This document is made available electronically by the Minnesota Legislative Reference Library as part of an ongoing digital archiving project. http://www.leg.state.mn.us/lrl/lrl.asp

940487

REPORT OF THE

POWER PLANT SITING ADVISORY TASK FORCE ON WIND POWER IN MINNESOTA

TO THE

MINNESOTA ENVIRONMENTAL QUALITY BOARD

July 7, 1994

REPORT OF THE
POWER PLANT SITING ADVISORY TASK FORCE
ON WIND POWER IN MINNESOTA

JULY 7, 1994

RECEIVED
OCT 10 1994
LEGISLATIVE REFERENCE LIBRARY
STATE CAPITOL
ST. PAUL, MN. 55155

INTRODUCTION

Large-scale development of wind power in Minnesota was initiated by an order of the Minnesota Public Utilities Commission in November 1992, that directed Northern States Power Company to develop at least 50 megawatts (MW) of wind generated electricity by 1997. NSP's stated goal was to have 100 MW by 1997. However, action by the 1994 Minnesota Legislature requires NSP to have 425 megawatts by 2002, and that number could increase due to integrated resource planning requirements of the PUC.

As a consequence, the development of wind power will be accelerated in Minnesota, with much of it likely to take place in southwestern Minnesota along Buffalo Ridge, as shown in Appendix A. The Environmental Quality Board's environmental review of NSP's first 25 MW wind farm on Buffalo Ridge in June 1993 raised numerous questions regarding the regulation of wind power in Minnesota. This wind farm which was officially opened June 2, 1994, is comprised of 73 turbines and other associated facilities. By 2002, NSP must construct and operate, purchase, or contract to construct and operate, another 1,000 to 3,000 or more wind turbines to comply with the 1994 legislative mandate. This mandate requires 425 MW and up to another 400 MW may be required by the PUC's resource planning and least cost planning requirements. Other wind developers may also propose construction of wind energy facilities.

To assist the board in evaluating the appropriateness and applicability of existing environmental and siting regulations to future wind power development in Minnesota, the EQB through the Power Plant Siting Act (Minnesota Statute 116.59, Subdivision 1) approved a resolution in June 1993 establishing an Advisory Task Force on Wind Power in Minnesota. The board authorized the chair of the EQB to appoint members of the task force and its chair. The board approved the following charge:

CHARGE
MINNESOTA ENVIRONMENTAL QUALITY BOARD
1993 POWER PLANT SITING ADVISORY TASK FORCE
ON WIND POWER IN MINNESOTA

1. The 1993 Power Plant Siting Advisory Task Force on Wind Power in Minnesota shall provide advice and recommendations to the Minnesota Environmental Quality Board on the following:

a. How should the Minnesota Environmental Quality Board amend the Power Plant Siting Act and/or rules to better address the environmental issues specific to wind power? And how should the Minnesota Environmental Quality Board address alternate site requirements of the Power Plant Siting Act, given the restrictive geography of wind resource areas?

b. At what level of government and at what threshold of committed or anticipated generating capacity in a given geographic area should wind power development be regulated?

c. For incremental additions of wind generation which fall below the 50 MW threshold of the Power Plant Siting Act, what is the appropriate means (or process) to conduct environmental review and how should cumulative effects be addressed?

d. Are new rules and/or standards specific to wind power necessary to effectively consider turbine noise levels, turbine density, setbacks, siting on prime farm land or near major migratory flyways, and related environmental issues?

e. How should the Minnesota Environmental Quality board address the issue of critical area designation for all wind resource areas?

f. How should the possible need for additional transmission and distribution lines, substations, and backup generation be considered in a regulatory process?

2. The task force shall hold an initial meeting in September 1993 and meet at least once a month thereafter. The task force shall complete its work and present its findings and recommendations to the Environmental Quality Board no later than June 16, 1994.

3. The Task Force is encouraged to hold meetings in the Buffalo Ridge area and other areas of the state where large-scale wind power development could occur as well as in St. Paul. All meetings of the task force are open to the public.

THE TASK FORCE AND REVIEW PROCESS

Nominations of task force members were solicited through the secretary of state's open appointment process. The chair of the board appointed the task force members in September 1993 (see Appendix B) and the first meeting was held October 12, 1993. The task force is comprised of individuals from the Buffalo Ridge area; representatives of environmental groups; individuals with working knowledge of the wind power industry; state agencies; and interested individuals.

The task force met seven times over a period of 10 months. All meetings were open to the public. Notices of the meetings were sent to everyone who expressed an interest in the task force's work.

The first meeting consisted of a tour of wind turbine facilities in Marshall, a tour of the Buffalo Ridge area where construction was underway and presentations by NSP and Kennetech (U.S. Wind Power), the developer of the first 25 MW of wind power on Buffalo Ridge. At subsequent meetings, presentations addressed the PUC's certificate of need requirements, the EQB's environmental review process requirements, the power plant siting review requirements for power plants and transmission lines, the critical areas planning requirements and process, avian impacts associated with wind turbines and turbine generated noise. At the remaining meetings, the task force considered the items in the charge.

The 1993 Power Plant Siting Advisory Task Force on Wind Power in Minnesota has reviewed and considered each charge item and makes the following recommendations:

Charge Item 1 a

> How should the Minnesota Environmental Quality Board amend the Power Plant Siting Act and/or rules to better address the environmental issues specific to wind power? And how should the Minnesota Environmental Quality Board address alternate site requirement of the Power Plant Siting Act, given the restrictive geography of wind resource area?

Recommendation

> *The 1995 Legislature should enact legislation that would exclude wind farm facilities from the requirements of the Power Plant Siting Act (Minnesota Statutes 116C.51 to 116C.69) and establish a site review process specific to wind farm facilities.*
>
> *Exempting wind farm facilities from the Power Plant Siting Act eliminates the alternate site requirement.*

RATIONALE AND DISCUSSION

> The Power Plant Siting Act (Minnesota Statutes 116C.51 to 116C.69) was enacted in 1973. Administrative rules (Chapter 4410) implement the program. The purpose of the program is two-fold:
>
> > To site electric generating plants of over 50 MW and route transmission lines of over 200 kilovolts (kV) in a manner compatible with environmental preservation and the efficient use of resources.

To provide for the evaluation of the effects of such facilities on land, water, air resources and on public health and welfare.

The intent of this legislation is to identify and resolve issues associated with the siting or location of large-scale thermal electrical generating facilities being planned and built in Minnesota. When the Power Plant Siting Act was enacted, renewable energy was not a significant factor in meeting the state's electrical energy needs.

The known impacts of wind energy facilities are significantly different than those associated with thermal electrical power plants. For example, wind turbine facilities do not affect air and water quality, nor do they require fuel, unit trains, ash ponds or other items commonly associated with large thermal power plants. Because of these and other differences, it not reasonable or practical to apply the existing power plant siting review process and siting criteria to proposed wind energy facilities that meet the existing 50 MW siting threshold of the act.

Furthermore, Minnesota Statute 216B.243, Subdivision 3a. [Use of renewable resources] (1992) makes renewable energy the option of first choice for providing new electric capacity in the state, and puts the burden on utilities to show that renewable energy facilities would not be in the public interest. Because of this requirement, it is not reasonable to site such facilities using a process specifically designed for a large thermal facility.

The task force believes legislation is needed to address wind energy facility issues. This recommendation serves several purposes. First, given the magnitude of wind energy development expected to occur in Minnesota, a regulatory review and permitting process is needed to ensure that such development takes place in an environmentally responsible manner. Second, the regulatory process can address many of the issues associated with wind power, through either the power plant siting process or the environmental review requirements. However, the task force believes a more unified regulatory framework is preferable and can be more expedient, while remaining comprehensive. Third, a regulatory review program specific to wind would be beneficial because a standard or more orderly form of review that can resolve many of the issues associated with wind energy development can benefit the environment and the industry.

Establishment of a regulatory review and permitting process is more desirable than modifying the requirements of the power plant siting process, the environmental review requirements or the critical areas program administered by the EQB to regulate wind energy development in Minnesota.

The task force recommends that the environmental or site review process established for wind energy systems take considerably less time than the existing 12 month siting process but be comprehensive enough to address and resolve problems associated with wind energy facilities. The task force believes that legislation specifying the review of wind energy facilities is preferable to modifying the Power Plant Siting Act.

Charge Items 1b and 1c

At what level of government and at what threshold of committed or anticipated generating capacity in a given geographic area should wind power development be regulated?

For incremental additions of wind generation that fall below the 50 MW threshold of the Power Plant Siting Act, what is the appropriate means (or process) to conduct environmental review and how should cumulative effects be addressed?

Recommendation

The EQB should sponsor legislation to govern wind power development in the 1995 legislative session. Legislation governing wind power should be consistent with other EQB legislative program requirements and should provide for:

- *Orderly development of wind power in Minnesota.*
- *Mandatory state or county permitting of wind energy facilities greater than 5 MW.*
- *Project notification requirements.*
- *Public participation and public information meetings.*
- *Completion of review in less than 180 days.*
- *State development of a model ordinance that could be adopted by counties choosing to establish an environmental and permit review process for wind development.*
- *A state site certification review in the absence of a county permit requirement or model ordinance.*
- *Criteria for evaluating the impact of wind facilities.*
- *Permit conditions.*
- *Permit revocation.*
- *Coordination of projects involving more than one county.*
- *Cost reimbursement to the unit of government issuing the permit for proposed wind energy facilities.*
- *Review of statutory requirements after four years to determine if the need for the law remains.*

RATIONALE AND DISCUSSION

These charge items were difficult to review because wind facilities, depending on the size of the proposed project, may be reviewed either under the EQB's environmental review program or the power plant siting program. However, when the task force considered items 1b and 1c as components of a legislative program that is specific to wind energy facilities, it easily identified the basic requirements of what should be included in legislation governing development of wind power.

The task force's legislative recommendations for wind power are based on many of the basic components and requirements of the EQB's environmental review program, the power plant siting program, the critical areas program and the pipeline routing program.

Charge Item 1 d

Are new rules and/or standards specific to wind power necessary to effectively consider turbine noise levels, turbine density, setbacks, siting on prime farm land or near major migratory flyways, and related environmental issues?

Recommendation

The task force recommends that new rules and standards specific to wind power be adopted to give effect to the legislative recommendations that would regulate wind power development in Minnesota. Some of the issues in this item could be addressed in several different ways, including rules, through development and adoption of a model ordinance or through a state or county permitting process. The task force should address this and other wind issues. There would be no need for the EQB/chair to appoint a new task force because the task force was appointed for a two year term.

RATIONALE AND DISCUSSION

At this time, it is difficult to make specific recommendations on the topics of turbine density, setback requirements, siting on prime farm or other related environmental issues. While the task force has considered these items, not enough information or experience with wind facilities have been attained to know what is reasonable or what will work.

Noise levels associated with the existing wind turbines on Buffalo Ridge meet or fall well below existing PCA noise standards. Since these are receptor standards, turbines would have to be located far enough away from homes to comply. Not known yet is whether

there are public points of proximity or receptors that would experience different impacts due to more than one project operation, such as resonances between sounds from multiple projects, alternating impacts with changes in wind direction, and annoying combination of sounds.

From a visual perspective, the intermixing of turbine designs may result in a unique cumulative impact. Turbine placement on the landscape, turbine array layout, rotational directions, and colors may differ across the projects.

A combined access road would have different effects than separate roads to each project. Consolidation of roads may result in less land removed from current use and less of a visual impact.

Another issue is turbine configuration because it may not be fixed for the life of the project. Tower heights, blade sizes, colors, nacelle (turbine housing) shapes and tower designs also may be altered over time to make the project more economical or efficient, to implement the results of avian mortality research or to repair or upgrade defective and worn components. Blades are likely to be changed several times during the life of the project, for example, and each new set is likely to incorporate technical improvements and thus differ from the previous set. Developers will want some latitude to make incremental changes without violating the original permit or having to obtain a new permit.

Changing turbine locations and configurations after the project is built is an issue that should be addressed as a permit condition. The question is, how much and what type of change is allowed without a reassessment by the permitting authority?

Turbine density, turbine setbacks, and siting on prime farm land are examples of topics that may be addressed by a site certification review process, model ordinance requirements, or environmental permit conditions.

Avian mortality must be addressed by any regulatory review requirements for wind farm facilities. The American Wind Energy Association has submitted a proposal to conduct an "avian population analysis for wind power generation regions" in Minnesota to the Legislative Commission on Minnesota's Resources for funding.

Under the siting requirements of the power plant siting program or the environmental review program, the issue of avian mortality topic would be addressed on a case-by-case basis. For NSP's Buffalo Ridge project, there will be an avian research program to monitor the severity of avian mortality. As more is learned about this issue, possible mitigation measures may be identified.

Charge Item 1 e

How should the Minnesota Environmental Quality Board address the issue of critical area designation for all wind resources?

Recommendation

The critical areas planning process should not be applied or used as a planning and management method of regulating wind energy development in Minnesota.

DISCUSSION AND RATIONALE

The Wind Power Task Force considered and evaluated the critical areas designation and planning process program as a way to address the issues associated with wind power development in Minnesota. However, the task force found that the requirements associated with critical area program would not necessarily provide for orderly development, timely review and flexibility in development of wind power facilities. Orderly and effective development of wind power in Minnesota can best be addressed by a process that is specific to wind, as described under items 1 a, 1 b, and 1 c of the task force report recommendations.

To be designated a critical area, an area must satisfy four criteria:

1. The area must be of significant regional or statewide public interest.

Buffalo Ridge, which encompasses portions of Lincoln and Pipestone counties in southwestern Minnesota, has been identified as the state's best wind resource area. Wind resource maps usually identify areas by wind class, which is defined by a range of wind power densities at a given height above ground. In general, areas identified as Class 5 and above are regarded as suitable for wind energy production, but improvements in technology may make Class 4 and Class 3 sites feasible in the future.

While development of wind power in the Buffalo Ridge area will take place first on Class 5 wind resource areas, subsequent wind development, as shown in Appendix A, may occur on Class 4 and 3 wind resources, depending on technological advances in wind turbine designs.

Because wind power development will be driven by several factors--technology, cost effectiveness, need for facilities, transmission access--that may change over a relatively short period of time, other areas of the state may become suitable for commercial development of wind power in the future.

The task force finds that Buffalo Ridge satisfies this critical area designation criteria. However, if the economics and technology of wind power improve to the point where other areas of Minnesota become suitable for wind development, what form of review should be required for those areas?

2. Other means of protecting the public interest in the area are not available or effective.

The task force finds that the public interest in the area is and can be addressed by other regulatory methods. For example, at the state level, wind projects of sufficient size--greater than 50 MW--would be subject to the siting requirements of the EQB's power plant siting act. However, as noted elsewhere, the task force recommends that wind farm facilities be exempted from the siting requirements of the power plant siting act and regulated by a process specific to wind farm facilities.

Wind farm facilities are also subject to the EQB's environmental review program requirements. For example, wind farm facilities from 5 to 24 MW are subject to the discretionary environmental assessment worksheet. For facilities from 25 to 49 MW, an EAW is mandatory and the EQB is the responsible governmental unit. If the EQB finds the potential for significant environmental effects, it can order preparation of an environmental impact statement. In addition to the existing environmental review requirements, permits may also be required from other state agencies.

At the county levels wind farm facilities in nearly all cases would need to obtain a special use permit. In most cases, this is the only county permit required.

Depending on the specific location or size of a proposed wind farm facility, some other forms of state review or permits may be required.

Regulations are in place that govern review of wind farm facilities at the state level. Statutory and regulatory changes are necessary to facilitate review of wind power facilities, but the critical areas program would not be the best way to regulate wind power in Minnesota.

3. The area is one of a limited number in the state or region.

Although portions of Buffalo Ridge represents Minnesota's best wind resource area, as wind turbine design improves, it may be more cost-effective to locate wind farm in other parts of the state, depending on specific utility needs for power and transmission access.

4. The area must be described specifically by legal description.

The Buffalo Ridge area can be described specifically by legal description.

Charge Item 1 f

How should the possible need for additional transmission and distribution lines, substations and backup generation be considered in a regulatory process?

Recommendation

The task force recognizes that the need for additional transmission line facilities will have to be examined by the PUC either through the integrated resource planning process or the certificate of need process if a project meets the need threshold established in statute.

The task force finds that the statutory requirement for the certificate of need requirement should be examined by the PUC. The PUC certificate of need requirement should also be examined for facilities that are approved through the integrated resource planning process.

RATIONALE AND DISCUSSION

The continued development of wind power along Buffalo Ridge will require additional transmission capacity sometime after NSP installs 100 MW of wind energy facilities. Development of wind energy facilities by independent power producers that do not provide power to NSP could also affect the timing of new transmission capacity. Transmission line facilities of certain length and voltage would be regulated by the PUC's certificate of need requirements and the EQB's transmission line routing process as described below.

PUC Requirements for High Voltage Transmission Lines

The need for additional transmission and distribution facilities associated with wind power development and back up power facilities, such as natural gas turbines, are examined in a utility's integrated resource planning process which must be approved by the PUC.

A utility must obtain a certificate of need from the PUC for any high voltage transmission line longer that 50 miles if the voltage is 200 kV or greater but only 25 miles if voltage is 300 kV or greater. An environmental report would also be required as part of the certificate of need process. Transmission facilities below 200 kV do not require a certificate of need.

EQB Requirements for High Voltage Transmission Lines

The routing of any high voltage transmission lines and associated facilities (greater than 200 kV) will be subject to the requirements of the transmission line routing process, which is governed by the power plant siting Act and the environmental impact assessment, which is an alternative form of environmental review approved for transmission lines by the EQB. The EIA meets the requirements of the environmental review program.

EQB Requirements for Transmission Lines (Less Than 200 kV)

For transmission line facilities from 70 to 199 kilovolts, and at least 20 miles of length at a new location, an environmental assessment worksheet is mandatory, with the EQB as the responsible governmental unit. Discretionary EAWs may be done on projects less than 20 miles in length. Environmental review under the EQB's environmental review rules is not considered a permit. However, it must be completed before any required permit is issued or construction begins.

Transmission facilities of less than 70 kV are exempted, and no state level environmental review is required.

ADDENDUM

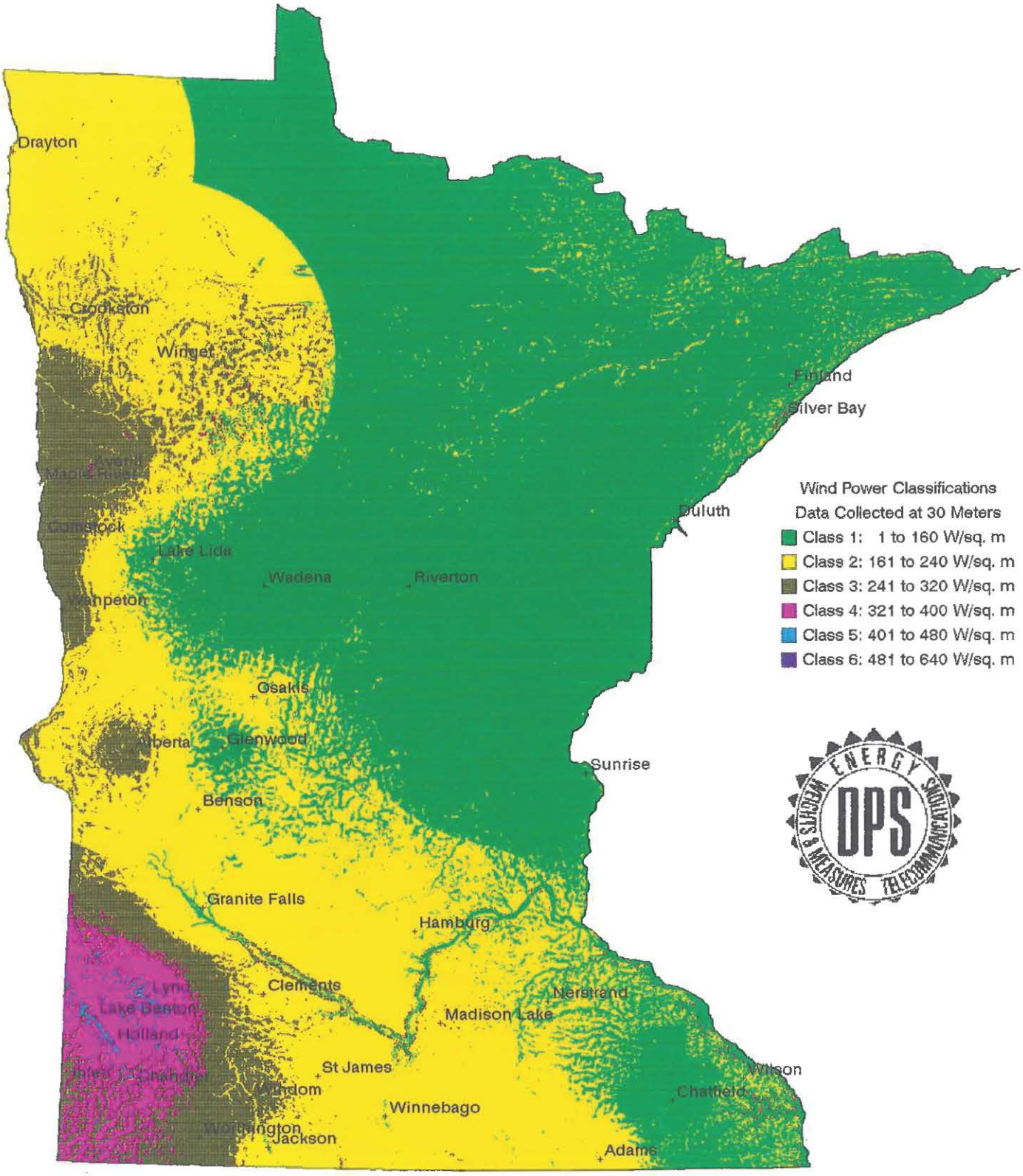
The 1993 Power Plant Siting Task Force on Wind Power in Minnesota considers the following topics to be significant with respect to continued development of wind power in Minnesota. However, the task force is not offering any recommendations on these topics because they are outside the scope of the charge given by the EQB. The task force believes that these topics need to be resolved to insure orderly development of wind power in Minnesota.

- Property rights and compensation
- Property tax on wind energy facilities
- Impact of dispersed wind generation and small versus large wind energy developments
- Certification of wind turbine facilities
- Buffer setbacks for wind energy developments

APPENDICES

Appendix A

Wind Power By Class



Source: Modified MN Wind Resource Assessment Program Data (1984-1993)

May 1994

July 7, 1994

MEMBER LIST
Environmental Quality Board - Power Plant Siting
Task Force on Wind Power in Minnesota

Elliot Bayly
World Power Technologies
1302 West 5th Street
Duluth, MN 55806
Tel: 218-722-1492 (w)

Bruce Drew
Drew Consulting Services
4425 Abbot Avenue South
Minneapolis, MN 55410
Tel: 612-927-5087 (w/h)

Janet F. Gonzalez
MN Public Utilities Commission
111 East Kellogg Boulevard, #2H
St. Paul, MN 55101
Tel: 612-296-1336 (w)

William Grant*
Izaak Walton League of America
475 Glenwood Avenue
Roseville, MN 55113
Tel: 612-922-1608 (w)

Carl Hauschild
Lincoln County Commissioner
Route 1, Box 183
Minneota, MN 56264-9801
Tel: 507-694-1517 (w/h)

Jerry Holien
Yellow Medicine Planning & Zoning
P.O. Box 675
Clarkfield, MN 56223
Tel: 612-669-7524 (w)

Mark Jacobs, Regional Director
MN Pollution Control Agency
700 North 7th Street
Marshall, MN 56258
Tel: 507-537-7132 (w)

David F. Johnson
Buffalo Ridge Area Farmer
RR 1, Box 59
Verdi, MN 56179
Tel: 507-368-4316

Dean Johnson
Resource Strategies Inc.
2700 Oakland Road
Minnetonka, MN 55305
Tel: 612-942-8010 (w)

Dan Juhl
New World Power Corp.
191 West 5th Street
Cottonwood, MN 56229
Tel: 507-532-4502 (w)

Allen Krug
MN Department of Public Service
4095 Parkways Ponds Lane
White Bear Lake, MN 55110
Tel: 612-296-7132 (w)

Donald Nelson
MN Dept. of Natural Resources
P.O. Box 756
New Ulm, MN 56073
Tel: 507-359-6073 (w)

Michael Noble
Sustainable Resource Center
1841 Goodrich Avenue
St. Paul, MN 55105
Tel: 612-872-3282 (w)

John Oughton
Blue Oak Environmental Planning
1245 Jefferson
St. Paul, MN 55105
Tel: 612-699-3124 (w/h)

Judy M. Poferl
MN Department of Public Service
18265 East 200th Street
Welch, MN 55089
Tel: 612-296-0407 (w)

Robert Schulze
Buffalo Ridge Area Farmer
RR 1, Box 131
Holland, MN 56139
Tel: 507-347-3380 (w/h)

Alan Steinhoff
RTR Public Schools
Route 1, Box 82
Pipestone, MN 56164-9719

Leroy Stensgaard
Pipestone County Commissioner
Box 118
Ruthon, MN 56170
Tel: 507-658-3681 (w/h)

Senator Jim Vickerman
Minnesota State Senate
R.R. 2, Box 135
Tracy, MN 56175
Tel: 507-629-4878 (w/h)

STAFF
Larry Hartman
MN Environmental Quality Board
300 Centennial Building
658 Cedar Street
St. Paul, MN 55155
Tel: 612-296-5089 (w)

** Task Force Chair*