

PUBLIC VERSION

Application for Certificate of Need
Prairie Wind Energy Project

Otter Tail County
Minnesota

PRAIRIE WIND ENERGY, LLC

MPUC Docket No: IP-6844/CN-10-429

November 29, 2010



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PLEASE RESPOND TO DULUTH OFFICE

November 29, 2010

Dr. Burl Haar
Executive Secretary
Minnesota Public Utilities Commission
121 Seventh Place East, Suite 350
St. Paul, MN 55101

Re: In the Matter of the Application of Prairie Wind Energy, LLC for a Certificate of Need for the 100 MW Prairie Wind Energy Project in Otter Tail County PUC Docket No. IP-6844/CN-10-429

Dear Dr. Haar:

Attached is a Certificate of Need (CON) application for the Prairie Wind Project in Otter Tail County, Minnesota. This application is being submitted via the Commission's e-filing system by Fryberger, Buchanan, Smith and Frederick, P.A., on behalf of Prairie Wind Energy, LLC ("PWE"), a Minnesota limited liability company owned by eight individual Minnesota residents. PWE is organized as a Community-Based Energy Development project under Minn. Stat. § 216B.1612.

PWE filed a request on May 7, 2010, for exemptions from certain data requirements in Chapter 7849 of the Minnesota Rules and a variance of the 45-day waiting period between requesting exemptions and filing this application. This application does not include data for those parts of Chapter 7849 that were included in the exemption request.

Prairie Wind Energy, LLC seeks a CON authorizing construction of up to a 100 Megawatt (MW) Large Wind Energy Conversion System ("LWECS"). Associated facilities will include gravel access roads, an electrical collection system, permanent meteorological towers, SODAR or LIDAR unit, construction of a substation, and an operations and maintenance building.

PWE requests that processing this application be combined, to the extent practicable, with the associated Large Wind Energy Conversion System Site Permit Application for the Project, which PWE expects to file within two months of the filing of this Certificate of Need Application.

Confidential information is included in the Application. A public version of the Application has been filed along with the trade secret version.

Sincerely,

/s/ John R. Gasele

John R. Gasele

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**STATE OF MINNESOTA
BEFORE THE
PUBLIC UTILITIES COMMISSION**

Dr. David C. Boyd
Phyllis Reha
Thomas W. Pugh
J. Dennis O'Brien
Betsy Wergin

Chair
Vice Chair
Commissioner
Commissioner
Commissioner

**In the Matter of the Application of
Prairie Wind Energy, LLC for a
Certificate of Need for the
100 MW Prairie Wind Energy
Project in Otter Tail County**

MPUC Docket No. IP-6844/CN-10-429

SUMMARY OF FILING

On November 29, 2010, Prairie Wind Energy, LLC (“PWE”), filed this Application for a Certificate of Need (CON) for a Large Energy Facility with the Minnesota Public Utilities Commission (“MPUC”) pursuant to Minnesota Statutes, Section 216B.243, subd. 2. PWE requests that the MPUC issue a CON for a Large Wind Energy Conversion System (“LWECS”) of up to 100 MW of nameplate capacity to be located in Otter Tail County, Minnesota (the “Project”). The Project will provide energy to wholesale customers, including Minnesota utilities and cooperatives that need additional renewable energy generation. The Project is expected to achieve commercial operation by December 31, 2012.

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Application for Certificate of Need

Prairie Wind Energy Project

Otter Tail County, Minnesota

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PUBLIC VERSION – TRADE SECRET INFORMATION HAS BEEN REDACTED**Table 1: LEGF Certificate of Need Rule Cross-References**

Rule	Information Requested	Exemption Requested?	Application Section
7849.0120	Criteria		
A	Probable result of denial would be an adverse effect upon the future adequacy, reliability, or efficiency of energy supply to applicant, customers, people of Minnesota and neighboring states	No	IV.A.1.
B	A more reasonable and prudent alternative has not been demonstrated	No	IV.A.2
C	The Project will provide benefits to society	No	VI.A.3
7849.0240	Need Summary and Additional Considerations	--	II
Subpart 1	Summary of major factors justifying the need for the facility	No	II.A
Subpart 2 A	Socially beneficial uses of output of the facility, including its uses to protect or enhance the environment	No	II.B.1.a.
Subpart 2 B	Promotional Activities that may have given rise to demand for the facility	Yes	II.B.1.b.
Subpart 2 C.9	Effects of facility in inducing future development	Yes	II.B.1.c.
7849.0250	Description of proposed LEGF and alternatives	--	III
A 1	Nominal generating capacity and effect of economies of scale	No	III.A.1.
A 2	Anticipated operating cycle and annual capacity factor	No	III.A.2.
A 3	Type of fuel, reason for selection, projection of availability over life of the facility, and alternative fuels	No	III.A.3.
A 4	Anticipated heat rate of the facility	No	III.A.4.
A 5	Anticipated area where facility will be located	No	III.A.5.
B 1	Discussion of Alternatives – Purchased power	Yes	III.B.1.
B 2	Discussion of Alternatives – Increased efficiency of existing facilities, including transmission lines	Yes	III.B.2.
B 3	Discussion of Alternatives – New transmission lines	Yes	III.B.3.
C 1	Capacity cost in current dollars per kilowatt	Yes	III.C.1.a.
C 2	Service life	Yes	III.C.1.b.
C 3	Estimated average annual availability	Yes	III.C.1.c.
C 4	Fuel costs in current dollars per kilowatt hour	Yes	III.C.1.d.
C 5	Variable operating and maintenance costs in current dollars per kilowatt hour	Yes	III.C.1.e.
C 6	Total cost in current dollars of a kilowatt hour provided to it	Yes	III.C.1.f.
C 7	Effect on rates system wide and in Minnesota	Yes	III.C.1.g.
C 8	Efficiency expressed for a generating facility as the estimated heat rate	Yes	III.C.1.h.
C 1-8	Solar Generation Alternative	Yes	III.C.2.
C 1-8	Hydroelectric Generation Alternative	Yes	III.C.3.
C 1-8	Biomass Generation Alternative	Yes	III.C.4.
C 1-8	Emerging Technologies Alternatives	Yes	III.C.5.
D	Map of Applicant's System	Yes	III.D.
7849.0270	Peak demand and annual consumption forecast	Yes	IV.A.
7849.0280	System capacity	Yes	IV.B.1.
7849.0290	Conservation programs	Yes	IV.B.2.
7849.0300	Consequences of delay	Yes	IV.B.3.
7849.0320	Generating facilities	--	V.A.

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Rule	Information Requested	Exemption Requested?	Application Section
A	The estimated range of land requirements, including water storage, cooling systems and solid waste storage	No	V.A.
B	Estimated vehicular, rail and barge traffic generated by construction and operation of the LEGF	No	V.B.
E	Water use for alternate cooling system	No	V.C.
F	Potential sources and types of discharges to water	No	V.D.
G	Radioactive releases	No	V.E.
H	Potential types and quantities of solid wastes in tons/years	No	V.F.
I	Potential sources and types of audible noise generated	No	V.G.
J	Estimated work force required for construction and operation	No	V.H.
K	Minimum number and size of transmission facilities required to provide a reliable outlet	No	V.I.
7849.0330	Transmission facilities	Yes	V.I.A.
7849.0340	Alternative of no facility	Yes	III.B.4, VI.B

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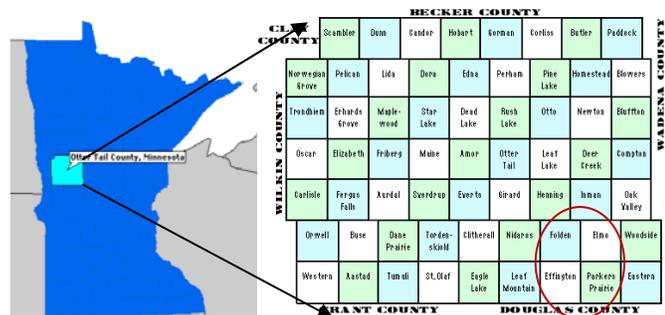
I. Introduction and Executive Summary

Prairie Wind Energy, LLC (PWE), submits this application for a Certificate of Need (“CON”) from the Minnesota Public Utilities Commission (“MPUC”) for the 100 Megawatt (“MW”) Prairie Wind Energy Project (the “Project”) under Minn. Stat. §216B.243 and chapter 7849 of the Minnesota Rules. PWE respectfully requests that the MPUC issue a CON for the Project.

A. Introduction

PWE intends to construct and operate a 100 MW Large Wind Energy Conversion System (“LWECS”) in Southeastern Otter Tail County, Minnesota. The Project is located approximately one mile from the community of Parkers Prairie, Minnesota, west of SH 29 and north of SH 235, with most of the Project site in the townships of Parkers Prairie and Elmo. Other townships within the Project site include Effington and Folden, also in Otter Tail County, Minnesota.

Figure 1: Project Location



The Project is a Large Energy Facility as defined in Minn. Stat. § 216B.2421, Subd. 2, and cannot be constructed without a CON and a site permit from the MPUC.

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PWE, a Minnesota limited liability company formed in 2007, is responsible for the oversight and management of the Project, along with construction, operations and maintenance. PWE is owned by eight individual Minnesota residents, many of whom live within the Project area. The Project will qualify as a Community Based Energy Development (“C-BED”) project under Minn. Stat. § 216B.1612. PWE does not own any existing LWECS or other wind generation facility, and is only involved in this Project. PWE has more than 8,000 acres under lease for turbine sites for the Project, and is currently working to acquire wind rights to approximately 1,500 acres.

PWE has been working in conjunction with PlainStates Energy (“PSE”). PSE has been involved with the development, construction, operation and maintenance of large-scale wind projects for 25 years. PSE serves only to facilitate development of the Project under direction of PWE, and has no ownership interest in PWE or the Project. PSE’s owners, however, have interests in other existing or planned C-BED projects.

PWE intends to operate as an independent power producer, offering the electricity generated by the Project on the wholesale market to utilities, power cooperatives or other entities that need energy generated from a renewable resource. The Project is designed and intended to aid utilities in meeting the Renewable Energy Standard (“RES”) set out in Minn. Stat. § 216B.1691 or similar laws in other states.

PWE has filed all necessary applications, met all milestone requirements and paid all necessary fees to the Midwest Independent System Operator (“MISO”). The Project is included in Definitive Planning Phase 1 of the MISO interconnection process with a designated Project Number of G843. The System Impact Study (SIS) was completed in March 2009. There were

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no thermal problems cited for this Project, and a facility study indicated no short-circuit or delivery issues. The Project is currently in the Facility Study phase of the MISO interconnection process, waiting for completion of the Group Five Restudy initiated by MISO in 2010. The Project's interconnection and transmission costs are relatively low. PWE has completed facility studies for the required Great River Energy substation and Otter Tail Power communications system.

PWE has not yet reached an agreement with an equity partner that will take advantage of the production or other tax incentives created by the Project, but is currently in negotiations with potential partners. A power purchase agreement ("PPA") has not been signed for the Project. It is anticipated that future financial arrangements will be structured to retain C-BED status. As proposed, the Project is expected to achieve commercial operation by December 31, 2012.

The total cost to achieve commercial operation is approximately \$**Trade Secret Information Has Been Redacted**. Ongoing operation and maintenance costs are estimated to be approximately \$**Trade Secret Information Has Been Redacted** in the first year, escalating at **Trade Secret Information Has Been Redacted** per year thereafter.

The Project enjoys substantial community support. The Otter Tail County Board of Commissioners passed a Resolution of Support for the Project on June 23, 2009. PWE has held meetings with area Township boards, Otter Tail County Commissioners, local residents, other farmers and aerial sprayers in the area. These meetings have enabled PWE to address various concerns raised by these stakeholders during the planning process prior to filing this Application and a companion LWECS site permit application. The Project organizers and owners, many of

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whom live and work in the community, have adopted an up-front approach to sharing information with neighbors and other concerned parties.

B. Project Contacts

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C. Filing Fees and Payment Schedule (Minn. R. 7849.0210)

The total fee for this application and the payment schedule are as follows:

Table 2: Fee Calculation	
Fee Calculation	Amount
Fee Calculation Equation	\$10,000 + \$50/MW
Due with CON Application	\$3,750
Due 45 days after Application submittal date	\$3,750
Due 90 days after Application submittal date	\$3,750
Due 135 days after Application submittal date	\$3,750
Total Calculated Fee	\$15,000

This calculation is based on a Project capacity of 100 MW under the formula and schedule provided in subparts one and two of Minn. R. 7849.0210. A check for \$3,750 has been hand-delivered to the MPUC.

D. Exemption and Variance Requests

The Minnesota rules provide for one application process for LWECS, such as the Project, high-voltage transmission lines and other, non-renewable power-generation facilities. Many of the data requirements in Chapter 7849 of the Minnesota Rules simply do not apply to the Project because it does not involve a system as defined by the Minnesota Rules and does not utilize a traditional fuel source. PWE submitted its Request for Exemptions from Certain Data Filing

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Requirements¹ and Variance of the Time Period for Filing an Exemption Request on May 7, 2010 (“Exemption Request”).

PWE asked that the PUC: (1) grant exemptions from certain CON data requirements that are inapplicable to the evaluation of need for a renewable energy facility designed to satisfy the RES requirements set forth in Minn. Stat. 216B.1691; and (2) grant it a variance from the requirement that its request for exemptions be filed 45 days prior to filing the application for a CON, as set forth in Minn. R. 7849.0200, subp. 6. PWE has, nevertheless, endeavored to locate and provide information for criteria from which it has requested an exemption that may aid the MPUC in evaluating this application.

The MPUC granted all but one of PWE’s exemption requests on June 18, 2010 in an order incorporating comments of the Minnesota Office of Energy Security (the Exemption Order’).²

II. Need for the Project

A. Need Summary: Minn. R. 7849.0240, Subp. 1

The Project is needed to provide utilities in Minnesota and the surrounding region with additional power generated from renewable resources. The demand for renewable energy generation is expected to grow significantly in the future, and the Project is uniquely situated to deliver economical power to those utilities due to its competitive costs.

¹ As allowed by Minn. R. Minn. R. 7849.0200, subp. 6.

² All references to pages in the Exemption Order are to pages in the incorporated comments from the Office of Energy Security.

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Energy from renewable sources, such as the Project, will make up a significant part of the nation's electricity supply in the future. A recent estimate by the Energy Information Administration ("EIA"), the Annual Energy Outlook ("AEO") 2010 Early Release Overview,³ predicts that residential energy consumption will grow from 11.3 quadrillion BTU's in 2008 to 11.9 quadrillion BTU's in 2030.⁴ Increased demand will be tempered by new standards for heating, cooling and lighting equipment efficiency.⁵ Consumption of fossil fuels, however, is expected to decline by six percent from 2008 to 2035 despite the increase in electric power consumption.⁶ Renewable electric power is expected to supply 41% of the growth in power generation from 2008 to 2035.⁷ That figure does not include hydroelectric power.⁸

Minnesota will play a major role in providing the needed renewable energy. Minnesota ranks sixth in the U.S. in development of wind-powered electrical generation. According to the American Wind Energy Association (AWEA), as of December 31, 2009, Minnesota had 1,796 MW of installed wind capacity.⁹ Minnesota ranks ninth in the nation for potential wind generation capacity.¹⁰ The National Renewable Energy Laboratory and AWS Truewind, LLC recently estimated that Minnesota's total potential capacity for installed wind generation exceeds 489,000 MW.¹¹ Minnesota has tapped less than 1% of its total available wind resources.

³ Available online at <http://www.eia.doe.gov/oiaf/aeo/index.html> (last visited April 20, 2010).

⁴ *Id.* at p. 4.

⁵ *Id.*

⁶ *Id.* at 6.

⁷ *Id.*

⁸ *Id.*

⁹ Minnesota fell from fourth place at the end of 2008. AWEA's most recent data shows Minnesota only installed an additional 54 MW of generating capacity in 2009. AWEA U.S. Wind Energy Projects as of December 31, 2009, available online at www.awea.org/projects (last visited April 14, 2010).

¹⁰ *Id.*

¹¹ Estimates of Windy Land Area and Wind Energy Potential by State for Areas >= 30% Capacity Factor at 80m, February 4, 2010. Available online at

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Minnesota, surrounding states and the nation have vast needs for additional wind generation facilities like the Project. Minnesota’s “20x’25” Renewable Energy Objective (“REO”), updated in 2007, requires all Minnesota electric utilities to provide one quarter of their total retail electric sales¹² from renewable resources, such as wind, by 2025.¹³ A number of states in the upper Midwest have also adopted renewable electricity standards laws.

- North Dakota and South Dakota each established renewable energy objectives of 10 percent by 2015.¹⁴
- Wisconsin’s renewable energy standard requires 10 percent by 2015.¹⁵
- Iowa’s system is based on capacity, which requires that 105 MW of renewable energy capacity be developed by the state’s two public utilities. Iowa also has a voluntary renewable energy target of 1,000 MW.¹⁶
- Illinois renewable portfolio standard is 25 percent by 2025.¹⁷

A national renewable energy standard is also a future possibility. A bill creating a national renewable portfolio standard equal to Minnesota’s has been introduced in the United States Senate.¹⁸ Another bill that would increase demand for renewable generation by calling for a renewable electricity trading program has been introduced in the United States House of

http://www.awstruewind.com/files/AWST_NREL_wind_potential_80m_30percent_Feb10.pdf (last visited April 16, 2010).

¹² A utility’s total retail electric sales are “the kilowatt-hours of electricity sold in a year by an electric utility to retail customers of the electric utility or to a distribution utility for distribution to the retail customers of the distribution utility.” Minn. Stat. § 216B.1691, subd. 1(c).

¹³ Minn. Stat. § 1691. Excel Energy must generate or purchase 30% of its retail power sales from renewable resources by 2025.

¹⁴ North Dakota Century Code 49-02-24 et. seq. and South Dakota Codified Law §49-34A- 101 et seq.

¹⁵ Wis. Stat. §196.378.

¹⁶ Iowa Code §476.41 et seq.

¹⁷ Illinois Public Act 095-1027.

¹⁸ American Renewable Energy Act of 2009, S. 826, introduced to the 111th Congress by Senator Amy Klobuchar.

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Representatives.¹⁹ Wind power is expected to make a significant contribution to reaching such goals.

Enacting a federal requirement for 20% of all generated electricity to be produced from renewable wind resources would result in massive growth in wind energy production. The U.S. Department of Energy recently estimated that U.S. wind generation capacity would need to exceed 300,000 MW.²⁰ The United States currently has only 35,062 MW of installed capacity.²¹

PWE will offer the output of the Project on the wholesale market to a utility that is subject to one of the renewable energy standards mentioned above, thereby helping to meet state, regional or national goals for renewable energy production.

The Project is unique among planned wind-generation facilities in Minnesota in that it can provide power at an extremely competitive rate through its ability to leverage economies of scale and an expected lack of expensive upgrades to the transmission system in order to interconnect.

The Project will take advantage of economies of scale by utilizing 40 turbines to create a nameplate capacity of 100 MW. The size of the Project allows its per kilowatt hour cost to be very competitive. PWE also intends to work with two neighboring facilities, both of which are still in the planning stages, to utilize a single operations and maintenance facility. The Project is also located next to an existing 115kV Great River Energy (“GRE”) transmission line. Based on

¹⁹ American Renewable Energy Act, H.R. 890, introduced to the 111th Congress by Rep. Edward Markey.

²⁰ U.S. Department of Energy. “20% Wind Energy by 2030: Increasing Wind Energy’s Contribution to U.S. Energy Supply.” July 2008 at p. 2.

²¹ AWEA U.S. Wind Energy Projects as of December 31, 2009, available online at www.awea.org/projects (last visited April 14, 2010).

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interconnection studies conducted to date, PWE does not expect to bear significant network upgrade costs to interconnect to the transmission system.

Greater detail about the need for the Project is provided below in Part IV of this Application.

B. Additional Considerations**1. Project Relationship to Socioeconomic Considerations****a. Socially Beneficial Uses of Energy Produced by the Project, Including Protecting Environmental Quality: Minn. R. 7849.0240, Subp. 2, A.**

The electricity produced by the Project will benefit society, as discussed throughout this application. The primary societal advantage of the Project is its extremely low environmental impact compared to traditional generating technologies. The project will help meet state, regional and potential national goals for renewable energy production while simultaneously increasing the security and reliability of the domestic energy supply.

The local area around the Project will also see tremendous economic benefits. It is well-established that wind installations create positive direct impacts on local economies.²² The impact of constructing a wind generation facility is greater than the impact of a fossil-fuel based power plant.²³ The benefits range from lease payments to landowners, construction and operation-related expenditures, jobs and increased tax-revenue. The local economy will not see adverse impacts because the vast majority of the project area will remain in productive agricultural use.

²² National Renewable Energy Laboratory, *Analysis: Economic Impacts of Wind Applications in Rural Communities, June 18, 2004 to January 31, 2005*, M. Pedden, Eugene, Oregon, January 2006 at 7. Available online at <http://www.nrel.gov/wind/pdfs/39099.pdf> (last visited April 27, 2010).

²³ *Id.*

PUBLIC VERSION – TRADE SECRET INFORMATION HAS BEEN REDACTED**b. PWE’s Promotional Activities Will Not Increase Consumer Demand for Electricity: Minn. R. 7849.0240, Subp. 2, B.**

PWE was granted an exemption from Minn. R. 7849.0240, subp. 2(B). That rule requires the applicant for a certificate of need for a large electric generating facility to discuss the relationship of the facility to any promotional activities that may have increased demand for the facility. As a wholesale power producer, PWE will not operate on the commercial market and any promotional activities it may engage in will not be directed toward increasing demand. Instead, such efforts will be directed toward promoting the Project to utilities that need to purchase renewable energy in order to meet Minnesota’s RES or the renewable energy goals of surrounding states. Demand for renewable energy was created by the Minnesota legislature through enactment of the RES.

c. Effects of the Facility in Inducing Future Development: Minn. R. 7849.0240, Subp. 2, C.

PWE does not anticipate a large direct impact on future development in Otter Tail County. The most probable direct impact is the creation of 10 or more full-time jobs in conjunction with two other CBED projects proposed for the region. The majority of these jobs will be located at an operations and maintenance facility constructed as part of the Project.

Indirect impacts will include production tax revenues which will be distributed to local governmental units. Landowners will also receive rent payments, which have been demonstrated to provide a stable income for the life of the lease, thereby providing landowners with a hedge

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from income fluctuations inherent in crop and livestock production.²⁴ The majority of the project area will remain in productive agricultural use.

Money spent on local contractors, which will be used by PWE whenever possible, will remain within the community. Whenever possible and economically feasible, PWE will purchase materials and construction or operations services from the local community.

Finally, the Project will promote affordable, renewable electricity production for the region.

III. Description of Project and Alternatives

A. The Project: Minn. R. 7849.0250, A.

The Project consists of wind turbines and associated structures, which include access roads, electrical connection lines, transformers, meteorological towers, communication lines, an operations and maintenance building and a substation to connect the Project to an existing GRE 115kV transmission line located adjacent to the Project site.

PWE currently anticipates that the Project will consist of 43 2.3 MW turbines yielding a total nameplate capacity of 98.9 MW. PWE, however, may choose to use 40 2.5 MW turbines for a total nameplate capacity of 100 MW. PWE therefore submits this application with a request for a total of 100 MW of generation capacity. The final number and size of the turbines will be dictated by the terms of the PPA between PWE and an offtaker, current market conditions, turbine availability and the terms of the final site permit for the Project. The hub

²⁴ U.S. Government Accountability Office, *Report to the Ranking Democratic Member, Committee on Agriculture, Nutrition, and Forestry, U.S. Senate: Renewable Energy: Wind Power's Contribution to Electric Power Generation and Impact on Farms and Rural Communities*, September, 2004, GAO-04-756 at pp. 6, 35-36. Available online at <http://www.gao.gov/new.items/d04756.pdf> (last visited April 27, 2010).

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height of the turbines is expected to be 80 to 120 meters, and rotor diameters may be up to 115 meters. PWE requests discretion to vary the hub height, up to 120 meters, to allow the most efficient power production. The final site layout, regardless of the type, number and model of turbine, will comply with any site permit issued to PWE.

The Project will require additional facilities beyond the turbines. Those facilities include, but are not limited to:

- gravel access roads;
- underground conductors installed between turbines;
- 34.5 kV underground or, if necessary, overhead feeders to collect power from underground conductors installed between turbine strings;
- installation of a Supervisory, Control And Data Acquisition (“SCADA”) system;
- construction of a substation adjacent to an existing Great River Energy 115kV transmission line located in Section 10 of Parkers Prairie Township, Otter Tail County, Minnesota.
- construction of an Operation and Maintenance facility to be shared with two other wind projects.²⁵
- one or two additional meteorological towers (two are currently located in the project area;²⁶

The turbines will be mounted on a steel tower manufactured according to ANSI and IEC standards. Access to the tower, which will include an elevator and a ladder with a man-lift, will be through a locked door in the base of the tower. The turbines will include a Condition

²⁵ This facility will also be used for the previously-permitted Glacial Ridge 20MW facility in Southeast Pope County and the Bear Creek 47.5 MW facility located in Southwest Todd and Eastern Otter Tail Counties.

²⁶ PWE lost one of its two Meteorological Towers in a tornado that struck the project area in July, 2010. The lost tower was replaced in September 2010.

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Monitoring and Predictive Maintenance system to help identify technical problems and reduce the down-time for individual turbines.

Power will be collected through either underground or overhead power collection system, which will aggregate power at a substation to be built as part of the Project. The substation will connect to a GRE-owned 115kV transmission line.

A Supervisory Control and Data Acquisition (SCADA) system will be installed to monitor turbine availability and conditions. This system will alert personnel of faults and allow remote operation of turbines. It will also record turbine performance and assist with utility-shutdown needs.

PWE intends to construct an operations and maintenance facility within the Project Site. PWE intends to work with neighboring wind facilities to make this operations and maintenance facility available to multiple projects, thereby decreasing costs for all projects involved.

1. Nominal Generating Capability and Effect of Economies of Scale: Minn. R. 7849.0250, A. (1).

The Project will have a nameplate capacity of 100 MW. The Project is designed to take advantage of economies of scale because the permitting, operation and maintenance costs will be spread across 40 to 43 different turbines. AWEA notes that larger projects have lower operation and maintenance costs per kWh because operating a large project provides for greater management efficiency, which results in a lower delivered cost per kWh.²⁷

²⁷ AWEA, *The Economics of Wind Energy*, February 2005, p. 2, available online at <http://www.awea.org/pubs/factsheets/EconomicsofWind-Feb2005.pdf> (last visited April 28, 2010).

PUBLIC VERSION – TRADE SECRET INFORMATION HAS BEEN REDACTED**2. Anticipated Operating Cycle and Annual Capacity Factor: Minn. R. 7849.0250, A. (2).**

PWE expects that the Project will have a P50 (per turbine) net capacity factor of 40.0 percent. At that capacity factor, the net annual output per turbine will be 8,060,000 kWh (8,060 MWh) resulting in total net annual output of 346,580,000 kWh 346,580 MWh) for the Project.

3. Fuel: Minn. R. 7849.0250, A. (3).

The Project will be fueled by wind resources.²⁸

4. Anticipated Heat Rate: Minn. R. 7849.0250, A. (4).

Heat rates do not apply to the Project because it is a wind generation facility.

5. Facility Location: Minn. R. 7849.0250 A. (5).

The Project is in southeastern Otter Tail County, Minnesota, approximately one mile from the community of Parkers Prairie, Minnesota. Most of the Project is located west of SH 29 and north of SH 235 in the townships of Parkers Prairie and Elmo. Other townships within the Project footprint include Effington and Folden. PWE currently has approximately 8,000 acres under lease for the Project, and the total project area depicted on the map included as Figure 2 is 23,921 acres. A minimal amount of land, approximately 135 acres, will be disturbed during construction and operation.

The Project is located in a rural area with a primarily farm-based economy. Some pressure exists on farmland availability due to losses to industrial or urban use. The farmland in the Project area, however, requires irrigation through center-pivot systems. This results in less-

²⁸ Minn. R. 7849.0250(A)(3) requires an application to describe fuel availability and alternative fuel sources. This data requirement does not apply to wind facilities. *In re Application of High Prairie Wind Farm II, LLC for a Certificate of Need for a Large Energy Facility*, MPUC Docket No. PT-6556/CN-06-1428, Order dated December 11, 2006.

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productive “corners” of farmland that do not receive irrigation. PWE plans to utilize such corners wherever possible in order to minimize impacts to productive farmland.

B. Availability of Alternatives: Minn. R. 7849.0250, B.

The Project will be a wind facility generating power from a renewable resource to be sold on the wholesale market to a utility that must satisfy the Minnesota RES or a similar standard in another state. Potential alternatives must be evaluated against three basic criteria:

- cost effectiveness
- proven and commercially-viable technology
- suitability for the project site

PWE was granted an exemption from providing details about non-renewable alternatives that would not contribute to meeting the RES.²⁹

PWE does not have a traditional “system” as defined in the Minnesota rules, and lacks access to a dedicated group of rate-payers that will provide cost-recovery for PWE’s investment in the Project. Because PWE will operate on the wholesale market, capital costs must be kept low and investments must be carefully evaluated in order to keep the power produced by the Project competitive when compared to competing facilities.

PWE considered photovoltaic technologies, hydroelectric, biomass and other emerging technologies as alternatives to the Project. Each is discussed below.

1. Purchased Power: Minn. R. 7849.0250, B. (1)

PWE is an independent power producer that does not operate a traditional utility system. PWE does not purchase power for end-users. The Project is intended to sell power to utilities.

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Purchased power may also not be a renewable resource. PWE was granted an exemption from this data requirement.³⁰

2. Upgrades to Existing Resources: Minn. R. 78.0250, B. (2)

PWE does not have any existing generation facilities that could be upgraded to sell power to utilities in lieu of constructing the Project. PWE cannot provide information for this data requirement, and received an exemption from the MPUC.

3. New Transmission: Minn. R. 78.0250, B. (3)

PWE will only construct an electrical collection system within the project area. Because PWE will market its power on the wholesale market, it does not have a system and cannot construct new transmission facilities to meet future demand. New transmission facilities are also not renewable resources that will enable a utility to meet the RES. PWE received an exemption from this data requirement.³¹

4. No Facility Alternative: Minn. R. 7849.0340

PWE received an exemption from this data requirement,³² which requires a CON applicant to provide information about existing and committed generation and transmission facilities, a discussion of changes in resource requirements and wastes for those facilities based on 11 different factors, and “a description of equipment and measures that may be used to reduce the environmental impact of the alternative of no facility.”³³ PWE does not have a “system” as defined by the Minnesota Rules. Accordingly, PWE cannot supply the information requested by this rule.

²⁹ Exemption Order at 3.

³⁰ See Exemption order, at 3.

³¹ See Exemption order, at 5-6.

³² See Exemption order, at 6.

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The Project will produce renewable power to help a facility meet Minnesota’s RES or a similar standard in another state. The “no facility” alternative would not meet this important goal, and is therefore not an alternative to the Project.

C. Discussion of Proposed Facility and Alternatives

PWE received an exemption from the data requirements of Minn. R. 7849.0250(C)(1)-(9).³⁴ That rule requires a discussion of details about the Project and alternatives identified in the discussion under Minn. R. 7849.0250(B). PWE received an exemption from that rule as well, because non-renewable generation technologies are not true alternatives to a renewable generation facility since they would not help a utility meet the RES. As discussed above, PWE was unable to identify any renewable alternatives that presented the same economic and environmental advantages as the Project. PWE therefore provides only information about the Project in the following discussion.

1. The Project**a. Capacity Cost in Dollars per Kilowatt: Minn. R. 7849.0250, C (1).**

PWE estimates that the total capital cost of the Project will be approximately \$ **[Trade Secret Information Has Been Redacted]** dollars. The Project will have a nameplate capacity of 98.9 to 100 MW (100,000 kW), yielding an *estimated* capacity cost of \$**[Trade Secret Information Has Been Redacted]**/kW, including funding of capital reserve funds and transaction costs. It is important to note, however, that the Project will only supply power to a utility when it is available, meaning that the utility will only pay PWE when the facility is in operation. The largest cost of the project is the purchase and installation of the wind turbines.

³³ Minn. R. 7849.0340 C.

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Many variables could influence the final capacity cost of the Project, and a final number will not be determined until a Power Purchase Agreement has been signed, the MISO interconnection process completed and the an equity partner found for the Project.

b. Service Life: Minn. R. 7849.0250, C (2)

PWE used a 30-year service life for the purpose of estimating capital costs. PWE, however, estimates that the true life of the Project will be significantly longer due to strict compliance with routine maintenance tasks. PWE has plans for sophisticated preventative maintenance monitoring technology. PWE has obtained land leases that can be extended through options to a total term of fifty years.

c. Estimated Average Annual Availability: Minn. R. 7849.0250, C (3)

PWE estimates that the Project will be available for at least 97 percent of the year, and will strive to maximize availability.³⁵

d. Fuel Costs: Minn. R. 7849.0250, C (4)

The Project will not have fuel costs because it is a wind-generation system. The closest analog to fuel costs is land lease payments, the combined total for which will begin at more than **[\$Trade Secret Information Has Been Redacted]** dollars per year and eventually escalate to more than **[\$Trade Secret Information Has Been Redacted]** dollars per year.

³⁴ See Exemption Order at 4.

PUBLIC VERSION – TRADE SECRET INFORMATION HAS BEEN REDACTED**e. Variable Operating and Maintenance Costs: Minn. R. 7849.0250, C (5)**

PWE’s financial plans include funding operating and maintenance costs at approximately \$**[Trade Secret Information Has Been Redacted]** million in the first year, escalating at **[Trade Secret Information Has Been Redacted]** per year. The Project will be composed of 40 to 43 individual turbines, each of which will be continually monitored and subject to routine maintenance procedures. Turbines can be brought offline for maintenance without shutting down the entire Project.

f. Total Cost in current dollars of a kilowatt hour: Minn. R. 7849.0250, C (6)

Many variables could influence the final capacity cost of the Project, and a final number will not be determined until a Power Purchase Agreement has been signed, the MISO interconnection process completed and the an equity partner found for the Project. PWE has not yet entered into a power purchase agreement, and therefore cannot provide a final delivered cost per kWh to a utility. PWE estimates that the per kilowatt hour price for the power produced by the Project will be approximately \$**[Trade Secret Information Has Been Redacted]**/kWh.

g. Effect on Rates: Minn. R. 7849.0250, C (7)

An applicant for a CON must estimate a proposed Project’s “effect on rates system-wide and in Minnesota, assuming a test year beginning with the proposed in-service date.” PWE, like other entities that will operate on the wholesale market, does not have a “system” as defined by

³⁵ Based on discussions between PWE and Nordex representatives. The final number will be determined by the terms of the Turbine Supply Agreement between PWE and Nordex.

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the Rules. PWE is not a regulated utility, and is not subject to rate regulation.³⁶ PWE cannot supply the requested data.

As an individual facility with a nameplate capacity of 100 MW, the Project by itself is unlikely to have any measurable impact on electric rates in Minnesota. When the Project is aggregated with other existing, planned and potential renewable generation, however, the potential impact on rates becomes significant. As noted above, wind power is typically sold under long-term, fixed price contracts. This allows a utility to mitigate impacts of natural gas price fluctuations. In addition, increased wind generation may lower the demand for natural gas imports, reducing geopolitical risk and transportation costs in the fuel supply for electric generation. This, in turn, may lower or stabilize rates paid by consumers.

h. Efficiency: Minn. R. 7849.0250, C (8)

The Project will not burn fuel, making it impossible to provide an efficiency rating that can be compared to non-renewable generation.

2. Solar Generation: Minn. R. 7849.0250, C. (1-8)

Solar power is not a more reasonable and prudent alternative to the Project due to significantly higher costs. The Energy Information Administration (“EIA”) recently estimated that the installed cost of a photovoltaic system is between \$5,879 and \$6,171 per kWh.³⁷ This is many times more than the cost of the Project.³⁸

PWE did not further explore solar generation due to the extreme disparity in land impacts, as discussed below, and cost between a 100 MW solar facility and the Project.

³⁶ See Exemption and Variance Request, at 4.

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Accordingly, PWE is unable to estimate the service life, average annual availability, operation and maintenance costs per kilowatt hour, or efficiency (expressed as an estimated heat rate) for a solar generation facility.

3. Hydroelectric Generation: Minn. R. 7849.0250, C. (1-8)

Hydroelectric power, like solar power, is not a more reasonable and prudent alternative to the Project. Minnesota currently has 195 MW of hydroelectric generation, with the potential to add another 137 MW distributed among 40 different sites around the state.³⁹ The planned nameplate capacity for the Project is 100MW, an amount that is nearly as much as the potential hydroelectric generation capacity across the entire State. Developing 100 MW of hydroelectric generation at scattered sites across the state is likely to be significantly more expensive, take longer than construction of the Project, and may have a greater environmental impact. The Project site is not suited to hydroelectric generation because it lacks a large-scale water supply. PWE did not further explore hydroelectric generation due to the lack of available water resources at the project site. PWE is unable to estimate service, the service life, average annual availability, operation and maintenance costs per kilowatt hour, or efficiency (expressed as an estimated heat rate) for a hydroelectric generation facility.

³⁷ Energy Information Administration, *Assumptions to the Annual Energy Outlook 2010: Electricity Market Module*, April 2010, Table 8.2, p. 91. Available online at <http://www.eia.doe.gov/oiaf/aeo/assumption/> (last visited April 28, 2010).

³⁸ *Id.*

³⁹ Minnesota Office of Energy Security, *Energy Policy and Conservation Report, 2008* (“2008 Quad Report”) at p. 29. Available online at http://www.state.mn.us/mn/externalDocs/Commerce/Quadrennial_Report_2008_091509012935_2008-QuadReport.pdf (last visited April 28, 2010).

PUBLIC VERSION – TRADE SECRET INFORMATION HAS BEEN REDACTED**4. Biomass Generation: Minn. R. 7849.0250, C. (1-8)**

Biomass generation technologies include biomass combustion, biomass digestion and biomass decay. Biomass combustion requires a steady supply of suitable fuel. Biomass digestion utilizes anaerobic digestion systems to produce biogas. Biomass decay systems generate power by burning methane gathered from landfills.⁴⁰

Biomass generation is more expensive than wind generation. The EIA estimates that that a biomass facility will cost between \$3,414/kWh and \$3,849/kWh, which is significantly higher than that of the Project.⁴¹

Biomass combustion is typically fueled by waste from logging, manufacturing or other operations.⁴² This introduces a fuel-cost and supply problem that is not faced by the Project. Fuel prices will also depend on market factors that are not present for wind generation. Although biomass generation is a renewable resource, PWE believes that its environmental impact is greater than that of the Project.

Biomass combustion facilities occupy a single large footprint instead of the distributed nature of wind generation. In addition to the plant site, fuel must be gathered and transported to the site, producing emissions from transportation equipment. Biomass combustion emits particulate matter and other pollutants into the atmosphere, and a biomass generation facility would require water resources for cooling. PWE also anticipates that emission of particulate

⁴⁰ 2008 Quad Report at 25-27.

⁴¹ Energy Information Administration, *Assumptions to the Annual Energy Outlook 2010: Electricity Market Module*, April 2010, Table 8.2, p. 91. Available online at <http://www.eia.doe.gov/oiaf/aeo/assumption/> (last visited April 28, 2010).

⁴² Minnesota Office of Energy Security, *Energy Policy and Conservation Report, 2008* at p. 25. Available online at http://www.state.mn.us/mn/externalDocs/Commerce/Quadrennial_Report_2008_091509012935_2008-QuadReport.pdf (last visited April 28, 2010).

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matter would create opposition to a renewable generation facility in the Project Area. The Project avoids nearly all of these impacts by using wind power.

Biomass digestion requires significant amounts of manure to generate power at an economical rate. A dairy farm must have a minimum of 400 head to produce electricity without additional funding.⁴³ The MPUC recently approved a power purchase agreement between Xcel Energy and Diamond K Dairy, Inc., through which Xcel committed to purchase the power produced by a 350kW methane digester operated by the dairy.⁴⁴ If 1,000 head are required to sustain a 350kW biomass digestion facility, approximately 285,700 head of dairy cattle would be needed to support a 100 MW facility that would be an equivalent to the Project.⁴⁵ PWE does not believe that collecting and transporting manure from that quantity of cattle would be economical or environmentally feasible.

Biogas from landfill decay requires a sufficient number of large landfills. PWE has not fully investigated the available landfill resources in the Project area, but based on the status of landfill gas production in 2008, PWE does not believe that landfill gas generation is a viable alternative to the Project.⁴⁶

Biomass generation is not a reasonable and prudent alternative to the Project, and was not explored further by PWE. PWE is therefore unable to estimate the service life, average annual

⁴³ 2008 Quad Report at 26.

⁴⁴ MPUC Order Approving Xcel Power Purchase Agreement with Diamond K, August 26, 2010, MPUC Docket No. E-002/M-10-486.

⁴⁵ 100 MW is equal to 100,000 kW. A 100,000 kW facility is 285.7 times the size of the 350 kW facility operated by Diamond K Dairy (100,000 divided by 350 = 285.7). If Diamond K Dairy requires 1,000 head to maintain its facility, PWE would require the manure from 285,700 head of cattle to generate 100 MW of electricity (285.7 x 1,000).

⁴⁶ See 2008 Quad Report at 27.

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availability, operation and maintenance costs per kilowatt hour, or efficiency (expressed as an estimated heat rate) for the three types of biomass generation facilities.

5. Emerging Technologies: Minn. R. 7849.0250, C. (1-8)

Some emerging technologies, such as pumped hydroelectric generation, compressed air generation and magnets are available, but have not advanced enough to be considered true alternatives to the Project.

The Project site cannot be easily adapted to a pumped hydroelectric generation facility. This technology requires water to be pumped to a height and then run through a turbine via gravity. The topography of the area is not well-suited to this technology because it lacks extreme elevations. There are potential water sources nearby, but use this technology would need to draw water from small regional lakes, which would have potentially adverse environmental impacts.

PWE is aware of one proposal for a pumped storage facility in Minnesota, located near Granite Falls. That proposal by Nelson Energy Group would construct a \$2 billion dollar, 250 MW facility by boring 1,800 feet underground. Water would be held in an above-ground storage tank, and then allowed to drop through pipes to the underground turbines, where it would be stored in underground tanks to be pumped back to the surface during off-peak hours. Such a facility does not add net generating capacity to the grid, but rather assists with meeting peak demand loads on short notice during the day. As such, it is not a true alternative to the project, and is likely only economically feasible on such a large scale.⁴⁷

⁴⁷ “Hydro-electric power station being considered for the GF area,” Phillip Bock, Marshall Independent, September 2, 2010, available online at <http://www.marshallindependent.com/page/content.detail/id/518563.html?nav=5015> (last visited September 29, 2010).

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Compressed air generation requires special geologic conditions that, to the best of PWE's knowledge, are not present on the project site or in the area. This technology is not proven to be commercially viable, and is not an alternative to the Project.

Power generation from superconducting magnets is also not a viable alternative as it remains unproven.

PWE was unable to obtain an estimated service life, average annual availability, operation and maintenance cost per kilowatt hour, or efficiency (expressed as an estimated heat rate) for these emerging technologies.

D. Map of System: Minn. R. 7849.0250, D.

The Project received an exception from this data requirement because it does not have a system as defined in the Minnesota Rules. Instead, a map of the proposed Project Site is included as Figure Two, located at the end of the Application.

IV. Demand for the Project**A. Regional Demand for Renewable Energy: Minn. R. 7849.0270**

Part 7849.0270 of the Minnesota Rules requires a discussion of the peak demand and annual consumption forecast that demonstrate the need for the proposed facility. PWE received an exemption from this data requirement, and instead provides information about regional demand for power generated from renewable resources.⁴⁸ The following information is organized according to the criteria for CON approval specified in Minn. R. 7849.0120.

⁴⁸ Exemption Order at 4.

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- 1. Denial of The Application Would Harm the Ability of Utilities in Minnesota and the Surrounding Region to Meet Renewable Energy Objectives, Enable Community-Based Energy Development Projects and Provide Economic Service to Consumers: Minn. R. 7849.0120, A.**

The Project is a vital and needed facility that will assist a Utility in Minnesota or the surrounding region to meet renewable energy objectives. Constructing the Project will also further Minnesota's goal of utilizing Community-Based Energy Development projects to meet future demand for electric power.⁴⁹ The Project may also provide a positive influence on the retail rates paid by consumers in the region, all while utilizing a clean, renewable source of energy. Denying this application will adversely impact utilities and consumers in the region.

The Project will have a nameplate capacity of 100 MW all produced from wind power. All power produced by the Project will be sold to a utility under a power purchase agreement at the wholesale level. Utilities in Minnesota and the surrounding region need the power produced by the Project in order to meet state-mandated renewable energy goals.

Minnesota Utilities must meet or make a good-faith effort to achieve certain milestones leading up to the full "20x'25" REO. Those milestones are expressed in Table 3, below.

⁴⁹ Minn. Stat. § 216B.1612.

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Table 3		
Renewable Energy Objectives		
(percentage of total retail electric sales to retail customers in Minnesota)		
Year	Renewable Energy Goal⁵⁰	Renewable Energy Goal (Xcel Energy)⁵¹
2010	7%	15%
2012	12%	18%
2016	17%	25%
2020	20%	30% ⁵²
2025	25%	--

Minnesota utilities are currently on track to meet their goals for 2010. The Minnesota Office of Energy Security recently supplied a report to the Minnesota Legislature titled “Progress on Compliance by Electric Utilities with the Minnesota Renewable Energy Objective and the Renewable Energy Standard.”⁵³ In that report, OES noted that utilities appear to be on track to meet their 2010 goals of supplying seven (7) or fifteen (15) percent of their total retail electric sales in Minnesota from renewable sources.⁵⁴ For the purposes of that report, “renewable resources” were defined as solar, wind, hydroelectric generators with less than 100 MW

⁵⁰ Minn. Stat. § 216B.1612, Subds. 2, 2a(a).

⁵¹ Excel Energy operates the only nuclear power facility in Minnesota. Minn. Stat. § 216B.1691, subd. 2a(b) places more stringent requirements on a utility that owned a nuclear generating facility as of January 1, 2007.

⁵² 24% of this amount must be generated by wind. Minn. Stat. § 216B.21241, Subd. 2a(b).

⁵³ Available online at

http://www.state.mn.us/mn/externalDocs/Commerce/Compliance_with_Renewable_Energy_Objectives_011509024_141_Renewable_Energy_Objective_Compliance.pdf. Last visited April 21, 2010.

⁵⁴ *Id.* at 1.

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capacity, hydrogen and biomass.⁵⁵ Wind generation, however, accounted for the majority of the power used to meet the REO in 2007. In that year, 3,121,257 MWh's were generated from renewable sources, accounting for 4.7% of total Minnesota retail electric sales. Wind generation composed approximately 47% of that amount.⁵⁶ OES stated that utilities included in the report planned to add 2,100 MWs of renewable generation by 2010. About 1,900 MW of that amount was expected to be produced by wind.⁵⁷ That amount, however, is merely the tip of the iceberg that is the demand for renewable generation to meet the Minnesota "20x'25" standard. That amount, in turn, is almost nothing compared to what will be required if a national REO is adopted.

The Midwest Transmission Owners ("MTO"), a group of utilities that own or operate transmission lines in Minnesota, filed its 2009 Biennial Transmission Report with the MPUC on November 2, 2009.⁵⁸ The MTO projects that by 2025, Minnesota Utilities will need an additional 6,856 MW of renewable generation capacity in order to reach the "20x'25" RES.⁵⁹

This amount is slightly lower than earlier estimates that used a 30% capacity factor.⁶⁰ In 2008, the MTO filed a Supplemental Compliance Filing with the MPUC.⁶¹ At that time, the utilities composing the MTO estimated that they would need 6,696 MW of additional renewable

⁵⁵ *Id.* at 4.

⁵⁶ *Id.* at 8.

⁵⁷ *Id.*

⁵⁸ *In re 2009 Biennial Transmission Projects Report and Renewable Energy Standards Report*, 2009 Biennial Transmission Report, filed November 2, 2009, MPUC Docket No. 09-602.

⁵⁹ *Id.* at 317.

⁶⁰ PWE is not aware of the capacity factor used for the 2009 Biennial Report.

⁶¹ *In re 2007 Biennial Transmission Projects Report and Renewable Energy Standards Report*, Supplemental Compliance Filing of the Minnesota Transmission Owners filed September 11, 2008, MPUC Docket No. E999/M-07-1028 at p. 14.

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generation to meet the RES in 2025.⁶² That number fell to 5,662 MW using a 35% capacity factor, and fell further to 4,879 MW using a 40% capacity factor.⁶³ Even factoring in a conservation goal of 1.5% and using the most optimistic capacity factor of 40%, the 2008 estimates showed an additional requirement for 4,748 MW of renewable generation.⁶⁴

The MTO's 2009 estimates now predict a shortfall of 2,100 MW of renewable generation by 2025.⁶⁵ The Project will help reduce that shortfall by making 100 MW of renewable generation available to a utility subject to the RES. Denying this application, on the other hand, will make it more difficult for utilities to meet the REO and Minnesota's demand for renewable energy.

Minnesota is not the only state with renewable energy objectives or goals. Due to the nature of the power grid, there is no guarantee that renewable energy projects sited in Minnesota will supply power to a utility serving Minnesota. Indeed, in order to meet the renewable energy goals or standards they are subject to in other states, members of the MTO estimate that a further 1,482 MW of generation capacity will be required by 2025.⁶⁶ Competition for renewable energy generation in North Dakota, South Dakota, Iowa, Illinois and Wisconsin will increase the demand for the power produced by the Project. Denying this application will reduce the potential

⁶² *In re 2007 Biennial Transmission Projects Report and Renewable Energy Standards Report*, Supplemental Compliance Filing of the Minnesota Transmission Owners filed September 11, 2008, MPUC Docket No. E999/M-07-1028 at p. 14

⁶³ *In re 2007 Biennial Transmission Projects Report and Renewable Energy Standards Report*, Supplemental Compliance Filing of the Minnesota Transmission Owners filed September 11, 2008, MPUC Docket No. E999/M-07-1028 at pp. 15-16.

⁶⁴ *In re 2007 Biennial Transmission Projects Report and Renewable Energy Standards Report*, Supplemental Compliance Filing of the Minnesota Transmission Owners filed September 11, 2008, MPUC Docket No. E999/M-07-1028 at p. 14

⁶⁵ *In re 2009 Biennial Transmission Projects Report and Renewable Energy Standards Report*, 2009 Biennial Transmission Report, filed November 2, 2009, MPUC Docket No. 09-602 at p. 325.

⁶⁶ *In re 2009 Biennial Transmission Projects Report and Renewable Energy Standards Report*, 2009 Biennial Transmission Report, filed November 2, 2009, MPUC Docket No. 09-602 at p. 317.

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supply of wind generated power, making it more difficult for all utilities in Minnesota and the surrounding region to meet renewable energy production standards or goals.

Adoption of a national renewable energy standard will create nearly insatiable demand for wind generation. The Department of Energy released its “20% Wind Energy by 2030” report in July 2008. The Department of Energy estimated that the United States will consume 5,800,000,000 Megawatt-hours (“MWh”) of electricity in 2030.⁶⁷ Using that estimate, The DOE determined that at least an additional 300,000 MW of wind generation capacity would be required to produce 20% of the electricity consumed in the U.S. by 2030.⁶⁸ That report was based on consumption forecasts from the Annual Energy Outlook 2007.⁶⁹ More recent estimates lower the predicted demand for electricity to 5,021,000,000 MWh in 2035.⁷⁰ Despite the lower total consumption forecast, electricity demand is still expected to grow at an average rate of 1% per year.⁷¹ It is apparent that a tremendous amount of wind generation capacity will still be required to provide 20% of total U.S. demand by 2030. Legislation aimed at implementing a similar national standard has been introduced in the U.S. Senate.⁷² Denying this application will add another obstacle to achieving this potential goal.

The Project is vital for another reason. A major constraint on the wind industry’s ability to supply sufficient power to meet the RES is the capacity of the transmission system in Minnesota. Allocation of the costs required to upgrade the transmission system is at the core of

⁶⁷ U.S. Department of Energy. “20% Wind Energy by 2030: Increasing Wind Energy’s Contribution to U.S. Energy Supply.” July 2008 at p. 2.

⁶⁸ *Id.*

⁶⁹ *Id.*

⁷⁰ AEO 2010 Early Release Overview at 10. 5,021 billion (5,021,000,000,000) kilowatt hours equals 5,021,000,000 MWh’s. One MWh is equal to 1,000kWh.

⁷¹ *Id.*

⁷² American Renewable Energy Act of 2009, S. 826, introduced to the 111th Congress by Senator Amy Klobuchar.

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this problem. Cost allocation issues have delayed many wind projects in Minnesota due to the significant increases in the capital investment required to construct the wind farm created by the price and allocation of network upgrades. The Project, however, is likely to avoid this obstacle, making it vital that the MPUC approve this application. The Project is currently in the Facility Study portion of the Definitive Planning Phase of the Midwest Independent Transmission System Operator's ("MISO") interconnection process. The Project is MISO Project Number G843. Based on studies conducted to date, it appears that the interconnection cost to connect the Project to the adjacent 115kV GRE transmission line will be minimal. Facilities studies for the Great River Energy substation and Otter Tail Power communications system have been completed. Denying this application for the Project will deny utilities the opportunity to purchase the power output of a facility that has a greater probability of both being constructed and providing power at lower rates when compared to other potential wind facilities.

Approving this application will also further an additional state goal of fostering community-based energy development ("C-BED") projects. PWE's Project qualifies as a C-BED project. Minnesota law requires establishment of a tariff to "optimize local, regional, and state benefits from renewable energy development and to facilitate widespread development of community-based renewable energy projects throughout Minnesota."⁷³ Minnesota utilities subject to the RES are required to evaluate whether C-BED projects can satisfy their need for additional renewable generation. Denying this application will remove a C-BED project that could be used by a utility that needs additional capacity to satisfy the RES.

⁷³ Minn. Stat. § 216B.1612, Subd. 1.

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The Project also has significant economic advantages. The Project will increase tax revenues to Otter Tail County, provide income to landowners through rents and provide construction jobs. Operating the Project may also contribute to reductions in natural gas prices, mitigate rate-payer exposure to potential carbon taxes and, when combined with other renewable energy generation facilities, help mitigate overall electric rates.

The Project will generate production tax revenues per year for Otter Tail County. Land rents from cropland are approximately \$40-\$100 per year, per acre. Land rents from turbines for the project, each placed on two acres, will be \$**Trade Secret Information Has Been Redacted** per acre in years 1-10. Starting in year 11, the per-acre land rent doubles to \$**Trade Secret Information Has Been Redacted** per acre. For the first 10 years of the Project, land rents paid for all turbines will be in excess of \$**Trade Secret Information Has Been Redacted** per year (40 turbines), increasing to over \$**Trade Secret Information Has Been Redacted** per year thereafter. Other payments will be disbursed to local residents for wind rights and good-neighbor contracts.

The Project to the extent possible will use local contractors for construction. The foundations, electrical work and erection of turbines will likely be completed by specialty contractors not located in the area.

The Project, in conjunction with two other C-BED projects currently proposed in the region, anticipates eventual construction of an operations center. That center is projected to be the base office and dispatch facility for approximately 10 full-time employees. Some of these jobs will be very specialized and all will pay competitive salaries. The operations center is expected to be located within the PWE Project area.

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The Project will also diversify economic activity directly and indirectly through spin off dollars that will be spent during the construction phase and over the life of the Project. As indicated above, these dollars will come through land rents, local turbine ownership, taxes, and an operations and maintenance facility. During the construction phase, the economic benefits to the local community include, but are not limited to, restaurant and retail services, lodging, fuel, and property rental (residences). The Project will have a significant economic impact on the county, townships and local community. Denying this application will eliminate those economic advantages to the area.

The Project will also have beneficial economic impacts on the regional or national levels. Electricity prices are closely linked to natural gas prices.⁷⁴ Published estimates show the scale of the potential impact of wind generation on rates of natural gas consumption. In 2005, AWEA estimated that wind generation would save over 500,000,000 cubic feet of natural gas per day by the end of 2006.⁷⁵ AWEA also estimates that establishing a national 20% wind energy standard by 2030 would result in \$128 billion in consumer savings by replacing variable-priced natural-gas based generation with fixed-price wind generation.⁷⁶ Achieving a 20% by 2030 standard would reduce electric utility natural gas consumption by 50%, coal consumption by 18% and eliminate the need for 80 GW of new coal generation capacity.⁷⁷ Finally, achieving a 20% by 2030 national standard would reduce consumer exposure to potential carbon regulation costs by

⁷⁴ AEO 2010 Early Release Overview at 4.

⁷⁵ AWEA, “Economics of Wind Energy”, February 2005, available online at <http://www.awea.org/pubs/factsheets/EconomicsofWind-Feb2005.pdf> (last visited April 26, 2010).

⁷⁶ AWEA, “Wind Energy for a New Era: An Agenda for the New President and Congress”, November, 2008 at 2, available online at http://www.newwindagenda.org/documents/Wind_Agenda_Report.pdf (last visited April 26, 2010).

⁷⁷ *Id.* at 2, citing U.S. Department of Energy, “20% Wind Energy by 2030: Increasing Wind Energy’s Contribution to U.S. Energy Supply”, July 2008.

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\$98 billion.⁷⁸ Given these cost savings, approving this application and permitting the Project will contribute to substantial long-term economic benefits to consumers.

For these reasons, denying this application would result in an adverse effect upon the future adequacy, reliability, or efficiency of energy supply to the applicant, to the applicant's customers, or to the people of Minnesota and neighboring states.

2. No More Reasonable and Prudent Alternative has Been Demonstrated: Minn. R. 7849.0120, B.

The Project is the best alternative to meet state and regional renewable energy needs. The Project will provide energy for sale on the wholesale market to utilities that need to increase their renewable generating capacity to meet the RES. As discussed in PWE's Request for Exemptions and Variance, fossil-fueled or otherwise non-renewable generating sources are not alternatives to the Project. Other renewable generation technologies are not well-suited to the site, more expensive, remain unproven, or fail to provide the same economic advantages as the Project. Choosing some alternatives, such as biomass, over wind generation would also eliminate the public support generated by the Project. Finally, changing to an alternative generation technology would likely halt renewable generation development on the site, thereby eliminating the significant economic advantages presented by the Project.

3. The Prairie Wind Energy Project Will Benefit Society in a Manner Compatible with the Natural and Socioeconomic Environments: Minn. R. 7849.0120, C

The Project will provide numerous benefits to society. The primary benefit of the Project is production of power through wind generation without air pollution or other environmental

⁷⁸ *Id.*

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hazards associated with traditional generation. The local and national economies will also benefit from construction and operation of the Project.

The fact that the Project will generate power from the wind, instead of fossil resources, is the largest benefit to the natural environment. Wind is considered a renewable technology because it does not produce the emissions, does not require transportation of fuel to the site, and has a much lower overall impact on the land compared to competing fossil-fuel or renewable technologies.

The Project will have some impact on the natural environment. An average of two acres per turbine may be taken out of agricultural production due to construction of access roads, turbines and transformers. Access roads will be created for construction and turbine maintenance. An underground power and communication system will be created, along with sections of overhead collector lines.

The Project's turbines are laid out to minimize impacts to landowners, farming operations and environmental concerns as well as to maximize production from available land and current leases held. Farming operations in the area are heavily irrigated through the use of center pivots. The Project intends to use less productive dry (non-irrigated) corners of agricultural fields to locate many turbines. Normal farming operations will be able to continue on the overwhelming majority of the Project area. PWE will comply with all applicable laws and permits during the construction process.

The Project is laid out to minimize environmental impact while gaining the best use of the wind resource given the land available, have the least infringement upon local landowners and other citizens, and be economical from a construction perspective. During the ongoing

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planning process, the Project is also considering noise and shadow flicker issues and as well as wind rights not obtained from some land owners within the footprint and not necessary to construct the Project. Additional information regarding environmental impacts will be provided in the companion Site Permit Application.

The Project will have positive impacts on the socioeconomic environment. Land rents for turbine sites will be significantly higher than for crops, as discussed above. Other payments will be disbursed to local residents for wind rights and good-neighbor contracts. All of these payments are expected to be largely recycled into the local economy.

The Project will use local contractors for construction to the extent possible. The foundations, electrical and erection of turbines will likely be completed by specialty contractors not located in the area. Local workers and specialty contractors, however, are all expected to spend money in the local area during the construction process. Wages paid to local workers will remain in the project area.

The Project, in conjunction with two other community based energy developments currently proposed in the region, anticipates an eventual operations center which is projected to hire approximately 10 full time employees. Some of these jobs will be very specialized and all will provide competitive wages. The operations center is expected to be located within the PWE Project area.

Generally, the Project will diversify economic activity directly and indirectly through spin off dollars that will be spent during the construction phase and over the life of the Project. As indicated above, these dollars will come through land rents, local turbine ownership, taxes, and an operations and maintenance facility. During the construction phase, the economic benefits

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to the local community include, but are not limited to, restaurant and retail services, lodging, fuel, and property rental (residences). This Project will have a significant beneficial economic impact on the county, townships and local community.

On a broader scale, the Project will help contribute to a cleaner environment and a more secure energy supply. The Project will have no air emissions during normal operations.⁷⁹ This is a key detail. There will be no carbon, sulfur dioxide, nitrogen dioxide, mercury or particulate matter expelled into the environment as there would be with traditional or some biomass generation technologies. The U.S. Department of Energy recently estimated that producing 20% of the nation's power from wind by 2030 would result in avoiding 7,600 *million* metric tons of carbon dioxide by 2030.⁸⁰ Reducing the demand for natural gas used to produce power will contribute to energy security by reducing the need to import liquefied natural gas from less-than-stable nations.⁸¹

Denying this application and preventing construction of the Project will avoid the slight environmental impacts to the site. That action, however, will eliminate all of the benefits to society. Balancing the very limited environmental harm against the tremendous social and environmental benefits indicates that this application should be approved.

⁷⁹ Construction and maintenance activities may have some negligible air emissions from vehicles.

⁸⁰ U.S. Department of Energy, "20% Wind Energy by 2030: Increasing Wind Energy's Contribution to U.S. Energy Supply", July 2008, p. 14. A metric ton is approximately 2,204 pounds.

PUBLIC VERSION – TRADE SECRET INFORMATION HAS BEEN REDACTED**4. The Prairie Wind Energy Project is Consistent with Federal, State, and Local Rules and Policies****a. The Project is Consistent with Minnesota Energy Policy**

Minnesota's energy policy favors construction of the Project. Minnesota's policy is expressed in the RES, which requires 25% of retail electric sales in the state to be from renewable power by 2025.⁸² Before a utility in the state can construct a new fossil-fuel fired generating facility, it must first demonstrate that it cannot meet the expected demand through renewable generation.⁸³

Minnesota law also provides significant tax incentives for wind generation facilities such as the Project. Under Minnesota law, the real and personal property composing the Project will be exempt from state property taxes.⁸⁴ All materials used to manufacture, construct, install and maintain or replace the Project are exempt from state sales tax.⁸⁵ The Project will pay a production tax instead of property taxes, as discussed above.

Another aspect of Minnesota energy policy is the transmission system required to move the power produced by the Project to the retail customer. The Project has been sited to use an existing 115 kV transmission line, and will not require constructing a new line in either a new or an existing utility right-of-way. This is consistent with the state's commitment to non-proliferation of utility routes across the state.

⁸¹ *Id.* at 16.

⁸² Minn. Stat. § 216B.1691, subd. 2a.

⁸³ Minn. Stat. § 216B.243, subd. 3a.

⁸⁴ Minn. Stat. § 272.02, subd. 22.

⁸⁵ Minn. Stat. § 297A.68, subd. 12.

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A certificate of need should be granted to PWE for the Project because, as a wind generation system, it is the preferred method of new power generation under Minnesota law. The Project is exactly the type of facility that Minnesota's energy policy is designed to foster.

b. The Project is Consistent with Federal energy Policy**(i) Federal Tax Incentives for Renewable Energy Facilities**

Federal energy policy also supports construction of the Project. Federal support is expressed primarily through the Internal Revenue Code, which contains a menu of three major incentives to support wind development. Those incentives are the Production Tax Credit, the Investment Tax Credit and the use of the Modified Accelerated Cost Recovery System. Outside of tax law, federal law also provides the opportunity for project developers, such as PWE, to obtain grants from the United States Treasury in lieu of the Investment Tax Credit.

The Production Tax Credit, available for the first decade of operation, is equal to 1.5 cents per kWh of power sold by a renewable generation project.⁸⁶ Availability of the PTC influences the growth in renewable energy generation.⁸⁷

The Investment Tax Credit is an alternative incentive created by the American Recovery and Reinvestment Act of 2009.⁸⁸ Developers like PWE can elect to take advantage of the Investment Tax Credit instead of the Production Tax Credit. Under the Investment Tax Credit, renewable energy project developers can claim a 30% credit.⁸⁹ To claim the credit, the Project must be placed in service between 2009 and 2012.

⁸⁶ 26 U.S.C. § 45(a).

⁸⁷ AEO 2010 Early Release Overview at 10; *See also* AWEA, *Wind Energy for a New Era: An Agenda for the New President and Congress*, November, 2008 at 8.

⁸⁸ Cite:

⁸⁹ Cite:

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In addition, the Modified Accelerated Cost Recovery System allows investments in wind projects to be recovered more quickly through depreciation.⁹⁰

Finally, the American Reinvestment and Recovery Act created an option for developers to receive a grant from the U.S. Treasury equal to the amount of the Investment Tax Credit for which a project would otherwise be eligible. To receive the grant, a project must either be placed in service in 2010 or have begun construction by the end of 2010 and achieve commercial operation by 2012.

(ii) The Potential for a National RES Supports Construction of the Project.

Legislation aimed at implementing a similar national standard has been introduced in the U.S. Senate,⁹¹ and a bill calling for a renewable electricity trading program has been introduced in the United States House of Representatives.⁹² According to a recent study by the Department of Energy, the United States will consume 5,800,000,000 Megawatt-hours (“MWh”) of electricity in 2030.⁹³ Using that estimate, The DOE determined that at least an additional 300,000 MW of wind generation capacity would be required to produce 20% of the electricity consumed in the U.S. by 2030.⁹⁴ The Project will contribute to the total wind generation capacity of the United States and help a utility meet either Minnesota’s RES or the renewable energy objectives of another state.

⁹⁰ 26 U.S.C. § 168.

⁹¹ American Renewable Energy Act of 2009, S. 826, introduced to the 111th Congress by Senator Amy Klobuchar.

⁹² American Renewable Energy Act, H.R. 890, introduced to the 111th Congress by Rep. Edward Markey.

⁹³ U.S. Department of Energy. “20% Wind Energy by 2030: Increasing Wind Energy’s Contribution to U.S. Energy Supply.” July 2008 at p. 2.

⁹⁴ *Id.*

PUBLIC VERSION – TRADE SECRET INFORMATION HAS BEEN REDACTED**(iii) The Project Will Comply with Federal, State, and Local Environmental Regulations**

The Project will comply with all relevant regulations. A list of permits required for construction of the Project is provided below in Part VII of this application.

B. Additional Demand Information**1. System Capacity: Minn. R. 7849.0280**

PWE requested and received an exemption from this data requirement because it does not operate a system as it is defined in the Minnesota Rules.⁹⁵

2. Conservation Programs: Minn. R. 7849.0290

PWE requested and received an exemption from this data requirement because it will not provide power directly to consumers, and as such, will not have a demand-side management program.⁹⁶

3. Consequences of Delay: Minn. R. 7849.0300

PWE received an exemption from this data requirement.⁹⁷ The Project does not have a system as defined in the Minnesota Rules, and PWE is therefore unable to discuss the “anticipated consequences to its system, neighboring systems, and the power pool should the proposed facility be delayed one, two, and three years, or postponed indefinitely.”⁹⁸ The consequence of delay in constructing the Project, however, would be grave for both PWE and utilities that must satisfy the RES.

⁹⁵ Exemption Order at 4.

⁹⁶ Exemption Order at 5.

⁹⁷ Exemption Order at 5.

⁹⁸ Minn. R. 7849.0300.

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The marketplace for wind generation facilities is subject to numerous and varying external factors. Market conditions change rapidly and determine the type and price of wind turbines, gathering system requirements, construction materials and construction services.

The regulatory environment is also constantly changing. Several federal tax incentives are currently available for renewable energy production. First, the Production Tax Credit (“PTC”) makes wind energy cost-competitive with power produced from fossil fuels. This credit is available for the first 10 years of a renewable energy plant’s operating life, but projects cannot establish eligibility for the credit after December 31, 2012. Current Internal Revenue Service (IRS) rules allow PWE and potential equity partners to recover investments in the Project through depreciation deductions. Using the Modified Accelerated Cost Recovery System, PWE could recover some costs before the PTC expires. The American Recovery and Reinvestment Act (ARRA) of 2009, commonly referred to as the stimulus bill, created a temporary Investment Tax Credit (ITC) that can be selected instead of the PTC. The ITC is a 30 percent credit for wind energy projects placed in service between 2009 and 2012. Projects selecting the ITC are not eligible for the PTC. A final time-sensitive option for PWE is selection of a U.S. Treasury grant equal to the ITC if construction of the Project starts by the end of 2010 and the Project is in service by 2012. These incentives are all time-sensitive, and any delay will harm PWE’s ability to take advantage of these important financial incentives.

The consequences of delay to utilities that are potential customers for PWE and to society are also significant. If the Project is delayed, or if the MPUC does not permit the Project, utilities will lose a vital opportunity to purchase renewable power needed to meet the RES or

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similar requirements in other states. If a federal RES is adopted, the demand for renewable generation will increase significantly, making the Project even more vital.

V. Environmental Data for the Project and Alternatives**A. Land Requirements: Minn. R. 7849.0320, A.****1. The Project**

PWE has leases and easements over 8,000 acres. The leases and easements are sufficient to support 40 to 43 turbines, access roads, wind rights, the substation and the operations and maintenance facility. The preliminary site layout includes a five to ten rotor-diameter distance between turbines. The turbines are also sited to utilize lower-yield corners of irrigated farmland. Overall turbine spacing is dictated by prevailing winds, topography, land availability and the need to minimize impacts to productive farmland. Setbacks between roads and residences are being designed to minimize noise and shadow-flicker issues. Construction, maintenance and operation of the turbines will require installation of approximately 12 miles of all-weather gravel roads. The roads will be sloped to prevent pooling from rain, and culverts will be placed in appropriate locations.

The Project is located in an agricultural area. The Project will impact approximately 135 acres during construction. This is a small fraction of the 23,921 acre project site. PWE is designing its project so that it will not be necessary to relocate any residences or businesses. As discussed elsewhere in this application, PWE is also designing the Project's turbine layout to impact un-irrigated farmland wherever possible. When constructed, the Project is expected to occupy a total footprint of 135 acres, distributed throughout the Project Site. Five of those acres will be dedicated to an operations and maintenance facility.

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The Project will not require any land for water storage or cooling systems. A small amount of space inside the planned operations and maintenance facility will be used to store oil, lubricants and some waste materials. Wastes produced during construction and operation will be removed from the site and disposed of according to federal, state and local laws.

2. Solar Generation

A 100 MW photovoltaic generation facility has a significantly greater environmental impact due to a larger, more concentrated footprint. The United Arab Emirates recently announced plans to construct a 100 MW solar facility in the desert near Abu Dhabi. This facility is expected to occupy approximately 2.5 square kilometers (617.76 acres) of land.⁹⁹ Likewise, Southern California Edison recently signed an agreement with ProLogis to construct a 100 MW photovoltaic system on up to 15,000,000 square feet (344.35 acres) of warehouse roof space owned by ProLogis.¹⁰⁰ Those numbers, of course, are based on the solar resources available in Southern California and the United Arab Emirates. PWE anticipates that an even larger facility would be required in Minnesota.

PWE does not know specifically what land would be required for water storage, cooling systems or solid waste storage would be required for a solar generation system, but notes that various systems use solar energy to heat water or liquefied sodium to operate a generator. These facilities would require water storage areas or cooling systems.

⁹⁹ “UAE’s Masdar partners with Total and Abengoa Solar to build world’s largest CSP plant in Abu Dhabi.” UAE Interact Web site, June 10, 2010, available online at http://www.uaeinteract.com/docs/UAEs_Masdar_partners_with_Total_and_Abengoa_Solar_to_build_worlds_largest_CSP_plant_in_Abu_Dhabi/41385.htm (last visited September 28, 2010).

¹⁰⁰ “Southern California Edison – ProLogis Agreement to Advance Grid Integration of Renewable Generation” Southern California Edison Web site, available online at <http://www.edison.com/pressroom/pr.asp?id=7399> (last visited September 28, 2010).

PUBLIC VERSION – TRADE SECRET INFORMATION HAS BEEN REDACTED**3. Hydroelectric Generation**

Minnesota currently has 195 MW of hydroelectric generation, with the potential to add another 137 MW distributed among 40 different sites around the state.¹⁰¹ PWE was unable to quantify the amount of land that would be required to construct so many individual hydroelectric facilities throughout the state. PWE is unable to quantify what land would be required for cooling systems or solid waste storage for 100 MW of hydroelectric generation capacity.

4. Biomass Generation

Biomass facilities are typically large plants that resemble traditional power plants with the exception of their fuel source. As discussed above, biomass generation is not a feasible alternative to the Project, and PWE was unable to estimate the land requirements for a 100MW biomass generation facility. PWE was unable to quantify the amount of land required for a cooling system, water storage or solid waste storage, such as ash containment facilities.

5. Emerging Technology

PWE has not found an emerging technology that is a feasible alternative to the Project, and was unable to locate definitive information about water storage systems for the emerging technologies listed above. The facility proposed by Nelson Energy Group, discussed above, would require a 135-acre above ground storage reservoir.

¹⁰¹ Minnesota Office of Energy Security, *Energy Policy and Conservation Report, 2008* at p. 29. Available online at http://www.state.mn.us/mn/externalDocs/Commerce/Quadrennial_Report_2008_091509012935_2008-QuadReport.pdf (last visited April 28, 2010).

PUBLIC VERSION – TRADE SECRET INFORMATION HAS BEEN REDACTED**B. Traffic: Minn. R. 7849.0320, B.****1. The Project**

The Project is located northwest of Parkers Prairie, Minnesota. The major roadways in the area are State Highway 235 and State Highway 29. Access to the Project Area will be through those roads, along with various county, township and private roads. Traffic patterns in the area show increased vehicle travel during the summer months. Some short-term traffic impacts may occur when PWE transports oversize loads into the Project area during the construction process. PWE will work with the relevant local authorities to mitigate these impacts as much as possible.

PWE will construct approximately 12 miles of gravel roads for construction and operation of the Project. These roads will be at least 12-feet wide, constructed of class-five material and mesh, as necessary, to provide sufficient strength to accommodate semi-tractors hauling long rotor blades and other heavy equipment. Roads will not be installed on steep slopes or other erosion-prone area. PWE will maintain the newly-constructed roads during operation of the Project. PWE will work with landowners to find the most appropriate location for access roads.

PWE will also work with the Minnesota Department of Transportation, Otter Tail County and the relevant townships to make sure that all appropriate permits are in place before the start of construction. PWE will repair any local roads damaged by the increased traffic during construction. PWE does not anticipate significant traffic once the facility enters commercial operation.

PUBLIC VERSION – TRADE SECRET INFORMATION HAS BEEN REDACTED**2. Solar Generation**

Solar generation is not a feasible alternative to the Project, and PWE was unable to estimate the traffic impact of constructing a solar generation facility of equivalent size to the Project. PWE does not believe that ongoing operation of a solar generation facility would create traffic impacts significantly different from that of the Project.

3. Hydroelectric Generation

Hydroelectric generation is not a feasible alternative because of the lack of a single site capable of generating sufficient power. PWE was unable to estimate the traffic impacts of constructing and operating numerous hydroelectric facilities throughout Minnesota.

4. Biomass Generation

PWE was unable to quantify the exact traffic created by construction and operation of a biomass facility. In general terms, operation of a biomass generation facility would create significant ongoing traffic impacts due to trucks hauling fuel to the facility. Such traffic would adversely impact the rural nature of the Project Site and impact local residents.

5. Emerging Technologies

PWE was unable to quantify the traffic impacts of the emerging technology alternatives discussed above.

C. Water Usage for Alternate Cooling Systems: Minn. R. 7849.0320, E.**1. The Project**

The turbines will utilize self-contained, internal cooling systems that will not require water storage. The Project's water requirements will be limited to potable water for the

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operations and maintenance facility, which may be obtained from a well or municipal water source. All applicable regulations will be followed.

2. Alternatives

PWE was unable quantify water usage for alternative cooling systems for the alternatives identified in this Application.

D. Water Discharges: Minn. R. 7849.0320, F.**1. The Project**

The Project will not discharge water during operation beyond sanitary systems for the operations and maintenance structure. Some limited water discharge may be necessary during construction. PWE will apply for and comply with the terms of any NPDES or other permits required by law. A list of permits is included as Table 5 in Part VII of this Application.

2. Alternatives

PWE was unable to quantify water discharges for the alternatives identified in this Application.

E. Radioactive Releases: Minn. R. 7849.0320, G.

The Project will not involve radioactive material, making it impossible for the Project to have a radioactive release. This is also true for the alternatives identified in this Application.

F. Solid Waste: Minn. R. 7849.0320, H.**1. The Project**

The Project is not expected to generate significant quantities of solid waste during operation. PWE will obtain a Small Quantity Generator Permit from the MPCA for storage of used lubricating oils. Domestic waste produced at the operations and maintenance facility or at

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individual turbines during maintenance operations will be disposed of according to state and federal regulations.

2. Alternatives

PWE was unable to quantify the amount of solid waste produced by the alternatives identified in this application. PWE believes that the alternative with the greatest capacity to produce solid waste is biomass generation. Biomass combustion will produce ash and other potentially hazardous solid wastes. Biomass digestion will have a manure-based byproduct for disposal.

G. Noise: Minn. R. 7849.0320, I.**1. The Project**

Each turbine that is constructed for the Project will be a noise source. Noise standards specify that noise levels typically shall be no higher than 50 dBA when measured next to an occupied residence.

Wind turbines create additional noise that varies with the speed of the turbine and the distance of the listener from the turbine. There is more noise on relatively windy days; however, the turbine noise levels are often masked by the same wind that creates the increased noise. Operation of the project may result in periodically audible sound within the adjacent communities under certain operational and meteorological conditions. Occasionally a gentle “swoosh, swoosh” sound may be heard at the closest downwind residential areas.

Turbine noise is dependent on background noise levels and wind speed. Sound generated within the project area will be consistent with that of similar wind energy projects that have been successfully sited throughout Minnesota and the United States under similar noise limits.

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Noise levels are measured in terms of the A-weighted decibel (dBA) scale, which was developed to approximate the human ear’s sensitivity to certain frequencies by emphasizing the middle frequencies and de-emphasizing lower and higher frequencies. This scale, expressed as dBA, best correlates the human response to sound and is commonly used as a descriptor for ambient sound levels. Presently, noise in the proposed project area is dominated by traffic on local roads, agricultural noise and equipment operations noise stemming from the Canadian Pacific Railroad trains that occasionally pass through the area. Table 4, below, provides examples of different noise levels.

Table 4 Decibel Levels of Common Noise Sources	
Source	Decibel Level
Jet Engine (at 25 meters)	140
Jet Aircraft (at 100 meters)	130
Rock Concert	120
Pneumatic Chipper	110
Jackhammer (at one meter)	100
Chainsaw, Lawn Mower (at one meter)	90
Heavy Truck Traffic	80
Business Office, Vacuum Cleaner	70
Conversational Speech, Typical TV Volume	60
Library	50
Nighttime L50 Standard for Wind Turbine Siting	50
Bedroom	40
Secluded Woods	30
Whisper	20

Sound is generated from the wind turbine at points near the hub or nacelle, from the blade rotation and from transformers near ground level. The representative sound power level (Lp) of

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the Nordex N100- 2.5 MW wind turbine, one model that may be used for the Project, is 104.5 dBA measured right next to the nacelle at full power. This was converted to a sound pressure level for comparison to the Minnesota Daytime and Nighttime L10 and L50 Standards given in Minn. R. 7030.0040.

Turbines were modeled using the following equation for a hemispherical point source: $L_p = L_w - 10 \log(2\pi r^2) - A_{atm}$, where L_p is defined as the sound pressure level at the distance of interest (r), L_w is the sound power level provided by the turbine manufacturer for a 2.5 MW turbine, and A_{atm} defined as the attenuation provided by atmospheric absorption. The maximum distance calculated where the turbine noise would no longer exceed the state standard would be at 870 feet for the Nighttime L50 standard of 50 dBA. This standard will be met by the Project layout.

PWE proposes a minimum setback for turbines of 870 feet from occupied residences. In most instances, turbines will be located at least ¼ mile from residences. Noise impact to nearby residents and other potentially affected parties will be taken into account through a noise study which will be conducted prior to construction. The study will give PWE additional guidance on siting turbines to minimize noise impacts. The wind turbines will be sited to comply with or exceed the existing noise standards established by the Minnesota Pollution Control Agency (MPCA) Daytime and Nighttime Limits as stated in Minn. R. 7030.0040.

PUBLIC VERSION – TRADE SECRET INFORMATION HAS BEEN REDACTED**2. Alternatives**

PWE was unable to quantify the noise impacts of project alternatives.

H. Work Force for Construction and Operation: Minn. R. 7849.0320, J.**1. The Project**

PWE will begin construction of the Project as soon as the MPUC permitting is completed, a power purchase agreement has been signed with a utility and the MISO interconnection process is complete. PWE does not yet have an estimate of the size of the workforce to construct the Project. A Balance of Plant contractor will be hired to construct the Project and will use whatever labor is necessary to place the Project in-service by December 31, 2012. PWE intends to use as many Minnesota-based construction firms and local contractors or laborers as possible in the construction process.

PWE anticipates sharing operations and maintenance with two other wind projects in the area, the Glacial Ridge Project (20 MW) and the Bear Creek Project (47.5 MW). The operations and maintenance facility for the Project will also serve those projects. PWE anticipates hiring approximately 10 full-time positions for operations and maintenance.

2. Alternatives

PWE was unable to quantify the work force required for construction or operation of the alternatives discussed above.

PUBLIC VERSION – TRADE SECRET INFORMATION HAS BEEN REDACTED**I. Number and Size of Transmission Facilities: Minn. R. 7849.0320, K.****1. The Project**

The Project's collection of electricity begins in the turbine. Electricity is produced by the turning rotor, which operates a generator. Electricity is stepped-up in a transformer to 34.5 kV. The transformer will be located either in the nacelle of the turbine or at ground level. From the transformer, the power will be fed into a 34.5 kV collection system composed of underground and/or overhead power lines. These lines, located on leased property or public rights-of-way, will feed into a PWE-owned substation constructed for GRE. There, the 34.5 kV current will be converted into 115kV current and delivered into an existing 115 kV transmission line owned by Great River Energy. The electrical interconnection system design will be revised and completed once the MISO interconnection process is complete. The Project will not require any new transmission facilities beyond the internal collection system and substation.

2. Alternatives

PWE does not believe that alternatives to the Project would require transmission facilities beyond those that will be required for the Project.

VI. Transmission and No Facility Alternatives**A. Transmission Alternatives: Minn. R. 7849.0330**

PWE requested and received an exemption from this data requirement because the Project is intended to meet demand for renewable energy generation.¹⁰² An alternative that would consist only of additional transmission lines is not an alternative to the Project.

¹⁰² Exemption Order at 5-6.

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B. No-Facility Alternative: Minn. R. 7849.0340

PWE requested and received an exemption from this data requirement because it does not own or operate a system as defined by the Minnesota Rules.¹⁰³

VII. Additional Information

A. Environmental Report

The Office of Energy Security will prepare an Environmental Report for the MPUC as required by Minn. R. Parts 7849.1200 to 7849.2100.

B. Site Permit

PWE will file its Application for a Site Permit for a Large Wind Energy Conversion System as soon as practicable. PWE requests that the certificate of need and site permit application processes be combined to the extent possible to reduce expense and increase the efficiency of the MPUC review process.

¹⁰³ Exemption Order at 6.

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C. Other Project Permits

PWE will obtain the following permits, if required, for the Project:

Table 5			
Project Permits and Approvals			
Agency	Permit/Approval	Description	Status
Federal Permits			
US Fish and Wildlife Service (USFWS)	Threatened and Endangered Species – Section 7 Consultation	Determination of effect on federally listed species	Not anticipated
Federal Aviation Administration (FAA)	Form 7460-1, Notice of Proposed Construction or Alteration	Required if construction or alteration is within 6 miles of public aviation facility and for structures higher than 200 ft	Ongoing
U.S. Army Corps of Engineers (USACE)	Section 404 Permit	Complete an application under the Clean Water Act for impacts to wetland and waters of the U.S.	To be determined once layout is finalized
U.S. Department of Agriculture (USDA)	Conservation Reserve Program (CRP) Coordination	Coordinate with the USDA regarding project facilities in CRP parcels	To be determined once layout is finalized
	USDA Loan Coordination	Coordinate with the USDA regarding project facilities in parcels under USDA loans	To be determined if necessary
Native American Tribes	Section 106 Consultation	Determination of effect on Native American cultural resources	Not anticipated
State of Minnesota Permits			
Minnesota Public Utilities Commission (PUC)	LWECS Site Permit	Application required for facilities with nameplate capacity greater than 5,000 kW	Anticipated in 2010.
Minnesota Public Utilities Commission (PUC)	Certificate of Need	Application required for Large Energy Facility	Submitted November, 2010
Minnesota State Historic Preservation Office (SHPO) and Office of State Archaeologist (OAS)	Section 106 Consultation (not anticipated), consultation per Minnesota Wind Siting Act (anticipated)	Determination of effect on archaeological and historical resources	Ongoing
Minnesota Pollution Control Agency (MPCA)	General NPDES Permit for Stormwater Discharges Associated with Construction Activities	Stormwater permit required for construction activities	SWPPP will be prepared and NOI will be submitted prior to construction
	Section 401 Water Quality Certification	Impacts to waters of US (USACE Section 404 permit)	To be determined once layout is finalized
	Small Quantity Hazardous Waste Generator License	Generation more than 100 pounds of hazardous waste each year	To be determined once layout is finalized
	Temporary and Permanent Soil Erosion and Sediment Control Plans	Plans will be incorporated into final plans and specifications for project	To be submitted prior to construction and maintained until disturbed areas have been re-vegetated
	Small Quantity Generator Permit	Necessary if any used lubricating oil will be accumulated and temporarily stored on the site	Can be obtained within 45 days after project is placed in operation, if necessary
Minnesota Department of Natural Resources (DNR)	Public Water Works Permit	Any construction activities that impact DNR public waters	To be determined once layout is finalized
	License to Cross Public Land and Waters	Siting facilities on, or crossing over, any State administered Public Lands or Waters	To be determined once layout is finalized
	Wetlands Survey	Determination of effects on public waters and wetlands by tower and road placement	Ongoing

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Minnesota Board of Water and Soil Resources (BWSR)	Wetland Conservation Act Approval	Any construction activities that impact wetlands	To be determined once layout is finalized
Minnesota Department Health	Well Construction Notification	Installation of private well(s) or O&M building	To be determined prior to construction
	Plumbing Plan Review	Plumbing system for O&M building	Will be obtained prior to construction
Minnesota Department of Transportation (MNDOT)	Highway Access Permit	Permit required for any access roads abutting state roads	If necessary, will be obtained after final design is complete
	Utility Access Permit	Permit required for any utility crossing or use within state road ROW	If necessary, will be obtained after final design is complete
	Oversize and Overweight Permit	Permit required for heavy equipment transport over state roads during construction	Will be obtained prior to construction
	Tall Structure Permit	Permit for wind turbines and other tall structures	Will be obtained prior to construction
	Routing Permit for Power Lines	Permit required for any utility crossing of county roads	Will be obtained prior to construction
Local Permits			
Otter Tail County	Driveway Permit	Permit required for access roads abutting county roads	Will be obtained prior to construction
	Utility Permit	Permit required for any utility crossing of county roads	Will be obtained prior to construction
	Moving Permit	Permit required for heavy equipment transport over restricted county highways during construction	Will be obtained prior to construction
	Individual Septic Tank Systems (ISTS) Permit	Connection to existing or approval of onsite sewage and water (O&M building)	If necessary, will be obtained prior to construction
	Utility permit for Ditch Crossings	Any construction activities that impact a County Judicial Ditch	To be determined once layout is finalized
	Wetland Conservation Act Compliance	Set back of 300 feet is required, but no permit needed	To be determined once layout is finalized
Townships	Township Road Access	Possible permit or approval required for township road access	Will be obtained prior to construction
Canadian Pacific Railroad (CPR)	Determination of process and permits for working within railroads right-of-way	The project is working with CPR personnel	Ongoing

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Figure 2: Project Map

