

Exhibit ____ (GWE-7)

Final Report - 2006 Minnesota Wind Integration Study Volume I

Prepared for:

The Minnesota Public Utilities Commission

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In Collaboration with:

The Midwest Independent System Operator

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The study began in December 2005 and was completed in November 2006. Both the challenging study scope and the aggressive schedule have been very significant challenges.

The study has benefited from extensive expert guidance and review by a Technical Review Committee (TRC). Four TRC meetings, each a full day, and numerous conference calls were held throughout the course of the study to review and discuss the study methods and assumptions, wind scenarios, model development, results, and conclusions. With excellent input from the utilities, MISO, wind interests, and national experts, we have reached consensus on overall study methods and assumptions, on the wind scenarios to be studied, on the modeling approach, and on the key results and conclusions. Participants in the TRC included:

Steve Beuning, Xcel Energy
Ed DeMeo, Utility Wind Integration Group
John Dunlop, American Wind Energy Association
Dave Geschwind, Southern Minnesota Municipal Power Agency
Brian Glover, Mid-Continent Area Power Pool/ Midwest Reliability Organization
Jeff Haase, MN Department of Commerce
Daryl Hanson, Otter Tail Power
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Matt Schuerger (TRC Chair), Technical Advisor to the MN PUC
John Seidel, Mid-Continent Area Power Pool / Midwest Reliability Organization
Stan Selander, Great River Energy
Charlie Smith, Utility Wind Integration Group
JoAnn Thompson, Otter Tail Power
Jerry Tielke, Missouri River Energy Services
Lise Trudeau, Minnesota Department of Commerce
Chuck Tyson, Midwest Independent System Operator

Ray Wahle, Missouri River Energy Services
Ken Wolf, Minnesota Public Utilities Commission
Zheng Zhou, Midwest Independent System Operator

Thank you to all of the study participants for an extraordinary effort and a ground breaking study.

Ken Wolf

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EXECUTIVE SUMMARY

Wind generation cannot be controlled or precisely predicted. While these attributes are not unique to wind generation, variability of the fuel supply and its associated uncertainty over short time frames are more pronounced than with conventional generation technologies. Energy from wind generating facilities must be taken “as delivered”, which necessitates the use of other controllable resources to keep the demand and supply of electric energy in balance.

Integrating wind energy involves the use of supply side resources to serve load not served by wind generation and to maintain the security of the bulk power supply system. Conventional resources must then be used to follow the net of wind energy delivery and electric demand and to provide essential services such as regulation and contingency reserves that ensure power system reliability. To the extent that wind generation increases the required quantity of these generating services, additional costs are incurred.

The high reliability of the electric power system is premised on having adequate supply resources to meet demand at any moment. In longer term planning, system reliability is often gauged in terms of the probability that the planned generation capacity will be sufficient to meet the projected system demand. It is recognized that conventional electric generating plants and units are not completely reliable – there is some probability that in a given future hour capacity from the unit would be unavailable or limited in capability due to a forced outage – i.e. mechanical failure. Even if the installed capacity in the control area exceeds the peak projected load, there is some non-zero probability that the available capacity might be insufficient to meet load in a given hour

The capacity value of wind plants for long term planning analyses is currently a topic of significant discussion in the wind and electric power industries. Characterizing the wind generation to appropriately reflect the historical statistical nature of the plant output on hourly, daily, and seasonal bases is one of the major challenges. Several techniques that capture this variability in a format appropriate for formal reliability modeling have been proposed and tested. The lack of adequate historical data for the wind plants under consideration is an obstacle for these methods.

By any of these methods, it can be shown that wind generation does make a calculable contribution to system reliability in spite of the fact that it cannot be directly dispatched like most conventional generating resources. The magnitude of that contribution and the appropriate method for its determination are the important questions.

The work reported here addresses two major questions:

1. To what extent would wind generation contribute to the electric supply capacity needs for Minnesota electric utility companies?
2. What are the costs associated with scheduling and operating conventional generating resources to accommodate the variability and uncertainty of wind generation?