scope. The transmission study will focus on identifying transmission needed to meet anticipated 2025 load levels in and around the Minnesota area, the support of the 2025 renewable energy standards, and other generation projects needed to maintain system reliability. The study will look at more probable generation scenarios based on information gathered from the MISO generation queue and opportunities identified in other ongoing sub-regional and regional studies. The study effort would consider stability analysis to determine impacts on known stability-constrained interfaces and to ensure no new stability-constrained interfaces are created.

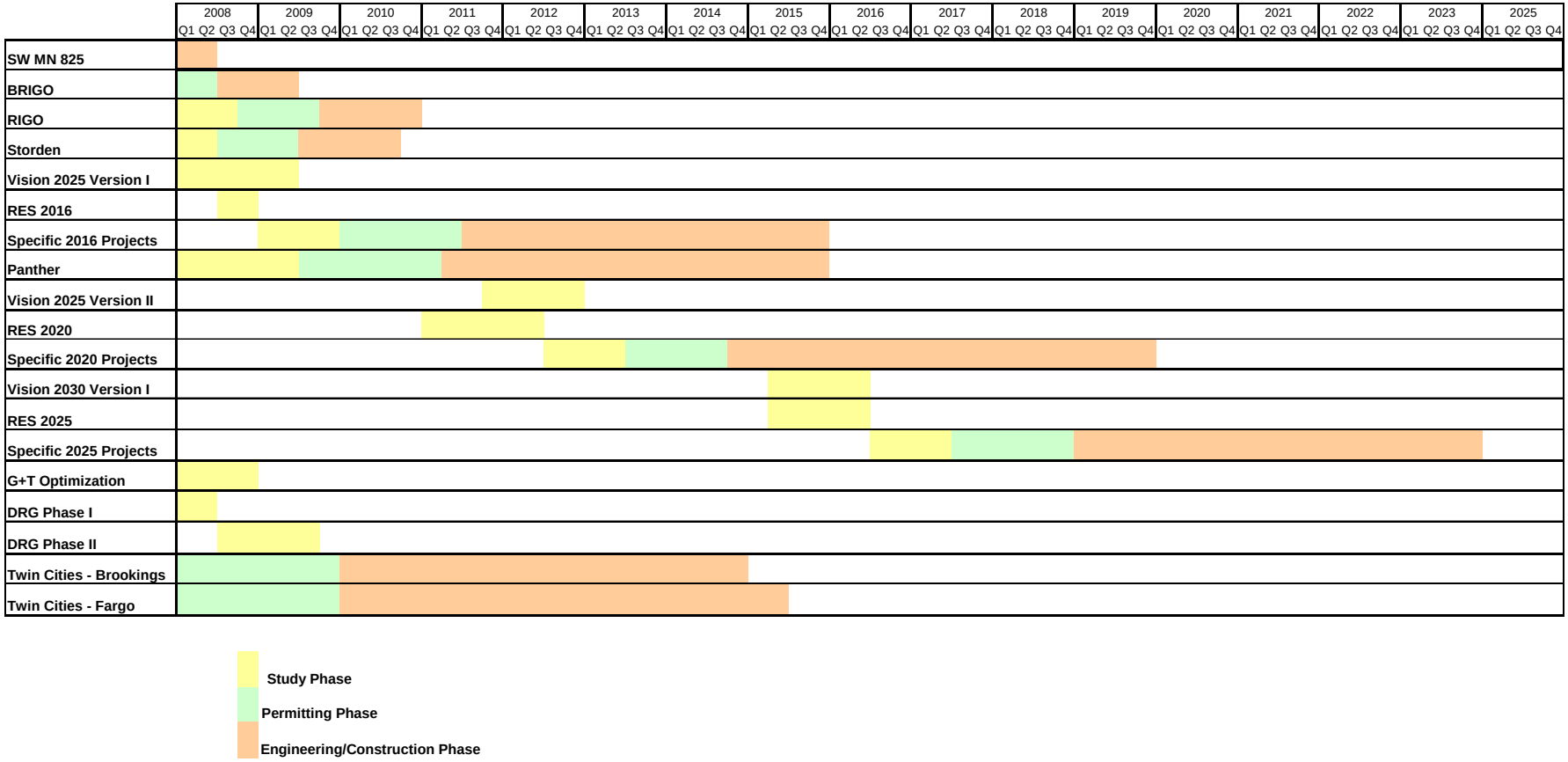
6.3.6 Specific RES 2025 Projects

Objective. Given the results of the RES 2025 and Vision 2030 Version I studies, this study would involve more detailed analysis of the generation projects in the region-generation projects (both renewable and non-renewable) that require transmission development to occur in order that the 2025 renewable energy standard is meet.

Scope. The study will focus on the impacts that new transmission project(s) have on meeting the 2025 renewable energy standard, as well as addressing any load serving issues within the region. The study would involve steady-state, dynamic and voltage stability analysis. The study would determine whether the transmission projects being recommended are the least cost alternative that addresses 2025 transmission needs. The study will also identify the underlying transmission upgrades associated with the transmission project(s).

6.4 Summary

The following schematic illustrates the timing of the various studies that are described above. The first five years of the schematic essentially reflects the utilities' Five Year Plan, and shows that during the upcoming five year period, certain studies will have been undertaken or under development and various projects are anticipated to be under construction.


2008 Q1 Q2 Q3 Q4
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2012 Q1 Q2 Q3 Q4
2013 Q1 Q2 Q3 Q4
2014 Q1 Q2 Q3 Q4
2015 Q1 Q2 Q3 Q4
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2018 Q1 Q2 Q3 Q4
2019 Q1 Q2 Q3 Q4
2020 Q1 Q2 Q3 Q4
2021 Q1 Q2 Q3 Q4
2022 Q1 Q2 Q3 Q4
2023 Q1 Q2 Q3 Q4
2025 Q1 Q2 Q3 Q4
SW MN 825
BRIGO
RIGO
Storden
Vision 2025 Version I
RES 2016
Specific 2016 Projects
Panther
Vision 2025 Version II
RES 2020
Specific 2020 Projects
Vision 2030 Version I
RES 2025
Specific 2025 Projects
G+T Optimization
DRG Phase I
DRG Phase II
Twin Cities - Brookings
Twin Cities - Fargo
Study Phase
Permitting Phase
Engineering/Construction Phase