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March 20, 2002

Governor Mike Johanns
Office of the Governor
PO Box 94848
Lincoln, NE 68509-4848

Dear Governor Johanns:

Last April you asked the Nebraska Power Association (NPA) to prepare a business plan outlining all aspects of developing, financing, owning and operating wind power assets predicated on the primary premise of selling a significant portion of the wind-generated electricity outside of Nebraska. On behalf of the Nebraska Power Association Board of Directors, please find enclosed the NPA Wind Energy Business Plan Report.

While there is significant wind energy potential in several areas of the state, the economic and transmission considerations do not support a positive business plan for large scale wind energy development by Nebraska's publicly owned utilities at this time. There does not appear to be a market for exporting the energy as significant wind energy projects are being developed in several states in this region. Existing transmission constraints limit the ability for a large scale Nebraska wind energy project to deliver energy into non-Nebraska markets without incurring significant costs. This puts Nebraska at a competitive disadvantage for marketing wind energy to other states in this region. Nebraska utilities have a strong interest in renewable energy. However, until the economics improve further, that interest will be pursued through smaller scale, customer-supported wind and landfill gas projects.

As you requested, we sent the draft report to the Nebraska Wind Energy Task Force for review and comment. Their response is enclosed. The NPA Board discussed their comments and respond to their primary six points as follows:

1) *The original premise - wind energy for export - is too narrow. Any plan needs to first focus on the in-state energy supply plans and wind energy's impact on rates.*
We believe the plan prepared by the NPA is responsive to the scope and that the scope was appropriate. Individual NPA members evaluate the economics and needs of their own customers, including the evaluation of wind energy impact on rates. Evaluating the market

for export in order to provide benefits to the state was not something that had been previously studied. The cost and market analysis indicates that wind is not an economically competitive resource for export at this time.

2) *The plan needs additional in-state marketing analysis, including Deliberative Polling of Nebraska energy consumers.*

This was a study of economics. Polling may identify the opinions of those polled, but opinions do not change economics and would not cause the conclusions of the report to be changed. Several Nebraska utilities have already implemented the most deliberative form of polling energy consumers by asking customers to pay additional amounts in the electric bill to fund the incremental cost of renewable energy programs.

3) *The plan needs to incorporate options that will allow application of the Production Tax Credit for public power.*

The production tax credit is a guaranteed federal tax credit that is available to investor-owned utilities, not public power entities. A production tax credit for public power does not exist today. NPA did consider the Renewable Energy Program Incentive (REPI) credit. The REPI program does have less certainty than the production tax credit because REPI is subject to annual appropriations from Congress. A tradeable tax credit that would allow public power utilities to transfer the production tax credit to its customers or other taxpayers is being discussed as part of the national energy legislation. We do recognize that if the amount of tax relief or incentive credit changes that the economics of the study can change. If tax or credit changes are made which improve the economics for wind, then NPA can update that information in the study and determine if the conclusions would change.

4) *The plan should incorporate information on cost, risk, and reliability of wind energy compared to conventional power plants, including combining wind energy with a combustion turbine.*

The cost, risk, and reliability of wind and a review of the regional market for wind were a part of this study in order to look at the economics of wind. Direct comparisons of the characteristics of wind and other types of dispatchable resources are difficult because they are so different. Since this was a comparison of expected wind costs to the market, the additional discussion and comparisons to traditional resources would not have added value or changed the results of the study.

5) *The plan should identify and recommend any necessary legislative action if required to implement the plan.*

The NPA study did identify various structures for a public wind energy merchant company. We noted that the non-profit foundation structure offered the best ability to meet a goal of

transferring profits to the state for economic development. The report estimated that $500,000 in seed capital would be required to pursue the legislative and legal matters necessary to get authority to build wind generation under the foundation structure.

Considering that the report does not show it is economically feasible to build merchant wind generation in Nebraska at this time, we saw no reason to develop and include specific legislative fixes.

6) *The Nebraska Wind Energy Task Force would like to work directly with representatives from the NPA Board of Directors to develop the next draft of the plan.*
The NWETF comments did not identify any flaws with the assumptions or economics in the plan that would change the outcome; therefore NPA has finalized the report as contained in the review draft.

It is understandable that many on the NWETF are disappointed that the study does not recommend moving forward with a large scale wind project for export at this time. NPA members are supporters of renewable technologies. Many of the state's utilities have already made voluntary investments in wind and are installing other renewable technologies like landfill gas. NPA expects that the economics of wind will continue to improve and expects that when it is truly an economic option that larger scale developments will be built. To proceed before that time however places an undue burden on the state's electric consumers and reduces the competitive advantage that Nebraska has in the area of electric energy costs.

Governor, we would welcome the opportunity to visit with you about the report and answer any questions you may have about the results.

Sincerely,

Terry L. Bundy
President
Nebraska Power Association

TLB

Enclosure

Governor's Report

On

Potential for Merchant Wind Energy In Nebraska

Prepared and Presented By

Nebraska Power Association

February 2002

Potential for Merchant Wind Energy in Nebraska

Report of the Nebraska Power Association
To Governor Mike Johanns

February 2002

In September of 2000 at a Wind Energy conference, Nebraska Governor Mike Johanns posed several questions regarding the potential for development of Nebraska's wind resources. This request resulted in the formation of an informal group called the Nebraska Wind Energy Task Force. This task force represented a broad group of stakeholders, including public utilities, state government, farmers and ranchers, landowners, environmentalists, consumers, and private industry. A report from this task force was delivered to Governor Johanns on January 25, 2001. The primary recommendation of the Wind Energy Task Force report was for the Governor to establish a steering committee to work closely with the Nebraska Power Association to devise a wind development plan for Nebraska. The Governor has not done so and NPA believes appropriately to await the outcome of the NPA study of wind power potential.

In April, Governor Johanns asked the Nebraska Power Association (NPA) to prepare a business plan detailing how the state could develop its wind power assets and sell most of the electricity outside of the state. On April 23rd, the Board of Directors of NPA approved going forward with the studies necessary to address the essential elements of a plan as set forth in the Governor's letter. Members of NPA formed a Project Team to study all relevant aspects of wind power in Nebraska necessary to prepare such a business plan.

This report summarizes the results of the studies and presents an overview of the potential for the creation of a public entity in Nebraska to undertake an entrepreneurial enterprise as necessary to achieve the goals set forth in the Governor's request.

1. Objective

The objective of the NPA effort was to prepare by the fall of 2001 a business case of the engineering, economic, and financial feasibility of a newly created public entity in Nebraska to plan, develop, finance, operate, and market the output of one or more major wind farms strategically located in Nebraska. The business case was to include analysis of the following specific items:

(1) an assessment of the market demand for large amounts of wind generated energy in states surrounding Nebraska,
(2) an assessment of potential sites in Nebraska,
(3) an estimate of the cost of construction of wind generation facilities,
(4) an estimate of the cost of ownership, operation and maintenance of wind facilities on large wind farms in Nebraska,
(5) an organizational structure that will allow a public entity in Nebraska to do all that is necessary to accomplish a successful development, and

(6) a plan to finance the cost of acquisition and construction of one or more large wind farms under the selected structure.

2. Wind Energy Overview

The development of wind energy as a "central station" source of electric generation has seen dramatic growth in recent years as a result of technological advances, legislated wind energy mandates, renewable energy incentives and growing consumer interests in renewable energy. Technological advances have improved wind turbine efficiency and reliability and have extended wind turbine life expectancy. Mass production to meet the increased demand has lowered the cost of manufacturing wind turbines. Since wind energy does not require fuel for combustion and has no associated emissions or solid wastes subject to regulations, its costs are considered stable over the life of the turbine, barring public policy changes intended to tax energy output.

Current costs for wind energy from sites considered a good wind resource (Class 5 or better) with reasonable transmission access are higher on average than existing fossil fired generation. Nevertheless, current Federal subsidies for public utilities building wind generating facilities bring wind energy busbar costs into a competitive range with all-in-busbar costs of new fossil fired generation. It should be noted however that the overall value of wind energy is less than that generated by conventional central station generators for the reasons as set forth in the succeeding paragraph.

Wind generated energy is intermittent since it is only available when the wind speed at the turbine exceeds eight miles per hour. Fluctuations in consumer demand and fluctuations in wind speed result in the need for other dispatchable central station generation resources that can vary generation to the degree necessary to instantaneously match generation output to energy consumed by all customers at any time. Since electricity is consumed at all times and cannot be stored to any great extent, wind energy can only be a small portion of the generation resource mix necessary to provide consumers energy as required. One factor to consider when evaluating wind generation as a central station source is that in our region, not more than 15 to 18 percent of a wind turbine's nameplate capacity can be counted upon for reliability purposes thus significantly discounting wind's contribution to capacity.

The intermittent nature of wind energy impacts transmission systems as well. Wind can serve as a 'load reducer' in areas where wind energy is consumed locally. Typically though, central station wind energy sources as large as are being contemplated in this report must be transmitted to loads substantial distance from the wind energy site. Therefore, wind energy development must include arrangements for long term transmission rights to deliver output to a remote load center. One value of wind energy generating facilities in remote areas is their capability to occasionally and unpredictably provide voltage support to the transmission system.

The intermittent nature of wind also impacts scheduling of production of energy within an electric system's load frequency control area. Limited predictability of wind speed makes it difficult to schedule power from wind even on an hourly basis. Therefore, generation and transmission control centers must make special accommodations for wind energy in order to include it while providing overall reliable power to consumers in the control area.

Despite the technical hurdles which must be considered, wind energy can also have a positive impact on local economies. Not only is there the immediate, short-term economic boost associated with construction, wind energy siting leases can provide annual revenue to landowners while having little impact on the existing use of the land with careful location of the individual turbine assemblies.

Based on the positive factors discussed above, six Nebraska utilities created the Nebraska Distributed Wind Generation Project consisting of two 750 kW turbines located about 1.5 miles west of the town of Springview on leased grazing land in Keya Paha County. The two units were connected to the electric distribution system of the KBR Rural Public Power District. The turbines were installed and energized in October 1998, and were released for full-time operation in late January 1999. Lessons learned from the construction and operation of this facility were utilized in the preparation of the studies supporting this report. In addition, the wind turbine assemblies installed and operated by Lincoln Electric System (LES) provided useful information to the NPA Study.

3. Issues to Consider

The Governor's request for a business case supporting a decision to create a public entity to produce wind energy for sale and delivery to load centers outside of Nebraska has many business elements and facility components that must be addressed.

First, there are the organizational and legal questions that arise when creating a public entity formed in Nebraska with authority to finance, build, own and operate wind generators in Nebraska for the purpose of selling and delivering the output to entities who distribute electricity to load centers located in States other than Nebraska. Statutory as well as income tax issues must be considered before going through the expense of locating, financing and constructing substantial numbers of wind turbine assemblies in the suitable parts of Nebraska.

Second, collecting the electric output of some 270 wind turbine assemblies scattered over several square miles of land in suitable locations for delivery into the regional transmission system poses a particular problem for those rural distribution utilities whose right to condemn property and build such distribution and transmission facilities is limited under law to the purpose of providing electric service to customers in their respective certified service territories.

Third, The electrical output from the wind turbines must be marketed and sold to entities outside of Nebraska who, for whatever reason, are seeking a large supply of wind energy for delivery to electric customers within their load centers. There is a risk element to wind energy development that can't be ignored, if it is to be done on an entrepreneurial basis as a public venture. There will be marketing groundwork and sales efforts, legislative effort and tax opinions to be obtained before any significant developmental work can get underway in Nebraska. That means that a public entity will be putting rate payer dollars at risk, without assurance of cost recovery.

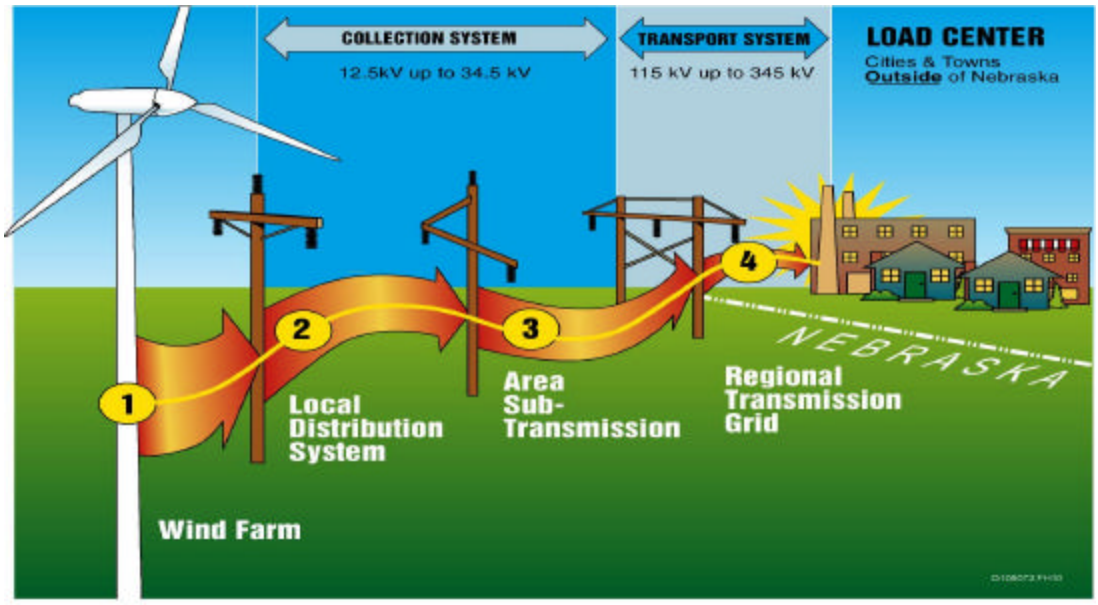


Figure 1 above provides a pictorial representation of the number of electric systems and entities that would become involved in a wind energy development program as contemplated in the Governor's request.

4. Potential Sites

In March of 1994, the Nebraska Legislature's Natural Resources Committee, the Nebraska Power Association (NPA), and the Nebraska Energy Office (NEO) reached an agreement to complete a statewide wind monitoring study. The purpose of the study was to identify and quantify the wind resource at locations within the state with potential for wind development. Global Energy Concepts (GEC) was awarded the work through a competitive bid process and signed a contract in September 1994. Data collection at eight sites began in April 1995 and continued through March 1999, resulting in four consecutive years of wind resource data.

The eight sites monitored included Imperial (Chase County), Rushville (Sheridan County), Winnebago (Thurston County), Wahoo (Saunders County), Kimball (Kimball County), Valentine (Cherry County), Springview (Keya Paha County), and Stuart (Holt County). The selection of these sites was the result of a screening process based on estimates of the wind resource, distance to transmission lines, sufficient land area for utility-scale project development, and exposure of local terrain features to the prevailing wind directions. The possible sites were then ranked for consideration based on landowner interest, suitability for development, environmental and public acceptance issues, and site access. Detailed Site Evaluation Reports are provided in Appendix C.

Over the four-year study period, the annual average wind speeds at the 40-meter level ranged from 13.9 to 16.8 mph at the eight monitoring sites. Based on wind power density, the sites are rated as Class 3, 4, and 5 wind sites. Class 3 is generally considered to be the minimum rating at which wind power development is technically viable. The highest average annual wind speeds were recorded at Imperial and

Valentine, while the lowest speeds were recorded at Rushville and Wahoo. The wind speeds were also analyzed for seasonal patterns, which were observed to be similar across the state. The winds are highest during the fall and winter, decrease during the spring, and are lowest in the summer months of July and August. Operating results of the two wind projects in Nebraska (4 turbine assemblies) have continued this predicted performance. Finally, wind speeds at all eight sites decrease slightly in the early morning and evening hours.

For this current study, the Project Team reviewed and considered the findings of the Nebraska Wind Energy Site Data study completed by GEC still viable. The sites, with associated wind speeds and wind class, are included below.

SITE	Wind Speed (mph)	**Wind Class**
106: Valentine	16.4	5
101: Imperial	16.3	5
107: Springview	16.0	5
108: Stuart	15.8	4
105: Kimball	15.4	4
103: Winnebago	15.2	4
102: Rushville	14.6	3
104: Wahoo	14.4	3

In addition to the availability of wind data, other considerations for selecting a site include proximity to and capabilities of the distribution and communication systems, adequate transmission capability, minimal environmental impact, compatible land use, ease of access, a cooperative distribution system owner, and the local public's interest in wind energy. The transmission concerns for five of the sites were identified in the study and summarized hereinafter. Permitting and environmental issues were also studied and will be summarized also. Once a decision is made for the general location of the project, additional work needs to be conducted to identify and evaluate specific land parcels in the vicinity.

5. Electrical Transmission to Remote Load Centers

In addition to the local distribution and area sub transmission systems that may have to be improved to collect the output of the large wind farms, the wind energy will have to be transported over the regional high voltage transmission grid from Nebraska to the load centers of the utilities in areas remote from Nebraska who purchase the output.

Load flow studies were performed of the regional high voltage transmission system to determine what improvements would be necessary to receive the output of both a 50 MW and a 200MW wind farm at various locations in Nebraska and transmit it to remote load centers out of Nebraska.

The studies were made at two levels, first to address the impacts of various new proposed wind sites upon the regional transmission system and second to identify transmission constraints that would limit the full capability of the proposed new wind

power resource(s). If transmission constraints were evident from the studies, second iterations were performed to identify proposed fixes and approximate costs. This screening analysis was intended to provide a high level summary of transmission system impacts and is not considered a detailed analysis of the specific sites to be selected eventually.

To model the collection system for delivery of wind turbine output to the transmission system, certain baseline assumptions were developed and utilized for all five wind turbine sites studied. A 34.5 kV collector system was assumed which would aggregate all of the individual wind turbine generation into one interconnection voltage. A 115/34.5 kV step-up transformer was modeled to provide a transformation to the Nebraska Public Power District (NPPD) 115 kV transmission voltage. Ten miles of 115 kV line construction was assumed to address the required transmission line additions to tie into the nearest 115 kV switching station. Each of the wind site development options utilized the same interconnection modeling assumptions in the screening analysis.

The results of the Loadflow Screening Analysis focused on the Nebraska area transmission system and the impacts on existing facilities. Results are obtained for each individual size option and site.

Option W1: Wind Farm near Ainsworth

The development of a 50 MW wind farm near Ainsworth would not involve substantial transmission facility additions. The overloaded equipment impacted by the 50 MW incremental addition is primarily substation facilities. The impacts to regional constrained paths would require either facility upgrades or mitigating transactions. An estimated $6 Million investment in transmission facilities would be required to accommodate a 50 MW wind farm near Ainsworth. This assumes that the wind farm is within 10 miles of the existing Ainsworth 115 kV substation. If the site development is further away from existing transmission facilities, then the estimated interconnection costs will be greater.

The development of a 200 MW wind farm near Ainsworth would require substantial transmission facility additions. The existing 115 kV transmission lines from Ainsworth – O'Neill – Neligh would need to be re-conductored and/or rebuilt. There are also additional substation facilities that would need to be replaced and the impacts to regional constrained paths are magnified. The estimated cost to accommodate a 200 MW wind farm near Ainsworth is $26 Million.

Option W2: Wind Farm near Imperial

The development of a 50 MW wind farm near Imperial would not involve substantial transmission facility additions. The overloaded equipment impacted by the 50 MW incremental addition is primarily substation facilities. The impacts to regional constrained paths would also require either facility upgrades or mitigating transactions. This location is within the Gerald Gentleman Station (GGS) Stability Interface, which would require additional detailed stability analysis to address the impacts of this facility on present operational stability limitations. For this screening analysis, it was assumed that this wind farm would be integrated into the existing GGS Remedial Action Scheme and tripped off-line during any critical disturbance. An estimated $8 Million investment in

transmission, substation and communication facilities would be required to accommodate a 50 MW wind farm near Imperial.

The development of a 200 MW wind farm near Imperial would require substantial transmission facility additions. The existing 115 kV transmission lines from Grant to Beverly would need to be re-conductored and/or rebuilt. There are also additional substation facilities that would need to be replaced and the impacts to regional constrained paths are magnified. The impacts on the GGS Stability Interface and the Western Nebraska – Western Kansas Interface are also concerns that have not been completely addressed in this screening analysis. The estimated cost to accommodate a 200 MW wind farm near Imperial is $30 Million.

Option W3: Wind Farm near Rushville

The development of a 50 MW wind farm near Rushville would not involve substantial transmission facility additions. The overloaded equipment impacted by the 50 MW incremental addition is primarily substation facilities. The impacts to regional constrained paths would also require either facility upgrades or mitigating transactions. This location is within the GGS Stability Interface and Laramie River Station Stability Interface, which would require additional detailed stability analysis to address the impacts of this facility on present operational stability limitations. For this screening analysis, it is assumed that this wind farm would be integrated into the existing GGS Remedial Action Scheme and tripped off-line during any critical disturbance. An estimated $8 Million investment in transmission, substation and communication facilities would be required to accommodate a 50 MW wind farm near Rushville.

The development of a 200 MW wind farm near Rushville would require substantial transmission facility additions. The existing 115 kV transmission lines from Chadron – Rushville – Gordon - Shannon would need to be re-conductored and/or rebuilt. There are also additional substation facilities that would need to be replaced and the impacts to regional constrained paths are magnified. The impacts on the GGS Stability Interface and the Laramie River Station Stability Operating Guide are also concerns not addressed in this screening analysis. The estimated cost to accommodate a 200 MW wind farm near Rushville is $37 Million.

Option W4: Wind Farm near Emerson

The development of a 50 MW wind farm near Emerson would not involve substantial transmission facility additions. The overloaded equipment impacted by the 50 MW incremental addition is primarily substation facilities. The impacts to regional constrained paths would require either facility upgrades or mitigating transactions. An estimated $6 Million investment in transmission facilities would be required to accommodate a 50 MW wind farm near Emerson. This assumes that the wind farm is within 10 miles of the existing Emerson 115 kV substation. If the site development is further away from existing transmission facilities, then the estimated interconnection costs will be greater.

The development of a 200 MW wind farm near Emerson would require substantial transmission facility additions. The existing 115 kV transmission lines from Twin Church – Emerson – Bancroft - Oakland would need to be re-conductored and/or rebuilt. There are also additional substation facilities that would need to be replaced and the impacts to

regional constrained paths are magnified. The impacts to Ft.Calhoun South are significant and facility contributions in the Omaha Public Power District (OPPD) system would be required to accommodate this resource. The estimated cost to accommodate a 200 MW wind farm near Emerson is $20 Million.

Option W5: Wind Farm near Wahoo

The development of a 50 MW wind farm near Wahoo would not involve substantial transmission facility additions. The overloaded equipment impacted by the 50 MW incremental addition is primarily substation facilities. The impacts to regional constrained paths would require either facility upgrades or mitigating transactions. An estimated $4 Million investment in transmission facilities would be required to accommodate a 50 MW wind farm near Wahoo.

The development of a 200 MW wind farm near Wahoo would require substantial transmission facility additions. The existing 115 kV transmission lines from Columbus East – David City – Wahoo – Davey – 70th & Bluff would need to be re-conductored and/or rebuilt. There are also additional substation facilities that would need to be replaced and the impacts to regional constrained paths are magnified. The estimated cost to accommodate a 200 MW wind farm near Wahoo is $17 Million.

The results of the Regional Constrained Path Analysis indicate the relative impacts of the new wind generation sites on MAPP area constrained interfaces. The 200 MW wind generation exported into the St. Louis, Missouri region would represent a worst-case impact on regional constrained interfaces.

6. Environmental and Permitting Requirements

Several permits and approvals are required to build wind projects. Due to the lack of combustion in the generation of wind energy, air emission and water discharge issues are virtually non-existent. In general, local permits and approvals, especially regarding zoning compliance, become critical path issues. Visual impacts and impacts to local and migratory bird populations are also an important issue to address. The studies identified all of the federal, state and local permits or approvals that are generally required of electric generating facilities, and their applicability to wind energy.

While the list is extensive, the NPA does not believe that permitting, which is a normal process involved for any power resource project, will be a major problem in the development of wind farms in Nebraska. However, the public policy of Nebraska for building generation and transmission facilities in Nebraska is an issue that will need to be addressed.

The Nebraska Power Review Board (NPRB) must authorize the construction of any type of power generation facility in the state of Nebraska, including wind turbine generators, the output of which is sold at either retail or wholesale in Nebraska.

The application for authorization consists of a two-page questionnaire requesting a description of the proposed facility (including the identification of alternative locations and unit types), overall project schedule and total estimated costs. Any engineering

feasibility studies must be submitted. The NPRB examines the application upon filing and holds a public hearing to discuss concerns and to discover any issues from the public or alternative generating sources (such as already functioning power suppliers in the area). The applicant has the opportunity to answer all questions and to resolve all issues of concern from parties contesting the application.

Under the Nebraska Revised Statutes, section 70-1024, the NPRB must find that the project "will serve the public convenience and necessity" before approving any generation or transmission project. There is a serious legal question as to whether generation or transmission facilities sited in Nebraska to serve the export market would meet the "public convenience and necessity" criteria.

Another regulatory process that may have to be addressed for the successful creation of a entrepreneurial public entity in Nebraska, and one which is unfamiliar to public power entities in Nebraska, is a requirement for permission from the Federal Energy Regulatory Commission (FERC) to be an exempt wholesale generator (EWG).

EWGs are a designated class of independent power producers created under the 1992 Energy Policy Act. An EWG is defined as a person or entity determined by FERC to be engaged directly or indirectly and exclusively in the business of owning and/or operating an "eligible" facility and selling energy at wholesale.

7. Legal and Organizational Issues

There are basically six structures under which a public power entity can be formed in Nebraska to undertake this venture. These structures are a public power district, a cooperative (either non-profit or for profit), an inter-local agreement, a joint action agency, or a limited liability company. These traditional structures are believed to have substantial legal limitations on transferring funds to the State of Nebraska. Creation of a non-profit foundation to conduct the entrepreneurial affairs of a Nebraska wind energy merchant company may have some possibilities not available in any of the other corporate structures considered such as transfer of excess funds of the state. Each structure was examined extensively in the study.

7.1 Public Power District

A public power district (PPD) is organized under Chapter 70, article 6, of the Nebraska Revised Statutes. As such, it is a public corporation and political subdivision of the state of Nebraska. A district may be composed of the territory of one or more municipalities, whether contiguous or otherwise. It is organized by filing a petition with the NPRB. The petition must define a PPD's operating area and the populace to be represented by the Board of Directors.

Once created, a PPD has the power to borrow money and incur indebtedness for any corporate use. Any indebtedness or obligation is payable solely from revenue or income derived from its operation and management of its electrical system, or from proceeds of the sale of property of the district. A PPD also has the power of eminent domain, whereby it can acquire property useful for the generation, transmission or distribution of electricity.

7.2 Cooperatives

Cooperative, nonprofit, membership corporations may be organized under Chapter 70, article 7 or under Chapter 21, article 13 of the Nebraska Revised Statutes. Most of the state's cooperatives are organized under the general non-profit corporation statutes contained in Chapter 21. However, several are organized under the more restrictive provisions for electric cooperatives contained in Chapter 70.

A cooperative can be formed by 10 or more persons or one or more cooperative companies for the transaction of any lawful business. If the cooperative engages in a business subject to regulation under another law of this state, it may incorporate only if permitted by, and subject to all limitations of, the other laws. Once incorporated, it has the same powers and duties as required of other types of corporations. It can: (1) purchase, lease or acquire real or personal property, (2) sell, mortgage or dispose of all or any part of its property and assets, (3) make contracts and guarantees and incur liabilities, and (4) make and alter operating agreements. It can also make donations for the public welfare or for charitable, scientific, or educational purposes. It may be either for-profit or a non-profit organization.

The business and affairs of the cooperative are managed under the direction of a board of directors in accordance with written by-laws. These directors are elected annually, or as otherwise provided in the by-laws, by the members. The qualifications for directors are prescribed in the articles of incorporation or the by-laws.

7.3 Interlocal Agreement

Chapter 13, article 8 of the Nebraska Revised Statutes governs the creation of a joint entity pursuant to an interlocal agreement. Under these statutes, any two or more public agencies may enter into agreements with one another for joint or cooperative action pursuant to the Interlocal Cooperation Act. Once created, an interlocal constitutes a separate public body corporate and politic of the state of Nebraska, capable of exercising public powers and acting on the behalf of the public agencies which are parties to such agreement. An entity created by local public agencies pursuant to the Interlocal Cooperation Act is not considered to be a state agency.

An administrator or joint board governs an entity created under an Interlocal agreement. In the case of a joint board, the public agencies creating the joint entity must be represented. If any provision of services or facilities fall under state governmental control, the Interlocal agreement must be submitted to the agency having such power of control to be approved or disapproved.

Any powers, privileges, or authority capable of exercise by a public agency of this state may be exercised and enjoyed jointly with any other public agency of this or any other state. Its only limitations are the limitations of the participating agencies and the terms of the agreement.

7.4 Joint Public Agency

A Joint Public Agency is organized under Chapter 13, article 25 of the Nebraska Revised Statutes, to permit local governmental units to make the most efficient use of the powers by allowing them to cooperate with other governmental units. The participating parties create this joint entity under the Joint Public Agency Act through a resolution, ordinance, or appropriate action.

7.5 Limited Liability Company

A Limited Liability Company (LLC) is organized pursuant to Chapter 21, article 26 of the Nebraska Revised Statutes, for any lawful purpose other than being a financial institution. The words "limited liability company" or the abbreviation LLC must be the last words of the name of the company. A LLC is formed by two or more persons executing and delivering articles of organization in duplicate to the Secretary of State.

Once created a LLC has most of the powers granted to a corporation in Nebraska. It can: (1) purchase, lease or acquire real or personal property, (2) sell, mortgage or dispose of all or any part of its property and assets, (3) make contracts and guarantees and incur liabilities, (4) make and alter operating agreements, and (5) cease its activities and surrender its certificate of organization. A LLC can also become a member of a general partnership, limited partnership, joint venture or similar association, or other limited liability company.

7.6 Non-Profit Foundation

Non-profit foundations or corporations are organized under Chapter 21, article 19 of the Nebraska Revised Statutes and under section 501(c)(3) or section 509(a) of the Internal Revenue Code, for the purpose of engaging in any lawful activity unless a more limited purpose is set forth in the articles of incorporation. If the corporation intends to engage in an activity that is subject to regulation under another statute, it may proceed only if incorporation under the act is not prohibited by the other statute. The corporation is subject to all limitations of the other statute.

One or more individuals or entities may create a corporation by delivering articles of incorporation to the Secretary of State for filing. The articles of incorporation should include, among other things, the purpose for which the corporation is organized, the name of each incorporator; whether or not the corporation will have members; and provisions not inconsistent with law regarding the distribution of assets on dissolution.

Each corporation must have a board of directors. All corporate powers are exercised by or under the authority of, and the affairs of the corporation managed under the direction of its board. Also, unless otherwise provided in the articles or bylaws, a corporation shall have a president, a secretary, a treasurer, and such other officers as are appointed by the board.

Unless its articles of incorporation provide otherwise, every non-profit corporation has perpetual duration and succession in its corporate name and has the same powers as an individual to do all things necessary or convenient to carry out its affairs. It can: (1) purchase, lease or acquire real or personal property, (2) sell, mortgage or dispose of all or any part of its property and assets, (3) make contracts and guarantees and incur

liabilities, (4) make and alter operating agreements, and (5) cease its activities and surrender its certificate of organization.

The NPA believes that a non-profit foundation for corporate structure offers the best possibilities of accomplishing most of the goals that the governor envisions with a entrepreneurial public entity capable of becoming a merchant wind generator and transferring the profits of such an enterprise over to the state for economic development purposes.

8. Market Potential for Wind Energy Sales

To determine the market potential for exporting substantial portions of the output of a large wind farm in Nebraska, the NPA Board hired the national consulting firm R.W. Beck (See Appendix A for copy of their report). The following is a summary of the results of their study.

The general public has viewed environmentally friendly forms of electric generation favorably for many years, but until recently the cost associated with many renewable technologies was prohibitively high. Advancements in wind power technology in the U.S. and abroad have led to substantial decreases in the cost of wind energy over the past decade. This, coupled with record high and widely fluctuating natural gas prices and capacity shortages that have resulted in wholesale price spikes, have caused resurgence in the development of renewable generation, including wind, as the economic cost of these resources compared to traditional resources has narrowed.

Demand for renewable generation capacity originates from the marketing activities of utility and energy service providers as well as from regulatory or legislatively mandated utility programs. Under green marketing or green pricing programs end-use customers frequently purchase renewable energy at a premium price. But due to a variety of factors, only about one percent of customers has subscribed to green pricing programs, indicating it is still a niche product. According to the U.S. Department of Energy (DOE), 75 megawatts (MW) of renewable energy had been built in the U.S. in response to green pricing programs as of December 2000. At that time an additional 205-MW of capacity were planned.

Some states have mandated Renewable Portfolio Standards (RPS) as part of their deregulation initiatives, while other states, through legislative or regulatory initiatives, have issued directives to the investor owned utilities to increase renewable requirements regardless of industry restructuring. Demand for wind energy created by state mandate or through a utility's resource planning process is less likely to command a price premium, as it must compete with other technologies.

8.1 Mandated Renewable Portfolios Standards

In most of the states covered in the R. W. Beck study, legislators and utility commissions have not addressed renewable energy development. Across the country, states that have moved forward with deregulation have often dealt with renewable resource issues as part of their regulatory or legislative restructuring agenda.

Only four states under investigation - Colorado, Wyoming, Minnesota, and Iowa - have utility-scale wind projects totaling over 20-MW of capacity. Minnesota and Iowa are the only two states that also have (RPS) mandated for their investor owned utilities, and these two states have progressed the farthest in developing their wind potential.

The other state of interest that has utility-scale sizable wind production facilities is Wyoming. There are no renewable or wind energy mandates in Wyoming, and most of wind power generated in that state is being sold into the Pacific Northwest or Colorado.

8.2 Green Power Pricing

Residential participants in utility green pricing programs generally pay $2.50 to $10.00 per month over their normal charges for electric service. Price premiums for energy-based green pricing offerings range from 0.4¢ per kWh to as much as 20.0¢ per kWh for 100 percent new renewable energy content, with a median of 2.5¢ per kWh.

Competitive green power products typically carry a price premium over the regulated cost of service for retail customers of 1.0¢ per kWh to 2.0¢ per kWh. Some marketers are using a fee-based system, where they charge a fixed monthly program fee with the electricity priced at the default market price.

The R.W. Beck study, as well as NPPD's and LES's own green power marketing programs inside of Nebraska leaves NPA with the belief that substantial work remains to be done to determine where wind power will be incorporated into the electric utility resource base, whether mandated or voluntarily. Similarly, the issue of retail deregulation needs to be examined to determine whether a green market is emerging in a state where specialty product marketers can market and sell to end-use customers who are interested in wind energy. It is a part of the initial hard work of any entrepreneurial organization that sees an opportunity to make a profit where extant resources are readily available to meet the emerging demand.

8.3 Nebraska Market for Wind Energy

The majority of power purchase agreements are confidential, but industry data shows that wind generation can deliver electricity at a cost of 3¢ to 6¢ per kWh. Electricity from the 300-MW Stateline Wind Generating Project on the border of Washington and Oregon currently in development reportedly will cost less than 2.5¢ per kWh. A Wind Energy Supply Agreement indicates that Public Service Company of Colorado contracted for wind energy at a price of 3.72¢ per kWh in 2000. Certain NPA members were informed, but did not confirm, that wind energy is being developed as a wholesale product in Texas and sold at a long-term price below 3.0¢.

9. Project Schedules

A wind turbine project schedule has five major phases: Planning, Design and Procurement, Construction, Commissioning and Acceptance, and Operation. Each phase consists of separate tasks. These tasks are representative of the NDWGP project, and may not be all-inclusive. Details of the schedule for the Wind turbine facilities were studied and time frames for each have been estimated.

In addition, the schedule needs to include the parallel work of the local distribution utilities to be able to collect the output of the generators and deliver them to a point of interconnection to the regional transmission system. In order to successfully interconnect the output of the collection system to the regional grid, the transmission entity must make the necessary transmission improvements to receive the output as well as clear any constraints in the grid that will arise as a result of the energy being delivered to the designated purchaser of the output.

The NPA believes that it will take approximately 30 months following authority to proceed with construction to bring the wind power facilities into commercial operation and have an appropriate interconnection contract for delivery to the remote load centers. Prior to that date, all of the legal, legislative, tax, formation, marketing, sales contracts, financing, licensing, permitting and authority to construct must be addressed and resolved. Considering the experimental nature of creating a public entity to undertake a venture of this nature, it may be two to two and a half years from start of the efforts to commencement of construction.

NPA has a serious concern about who will fund the at-risk development costs, which are at serious risk until non-recourse debt financing can be arranged. Non-recourse funding is not likely to be available until after the marketing, sales agreements and long-term transmission arrangements are completed and the critical permits and authorities to construct and operate are in hand. It is very clear that the public power entities in Nebraska cannot pledge their credit nor secure the at-risk start up costs for such a venture from revenues derived from sales to their customers.

10. Capital Requirements

The estimated cost of development and construction of the wind projects vary depending upon location and the range of transmission improvements necessary to receive the output of the turbine assemblies at the point of interconnection to the area transmission grid, as well as the cost of borrowed funds. The estimated capital requirements ranging from least to highest are as follows:

	Least Cost	Highest Cost
50 MW Wind Farm		
Construction Costs (1)) Interest During Construction) Financing Costs Capitalized)	$65,260,000	$67,960,000
Start Up Costs Capitalized	500,000	500,000
Total Capital Requirements 50 MW	$65,760,000	$68,460,000
200 MW Wind Farm		
Construction Costs (1)) Interest During Construction) Financing Cost Capitalized)	$255,900,000	$266,500,000
Start Up Costs Capitalized	500,000	500,000
Total Capital Requirements 200 MW	$256,400,000	$267,000,000

(1) Assumes Construction based upon 2001 dollars. Inflation would be at 2.5% from 2001 to the actual date of start of construction.

NPA cautions against complete reliance of these estimates of capital requirements for any purpose other than an understanding of the orders of magnitude. The actual numbers, based upon the size of a wind farm development, location and extraordinary transmission requirements, could vary measurably from those used in computing the business financial feasibility of the enterprise.

11. Financing Plan

A project of the nature contemplated in this report will require a substantial amount of funds for acquisition and construction of wind turbine assemblies and transmission facilities. Perhaps even more important is a source of risk capital that would be necessary up front to pay for the developmental work before the feasibility of the entrepreneurial venture can be established.

NPA believes that the initial working capital must be considered totally at risk until certain statutory impediments are removed and Federal tax opinions or IRS rulings obtained. In addition, the power marketing work remains to be done to the point of execution of an appropriate power sales contract, which will serve as the principle security for any long-term non-recourse loans. In addition, NPA believes that long-term transmission rights would have to be obtained to insure the lender that there is a transport path for the output of the wind generators in Nebraska to the load centers of the entity purchasing the output will be necessary for a successful debt financing of the cost of construction and repayment of the at-risk investment. NPA estimates the at-risk

capital to be in the range of $500,000 to pay the salaries, benefits and overhead costs of two full time professionals and the charges of the requisite lawyers to change the Nebraska laws and to obtain the opinions or IRS rulings governing the tax matters in this venture.

It is not at all clear where the at-risk capital would come from. Because of a different purpose and charter, a public power entity in Nebraska would not be permitted to lend its credit, nor transfer any of its retained earnings to the new public entity established to own, build and operate the wind facilities. Similarly, unless funded by individual and corporate charatible donations, a foundation structure woul dbe similiarly strained to come up with initial working capital.

The non-recourse debt may be too difficult to effect even after the legal, marketing and transportation arrangements are established. NPA has assumed for purposes of analysis that the new entity could attract 100% debt financing with 30-year maturity through a consortium of banks. The debt financing would probably require both a pledge of net revenues from the operation of the wind generators, and a mortgage on the assets of the entity including the power sales contracts, transmission arrangements and the physical plant.

12. Operations of the Wind Generating Entity

One of the important pieces of this study was the development of the cost analysis of a public wind-powered facility in Nebraska. The following section details the assumptions used in the economic analyses.

12.1 Assumptions

A business case for the scope of a pubic entity wind energy merchant enterprise depends upon the ultimate efficacy of several assumptions. These assumptions fall into four major categories: Equipment, Economic, Construction, and Operations and Maintenance. The assumptions used in the calculations were considered reasonable by the NPA for purposes of analysis that is broad in nature and not to be used for raising venture or debt capital. **Before any effort is made to secure start up working capital to begin this venture, the efficacy of these assumptions need to be established.**

Equipment assumptions deal with the physical attributes of the wind turbines themselves. These assumptions include:

- 750 kW Zond Z-50 wind turbines with life of 30 years
- 65 meter towers
- Class 4 or better wind area.

The economic assumptions deal with general information related to the wind resources and financial costs. These assumptions are:

- The general escalation or inflation rate is 2.5% per year.
- The interest rate assessed on the capital costs is 7.5%.
- The sales tax rate is 5.0% of the costs of the Production and Transmission plant.

The Construction costs assumptions deal with the capital needed to construct the wind facility. These assumptions include:

Construction time is 2.5 years, from siting, permitting to start-up.

- The cost of wind turbine assemblies installed is $1,000 per nameplate kW.
- The transmission costs to collect the output are $110 per nameplate kW.
- Administrative and general costs are equal to 2% of construction costs.
- IDC is calculated at 7.5% over the construction period.
- Financing costs are 2% of the total capital costs due at the time of financing.

Finally, the Operation and Maintenance (O&M) costs relate to the ongoing operation and maintenance of the wind facility. The O&M assumptions include:

- Both variable and fixed O&M costs are escalated at 2.5%.
- All O&M costs do not change relative to the amount of electricity generated.
- O&M costs are $30 per kW per year including overhaul and replacement.
- Insurance costs are $2 per kW per year.
- Annual A&G costs are 15% of fixed O&M costs.
- Annual land rental costs are assumed at $1000 per turbine per year.
- 35% capacity factor

Sensitivity studies were performed on some of the major assumptions. The team developed a High Costs case that adjusted the following assumptions:

- An interest rate on capital of 8.0%
- An equipment life of 20 years
- Fixed annual O&M costs of $35 per kWh
- 25% capacity factor for a Class 3 wind resource

The Low Costs case used the base assumptions with the following adjustments:

- Construction time of 1.5 years
- A 40% capacity factor for a class 5 wind source.

12.2 Start Up Schedule

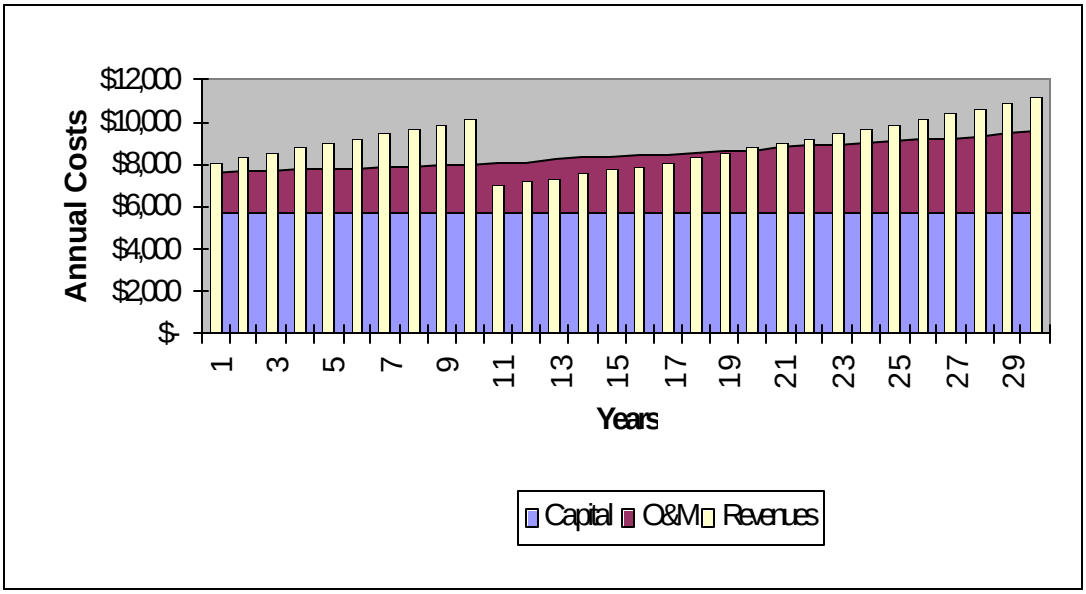
As indicated previously in this report, NPA believes a cost allowance for start up until long term non-recourse debt financing can be achieved for the entire project costs is approximately $500,000. The first tasks would be to hire a senior executive to head up the effort, and to begin resolving the legal and organizational issues. The second task entails hiring an external lobbyist and law firm to address the organizational issues, including working with the state Legislature, NPRB, DOE and the U.S. Treasury Department Parallel to the second task would be a full time person to do the marketing and sales effort to obtain commitments for the output of the wind project and arranging long term transmission paths to the load centers. The first and second task is expected to take up to two years. The third task would involve preliminary engineering, permitting, and financing the cost of acquisition and construction of the wind turbine assemblies and improvements in the transmission collection system. The third task and the construction phase are estimated to take 2.5 years.

13. Forecast of Financial Results

Based on the assumptions outlined above for capital cost and operation costs of a 50 MW wind farm the first year's costs would be approximately $1.8 million. First year annual costs for a 200 MW wind facility would be approximately $7.3 million.

At a 35% capacity factor, the proposed wind facility would cost 4.85 cents per kWh in the first year. With federal REPI credits of 1.7 cents per kWh, the net revenue requirements from the sale of the output of the wind farm would be 3.15 cents per kWh. In the High Costs case, the wind facility can generate electricity at 6.4 cents per kWh in the first year. In the Low Costs case, the wind facility can generate electricity at 2.4 cents per kWh in the first year. The above cost figures do not include wheeling charges beyond the interconnection to the transmission system.

The revenues of a wind-powered facility were estimated by assuming a wholesale contract with a distributor outside of Nebraska that begins with a fixed price and escalates with inflation. At a 35% capacity factor, the total costs of a 50 MW wind facility over a 30-year period is $253 million. A price of 3.3 cents per kWh escalated at 2.5% per year will yield $256 million net present value over a 30 year period. A wholesale contract priced at 3.5 cents per kWh and escalating at 2.5% per year yields revenues over the 30-year period of $270 million. Net revenues for the project are positive for the years 1 through 10 (the period of eligibility for the Federal REPI credit). After the REPI credit is extinguished, the net revenues are negative from years 11 to 19, and become positive beginning in year 20. A graphical representation is provided below. Scaling to a 200 MW wind farm would not appreciably affect the financial performance of the enterprise. Any wholesale contract with a starting price above 3.5 cents per kWh would yield a similar performance as shown in the following graph, only with higher accumulated net revenues. **Based upon recent information that NPA has about competitive market prices for wind power in Texas and the Northwest, prices at 3¢ or above do not currently appear to be likely.**



The above depiction of positive net revenues over the life of the facilities depends upon the Department of Energy granting the new public entrepreneurial entity REPI credits for the first ten years of operation. Even with ten years of Federal subsidy, the entity would have to be able to sustain several more years of deficits after the subsidy ends before the revenues under the terms assumed for the power sales contract begin to exceed all in costs. NPA has some serious doubts that a quasi-public entity without measurable equity capital into the project could attract the amount of long-term non- recourse debt needed for 100% financing.

14. Conclusions

The Nebraska Power Association has estimated the costs to construct, own, operate and maintain wind facilities on large wind farms at various locations in Nebraska. The costs of the necessary transmission additions were also estimated. We have reviewed the regional market for wind energy and looked at possible organizational structures that could be used to own, operate, market and deliver wind generated electricity at wholesale outside of Nebraska with the fundamental purposes of transferring potential profits of such a venture to the State of Nebraska.

Based upon the information developed in this report, we conclude that it would not be financially nor economically feasible at this time to pursue a public power entrepreneurial venture of this nature.

Further, NPA concludes that the development costs for an entrepreneurial venture of this nature exceeds the financial risk that the members of NPA would be willing to incur and we do not believe that a non-recourse loan to cover such costs would be acceptable to a bank. There is just too much developmental work to be done and costs to be incurred prior to determining that a willing buyer outside of Nebraska would execute a take-or-pay contract for a significant portion of the output of wind generation in Nebraska at a price sufficient to cover our costs and provide the State with some profit.

NPA members will nevertheless continue to be committed to pursuing renewable energy for our own firm customer obligations in and out of Nebraska. That pursuit will likely be through smaller scale, customer-supported wind and landfill gas projects until there are further improvements in the economics of wind energy in Nebraska.

APPENDIX A

SECTION 1
EXECUTIVE SUMMARY

The general public has viewed environmentally friendly forms of electric generation favorably for many years, but until recently the cost associated with many renewable technologies was prohibitively high. Advancements in wind power technology in the U. S. and abroad have led to substantial decreases in the cost of wind energy over the past decade. This coupled with record high and widely fluctuating natural gas prices and capacity shortages that have resulted in wholesale price spikes, have caused resurgence in the development of renewable generation, including wind, as the economic cost of these resources compared to traditional resources has narrowed.

Wind energy must contend with issues relating to reliability, as well as concern from some quarters citing the visual aesthetics and avian impact. However, under the current market conditions, R. W. Beck believes that wind power is economically viable in certain cases and expects the growth in wind generation to continue.

Demand for renewable generation capacity originates from the marketing activities of utility and energy service providers as well as from regulatory or legislatively mandated utility programs. Under green marketing or green pricing programs end-use customers frequently purchase renewable energy at a premium price. But due to a variety of factors, only about one percent of customers have subscribed to green pricing programs, indicating it is still a niche product. According to the U.S. Department of Energy (DOE), 75 megawatts (MW) of renewable energy had been built in the U.S. in response to green pricing programs as of December 2000. At that time an additional 205-MW of capacity were planned.

Some states have mandated renewable portfolio standards as part of their deregulation initiatives, however, other states may issue directives to their Investor Owned Utilities increasing renewable requirements regardless of industry restructuring. Demand for wind energy created by state mandate or through a utility's resource planning process is less likely to command a price premium, as it must compete with other technologies.

The Colorado PUC's recent order to Xcel Energy (Xcel) to negotiate for wind power as part of their rate base, the entry of major international petroleum organizations into the arena, and the DOE's goal of using wind power to supply 5 percent of U.S. electricity needs by 2020, indicate that wind energy will play a growing, though still minor, role in the future of electric supply.

MANDATED AND VOLUNTARY DEVELOPMENT

In most of the states surrounding Nebraska and covered in this report, legislators and utility commissions have not addressed renewable energy development. Across the country, states that have moved forward with deregulation have often dealt with renewable resource issues as part of their regulatory or legislative restructuring agenda.

Only four states under investigation, Colorado, Wyoming, Minnesota, and Iowa, have utility-scale wind projects total over 20-MW of capacity. Minnesota and Iowa are the only two states that also have renewable portfolio standards (RPS) mandated for their investor owned utilities, and these two states have progressed the farthest in developing their wind potential.

The state mandate in Minnesota calls for Xcel to own or contract for 425-MW of renewable capacity by the end of 2002. The majority of output from the 270-MW+ of large-scale wind projects developed in Minnesota in the last several years is being sold to Xcel to meet its legislative mandate. In February 2001, Xcel signed a power purchase agreement that when operational will fulfill its RPS obligation.

Iowa ranks third in energy production from renewable resources, behind California and Minnesota. The state Alternative Energy Law requiring investor-owned utilities to obtain 2 percent of their electricity from renewable sources was implemented in 1998. The 2 percent translates to a combined total of 105-MW of generation from renewable and small-hydro sources. During 1998 and 1999, Iowa installed 240-MW of new wind capacity, greatly exceeding the mandate.

- Mid-American buys 130-MW of renewable energy in Iowa, and in July of this year the company received bids for an additional 100-MW of wind energy for what the utility classified as a way to diversify MidAmerican's power needs and respond to its customers' desire for green energy.
- According to an Alliant Energy spokesperson, the utility buys approximately 200-MW of wind power, or about 7 percent of its Iowa energy supply from wind sources.

Colorado does not have an RPS, however, the PUC recently ordered Xcel to negotiate a contract for a proposed 162-MW wind plant as part of the company's Integrated Resource Plan (IRP) for 2005. Colorado is also home to Xcel's *Windsource* program, the nation's largest customer-driven wind development with capacity that is slated to grow to 56-MW in 2001. In addition to the company-owned wind generation, Xcel has several power purchase agreements in place to buy wind energy.

The other state of interest that has utility-scale sizable wind production facilities is Wyoming. There are no renewable or wind energy mandates in the state, and most of wind power is being sold into the Pacific Northwest or Colorado.

PRICING

Residential participants in utility green pricing programs generally pay $2.50 to $10 per month extra. Price premiums for energy-based green pricing offerings range from 0.4¢ per kWh to as much as 20.0¢ per kWh for 100 percent new renewable energy content, with a median of 2.5¢ per kWh.

Competitive green power products typically carry a price premium of 1.0¢ per kWh to 2.0¢ per kWh. Some marketers are using a fee-based system, where they charge a fixed monthly program fee with the electricity priced at the default market price.

The majority of power purchase agreements are confidential, but industry data shows that wind generation can deliver electricity at a cost of 3¢ to 6¢ per kWh. Electricity from the 300-MW Stateline Wind Generating Project currently in development reportedly will cost less than 2.5¢/kWh, a record-breaking low. A Wind Energy Supply Agreement indicates that Public Service Company of Colorado contracted for wind energy at a price of $0.0372/kWh in 2000.

SECTION 2
DETAILED FINDINGS

INTRODUCTION

Nebraska Public Power District, in conjunction with NPA, is exploring the wind energy market in the states of North Dakota, South Dakota, Minnesota, Iowa, Kansas, Oklahoma, Missouri, Arkansas, Wyoming and Colorado. The purpose of this report is to assess market conditions and renewable development within each of these states.

Advancements in wind power technology over the past decade have led to substantial decreases in the cost of wind energy. In conjunction with volatile natural gas prices and capacity shortages resulting in wholesale price spikes, this decline in cost has caused resurgence in the development of wind energy resources.

Wind energy must contend with issues relating to its intermittent nature as well as several environmental concerns. However, under the current market conditions, R. W. Beck believes that in certain cases wind power is economically viable and expects the growth in wind generation to continue.

WIND ENERGY DEVELOPMENTS

Wind generation has boomed in popularity over the past ten years, particularly in Europe. According to the American Wind Energy Association (AWEA), some 3,800-megawatts (MW) of new utility-scale wind-energy generating capacity was brought online worldwide last year, for a total worldwide installed capacity of approximately 17,300-MW. The association predicts strong development of wind power in the U. S. in 2001, with several of the world's largest single wind farms expected to begin operation in Texas, California and the Pacific Northwest.

Electricity generated from wind energy is the fastest growing segment of energy production in the world, with an overall growth rate of 36 percent since 1997. Wind currently accounts for approximately 5,000-MW of electricity in the U.S., about 1 percent of all power production. In 2001, the nation's wind-generated power capacity is expected to grow by 60 percent or a total of approximately 2000-MW. According to AWEA, more than $1.5 billion will be invested in projects to generate electricity from wind power this year. Investment is growing because wind power has become more efficient.

California, Minnesota, Iowa, Wyoming and Texas are the five largest generators of wind energy in the U.S. As of March 2001, California had a total of 1,744-MW of wind generating capacity. Much of the development of wind power in the past

two years has been in Iowa, Minnesota, and Texas. Minnesota is projected to be developing as much as 1,600-MW of new wind capacity by 2010, while Texas is likely to develop 2000-MW by 2009. Colorado, Oregon, and Wisconsin also have sizable wind plants.

More than one-third of all U.S. consumers now have an option to purchase some type of green power product. Other states in which utility wind power projects are operating or being developed include Alaska, Hawaii, Kansas, Maine, Massachusetts, Michigan, Nebraska, New Mexico, New York, Pennsylvania and Vermont.

RENEWABLE ENERGY MANDATES

In the states under review, legislators and utility commissions have generally not addressed renewable energy development. Across the country, states that have moved forward with deregulation have often addressed renewable resource issues as part of their regulatory or legislative restructuring agenda. For example, the 1999 deregulation legislation in Texas included a Renewable Portfolio Standard (RPS) calling for 2000-MW of new renewable generation by 2009, creating a vigorous wind energy market in this state.

Only two of the states under investigation, Minnesota and Iowa, have mandated an RPS for investor owned utilities within their states, and perhaps significantly, these two states have progressed the farthest in developing their wind potential. The table below details wind capacity installed in each state of interest, mandated capacity, as well as information regarding the mandate where applicable.

TABLE 2-1
WIND PROJECTS AND POTENTIAL BY STATE
RANKED BY INSTALLED CAPACITY

State	Installed Capacity	Mandated Capacity	Legislative/ Regulatory Policy
MN	274-MW	425-MW	▪ In 1994, NSP (now Xcel Energy) was mandated to install 425-MW of wind power by the end of 2002. ▪ Full-cost accounting for externalities - PUC requires utilities to assign a monetary value to sulfur dioxide, carbon dioxide, nitrogen oxide, lead and mercury in evaluation of resource options. ▪ Wind easements.
IA	258-MW	2% of power mix from renewables or approximately 105-MW	▪ State laws implemented in 1998 require the state's IOUs to obtain at least 2 percent of the power mix from renewable sources.

TABLE 2-1
WIND PROJECTS AND POTENTIAL BY STATE
RANKED BY INSTALLED CAPACITY

State	Installed Capacity	Mandated Capacity	Legislative/ Regulatory Policy
WY	90.6-MW	None	• None
CO	21.6-MW	None	• In February 2001, Colorado PUC ordered Xcel to negotiate a contract for a 162-MW wind plant near Lamar, CO.
NE	2.8-MW	None	• Wind easements
KS	1.5-MW	None	• None
ND	0.85-MW	None	• None
SD	0.75-MW	None	• None
OK	0	None	• None
MO	0	None	• None
AR	0	None	• None

Minnesota, Iowa, Wyoming, and Colorado currently have utility-scale installed wind capacity of at least 20-MW. Information on development of wind energy within each of these states is detailed below.

MINNESOTA

Minnesota ranks second, behind only California in its production of renewable energy. Minnesota is actively engaged in promoting the development of renewable energy. The state offers programs in the form of tax incentives, production incentives, subsidized loans, net metering, green marketing, easements and RPS.

An RPS was created in 1998 that requires the state's largest generator, Xcel Energy (formerly NSP), to build or contract for 425-MW of renewable energy by 2003. The PUC requires utilities to consider the full-cost for externalities in their evaluation of resource options. Minnesota's electric cooperatives also offer green marketing, whereby the cooperatives have agreed to purchase renewable energy at a surcharge.

Output from the vast majority of large-scale wind projects in Minnesota is being sold to Xcel Energy (Xcel) to meet its legislative mandate to develop renewable energy in exchange for the right to store casks of spent nuclear fuel outside the Prairie Island Nuclear Plant. According to Xcel's 2000 Resource Plan filed with

the Minnesota Public Utilities Commission in July 2000, the company had contracts in place for nearly 300-MW of wind power and 75-MW of the planned 125-MW of biomass fuel electric generation.

In February 2001 Xcel chose Chanarambie Power Partners to develop 80-MW of wind energy from turbines along Buffalo Ridge in Minnesota. Chanarambie will build the wind farm and sell the power to Xcel for 20 years under a power purchase agreement. Developers in North Dakota, South Dakota, and Iowa had also submitted proposals for wind farms to supply Xcel. With completion of this project, Xcel will fulfill its requirement to develop 425-MW of renewable energy.

TABLE 2-2
LARGE-SCALE WIND PROJECTS IN MINNESOTA

274-MW TOTAL WIND CAPACITY					
Installed Capacity	**Owner**	**Developer**	**Project/ Location**	**Year Install -ed**	**Power Usage**
107-MW	Enron Wind Corp.		Lake Benton, MN	1998	30-year power purchase agreement with Xcel Energy
104-MW	FPL Energy	Enron Wind Corp.	Lake Benton II, MN	1999	25-year power purchase agreement with Xcel Energy
25-MW	Kenetech Windpower/ LGE Wind Power Partners		Lake Benton I, MN	1994	Power purchased by Xcel Energy
10.2-MW	Woodstock Windfarms/ Danmar & Associates		Woodstock, MN	1999	Power purchased by Xcel Energy
11.25-MW	Navitas (Northern Alternative Power)		Lakota Ridge/ Hendricks, MN	1999	Power purchased by Xcel Energy and Northern Alternative Energy
11.88-MW	Edison Capital	Northern Alternative Power	Shaokatan Hills/ Hendricks, MN	1999	Power purchased by Xcel Energy
UNDER DEVELOPMENT					
80-MW	Chanarambie Power Partners	Chanarambie Power Partners	Dakota Ridge, MN	2002	20-year power purchase agreement with Xcel Energy

IOWA

Iowa ranks third in energy production from renewable resources, behind California and Minnesota. The state has 42 wind facilities, and a total installed capacity of 258-MW of wind energy.

The state Alternative Energy Law requiring investor-owned utilities to obtain 2 percent of their electricity from renewable sources was implemented in 1998. The 2 percent translates to a combined total of 105-MW of generation from renewable and small-hydro sources. During 1998 and 1999, Iowa installed 240-MW of new wind capacity, greatly exceeding the mandate.

Mid-American Vice President Jeff Gust reports that the utility buys 130-MW of renewable energy in Iowa, more than meeting its mandated goal. In July 2001, the company received bids for an additional 100-MW of wind energy for what he classified as a way to diversify MidAmerican's power needs and to respond to its customers' desire for green energy.

According to Alliant Energy spokesperson, John Ruff, Alliant buys approximately 200-MW of wind power, or about 7 percent of its Iowa energy supply from wind sources.

The Iowa Distributed Wind Generation Project (IDWGP) is a consortium of seven municipal utilities that believe restructuring legislation will include mandates for renewable generation resources. IDWGP supports the Wind Energy Electric Project, with a cost of $2.8 million, $1.3 million of which was funded by the Turbine Verification Program, a research project of the Department of Energy and EPRI. Additionally, Iowa offers tax exemptions, loans and grants to promote renewable energy.

TABLE 2-3
LARGE-SCALE WIND PROJECTS IN IOWA

258-MW					
Installed Capacity	**Owner**	**Developer**	**Project/ Location**	**Year Installed**	**Power Usage**
42-MW	FPL Energy		Clear Lake, IA	1999	Power purchased by Alliant Energy
113-MW	Enron Wind Corp.		Storm Lake, IA	1999	20-year power purchase agreement with Mid-American Energy
80-MW	Enron Wind Corp.		Alta, IA	1999	20-year power purchase agreement with IES Utilities (Alliant Energy)

COLORADO

Colorado does not have an RPS, however the Colorado PUC recently ordered Xcel to negotiate a contract for a proposed 162-MW wind plant as part of the company's Integrated Resource Plan (IRP) for 2005.

There is currently one wind facility in Colorado, it is located in Ponnequin, in northeastern Colorado and owned by Xcel.

Xcel's *Windsource* program in Colorado is the nation's largest customer-driven wind development program, and it will add 36-MW of wind capacity by the end of 2001. The additional wind generation will bring Windsource's capacity to 56-MW. The new capacity will include a 10-MW expansion of Xcel's Ponnequin Wind Facility, located in northern Colorado. Xcel is developing the site and will own the facility. The Vestas American Wind Technology turbines are expected to be in service by the end of August. In addition to the company-owned wind generation, Xcel has a power purchase agreement to buy 26-MW of wind energy from enXco, Inc., a developer, manager and owner of wind power plants worldwide. enXco plans to build the wind farm near Sterling, Colorado.

TABLE 2-4
LARGE-SCALE WIND PROJECTS IN COLORADO

21.6-MW					
Installed Capacity	**Owner**	**Developer**	**Project/ Location**	**Year Installed**	**Power Usage**
21.6-MW	Xcel Energy/Energy Unlimited		Ponnequin	1998	Xcel Energy
Under Development					
10-MW	Xcel Energy	Xcel Energy	Ponnequin	2001	Xcel Energy
26-MW	EnXco	EnXco	Sterling, CO	2001	Power purchase agreement with Xcel Energy

WYOMING

The other state of interest that has utility-scale sizable wind production facilities is Wyoming. There are no renewable wind energy mandates in the state, and most of wind power is being sold into the Pacific Northwest or Colorado.

TABLE 2-5
LARGE-SCALE WIND PROJECTS IN WYOMING

90.6-MW					
Installed Capacity	**Owner**	**Developer**	**Project/ Location**	**Year Installed**	**Power Usage**
43-MW	PacifiCorp and Eugene Water & Electric Board (EWEB)	SeaWest WindPower and Tomen Power Corp.	Foote Creek Rim I & II	1999	Power purchased by PacifiCorp (80% ownership), EWEB (20% ownership). BPA has power purchase agreement for 15-MW.
25-MW	Cinergy Global Power	SeaWest WindPower and M & N WindPower Inc.	Foote Creek Rim III	1999	Power purchase agreement with Xcel Energy.

TABLE 2-5
LARGE-SCALE WIND PROJECTS IN WYOMING

90.6-MW					
Installed Capacity	**Owner**	**Developer**	**Project/ Location**	**Year Installed**	**Power Usage**
16.8-MW	Cinergy Global Power & SeaWest WindPower	SeaWest WindPower	Foote Creek Rim IV	2000	20-year power purchase agreement with BPA.
Under Development					
50-MW	SeaWest WindPower	SeaWest WindPower	Rock River I	Fall 2001*	20-year power purchase agreement with Pacificorp**

* Estimated completion date

** Provision of PacifiCorp's merger with Scottish Power in 1999 called for the development of an additional 50-MW of renewable resources.

PRICING

Residential participants in utility green pricing programs generally pay $2.50 to $10 per month extra. Price premiums for energy-based green pricing offerings range from 0.4¢ per kWh to as much as 20.0¢ per kWh for 100 percent new renewable energy content, with a median of 2.5¢ per kWh. Many retail pricing programs offer 100-kWh blocks of renewable energy at an additional cost of $2.50 per month.

Competitive green power products typically carry a price premium of 1.0¢ per kWh to 2.0¢ per kWh. Some marketers are using a fee-based system, where they charge a fixed monthly program fee with the electricity priced at the default market price. For example, Green Mountain Energy will offer 100 percent wind power in Texas. The fixed rate price will be 9.2 cents/kWh plus a $4.95 monthly fee.

The majority of power purchase agreements are not public documents; contacts with the utility commissions of Colorado, Minnesota and Iowa resulted in the determination that confidential pricing information would not be obtainable. However, industry data show that wind generation can deliver electricity at a cost of 3¢ to 6¢ per kWh. Electricity from the 300-MW Stateline Wind Generating Project currently being developed reported will cost less than 2.5¢/kWh, a record-breaking low.

According to a 2000 Wind Energy Supply Agreement (WESA) the Public Service Company of Colorado contracts for 77.0 gigawatt hours (GWh) of wind energy

per year. The price for first 35.0 GWH is $0.0372/kWh, while the price for energy between 35.0 GWh and 77.0 GWh is $0.03232/kWh for the first year. Subsequent years are priced similarly with adjustments for inflation.

Personal communications with Mr. Andy Sulkko, Product Portfolio Manager, Xcel Energy, revealed that Xcel is developing wind power as part of its IRP as well as to fulfill the Prairie Island mandate. Wind is also being developed for green pricing programs. The company's position is that high profile green pricing programs improve its image and also allow the company to earn a higher rate of return than wind developed as part of their overall portfolio.

With developers responding to requests for proposal for generation and utilities entering into power purchase agreements for renewable energy for inclusion into their portfolio, wholesale prices of wind energy are becoming more competitive with traditional generation.

- As part of Xcel's IRP process in 2001 it received numerous proposals for generation, the firm contracted to move forward with five natural gas-fired facilities based on economic criteria. The Enron Wind project in Lamar was bid in response to the general IRP, not designed to receive renewable set-asides, and it competed head-to-head with the natural gas projects. If negotiations are successful, the project will be added to portfolio and hence the rate base. According to Mr. Sulkko "Every time we go out for bid from now on, we think we will see head-to-head competition [from wind developers]."
- In July 2001, Mid-American received bids for an additional 100-MW of wind energy beyond the mandated level. The company stated that adding more renewable resources is a means to diversify its power needs as well as respond to customers' interest in green energy.

RENEWABLE ENERGY ENVIRONMENT

Wind energy is the most prominent renewable energy source utilized in both competitive markets and green pricing programs. Price premiums for energy-based green pricing offerings range from 0.4¢ per kWh to as much as 20.0¢ per kWh for 100 percent new renewable energy content, with a median of 2.5¢ per kWh. Many programs offer customers the opportunity to purchase blocks or percentages of renewable energy, or meet all of their electricity needs from green power.

GREEN PRICING

Green pricing is an optional utility service that gives customers an opportunity to support a greater level of utility company investment in renewable energy technologies. Many utilities offer green pricing to build customer loyalty and expand business lines and expertise prior to electric market competition. More than 80 utilities in 28 states offer or have announced their intention to develop green pricing programs for their customers. Many of these programs have

resulted in new renewable energy project development. A total of nearly 73-MW of new renewable energy capacity was installed by utilities as a result of green pricing programs in 1999, and utilities announced plans to install 120-MW of additional renewable capacity in 2000. Of that, approximately 75 percent of added and planned renewable capacity is wind.

There are typically three types of Green Pricing Programs:

- Contribution program – customers contribute to a utility-managed fund for renewable project development. The majority of contribution projects have supported a solar energy technology called photovoltaics (PV).
- Capacity-based program – customers choose to purchase a fixed block of electricity capacity to be generated from renewable sources. These programs have offered PV exclusively.
- Energy-based program – customers choose to purchase a fixed block or percentage of their energy requirement from renewable sources. Most of the energy-based programs in place or being planned use wind power.

GREEN POWER MARKETING

Green power marketing is the sale of green power in competitive markets, where multiple suppliers and service offerings generally exist. As of July 2000, retail consumers could purchase competitively marketed green power in California, New Jersey and Pennsylvania and in some New England states. Green power is sold competitively in wholesale power markets in Illinois and New York.

California and Pennsylvania have been the most active competitive markets for green power. About 15 percent of customers who switched to an alternative supplier in Pennsylvania switched to a green power marketer. In California, few residential customers switched, but because of state-based market incentives virtually all who did switch suppliers are receiving green power.

In competitive markets, marketers are under pressure to minimize their green power premiums, however, they must also cover the costs associated with customer education and marketing. Competitive green power products typically carry a price premium of 1.0¢ per kWh to 2.0¢ per kWh. Some marketers are using a fee-based system, where they charge a fixed monthly program fee with the electricity priced at the default market price.

PARTICIPATION

Customer response to green power offerings in regulated and competitive markets has been similar. Customer participation in utility green pricing programs has been as high as 7 percent, but generally is around 1 percent or less. Moorhead Public Service has the highest participation rate with 7.3 percent of its customers buying "green" energy. Holy Cross Electric has a participation rate of 4.1 percent, while 3.6 percent of Cedar Falls Utilities' customers participate in

their wind energy program. In Pennsylvania and California as many as 2 percent of customers have actively switched to a green power provider.

TYPES OF CUSTOMERS

While much of the focus for green pricing and green marketing has been on residential customers, some businesses have found that green power purchasing can help meet corporate goals related to the environment and sustainable business practices. In addition to business customers, municipalities, government agencies and other organizations are purchasing green power. Examples of corporations and other entities that have opted for green power include: Birkenstock Footprint Sandals, Fetzer Vineyards, Kinko's, New Belgium Brewing Co. Inc., Patagonia, Toyota Motor Sales USA, City of Chicago, Los Angeles World Airport, City of Oakland, City of Santa Barbara, City of Santa Monica, City of Seattle, Denver-Area Federal Agencies; General Service Administration; Oak Ridge National Laboratory; U. S. Environmental Protection Agency, U. S. Postal Service; Bay Area Episcopal Churches, Carnegie Mellon University, and the University of Colorado.

GREEN POWER MARKETERS

WHOLESALE

A variety of independent power producers (IPP), utilities and renewable power firms have entered the wholesale wind power market.

FPL Energy – FPL Energy is the largest generator of wind power in the U. S. It operates wind facilities exceeding 1,000-MW of capacity in Iowa, Texas, Minnesota, Wisconsin, Oregon, and California and has a net ownership of approximately 600-MW. The company has four wind projects under construction that will add nearly 850-MW by the end of 2001.

- FPL Energy's 30-MW Montfort Wind Farm in Iowa County, Wisconsin sells wind power under multi-year contracts to Wisconsin Electric-Wisconsin Gas and Alliant Energy.
- In May 2001, FPL Energy announced development of 110-MW wind farm in Gray County, Kansas and will sell the electricity output to UtiliCorp United under a multi-year contract.
- In April 2001, FPL Energy announced the development of a new wind power project to be located on King Mountain in Upton County, Texas. The project will have a generating capacity of 280-MW. It will be owned and operated by FPL Energy, and electricity generated by the new facility will be sold to Reliant Energy, Austin Energy and Texas-New Mexico Power.
- In January 2001, PacifiCorp Power Marketing, Inc. (PPM) and FPL Energy announced an agreement to develop and market power from the world's largest single wind energy development, the 300-MW Stateline Wind

Generating Project. FPL Energy will build, own and operate the new wind farm along the Washington-Oregon border. PPM will purchase and market the entire output of the project over a 25-year period.

Enron Wind Corporation - A subsidiary of Enron Corporation, Enron Wind is a fully integrated wind power company. Over the past two decades it has developed and/or sold more than 4,500 wind turbines and 1,600 megawatts of capacity around the world. It has wind facilities in Palm Springs, California, Minnesota, Iowa, and Texas and has proposed building facilities in Colorado. The firm plans to build a 135-MW wind power facility in Texas and Enron Power Marketing will purchase the project's electricity under a long-term agreement for resale into the Texas wholesale electricity market. This will be the first major wind facility that allows wholesale customers to purchase portions of the wind power production.

Atlantic Renewable Energy Corporation - Atlantic Renewable is developing 15.6-MW wind project in Pennsylvania, looking for entities interested in purchasing green power. The wind farm is being built by Atlantic Renewable Energy and Zilkha Renewable Energy. Exelon Power Team will buy the wholesale output and deliver it into the grid, while Community Energy will sell the supplies to retail users. Carnegie Mellon University will buy 5 percent of its total electricity from the wind farm purchasing 4,800-MWh under a one-year contract, paying 2¢/kWh above conventional utility rates.

Bonneville Power Administration (BPA) – BPA markets a green power blend to about 10 wholesale customers, primarily municipal and rural electric cooperatives in the Pacific Northwest. For the wind energy supply, BPA has contracted to purchase 1.8-MW from three turbines in Wyoming, which are jointly owned by Eugene Water & Electric Board and PacifiCorp. In 2001, BPA issued request for proposals for wind generation, in June it selected proposals for seven wind projects in Washington and Oregon with a combined capacity of 830-MW. The agency plans to enter into predevelopment agreements with the project developers, but will assess the environmental impacts of the projects before signing final power purchase contracts. The average first-year cost of the wind power is expected to be less than $30 per MWh.

Commonwealth Energy Corporation – Commonwealth purchases its green power from Calpine and sells its retail product at a discount to the PX price. It supplies the city of Santa Monica.

Exelon Power Team/ ComEd - ComEd and the Environmental Resources Trust, have teamed to offer the first wholesale renewable power product in Illinois. *EcoPower* is sold through the APX Midwest Market. Electricity suppliers purchase "green tickets" and can use the *EcoPower* label in their retail marketing. Profits are used to develop new renewable resources in Illinois.

Exelon Corporation is the company formed by the merger of PECO Energy Company and Unicom Corporation, the parent company of ComEd.

- In 2001, Exelon Power Team, the wholesale power marketing division of Exelon Generation, signed 20-year power purchase agreements to purchase 9-MW of output from Somerset Wind Farm and 15-MW of output from Mill Run Wind Farm both located in Pennsylvania.
- In May 2001, Exelon Power Team and Waymart Wind Farm, LLC, announced a 20-year agreement for Power Team to purchase the output of a 50-MW wind farm located southeast of Scranton, Pennsylvania. This agreement increases Exelon Power Team's wind portfolio to 74-MW, making it the largest wind marketer east of the Mississippi River. It will manage the wholesale delivery of the wind energy to the power grid for resale. With that agreement in place, Community Energy, a green electricity marketing company headquartered in Wayne, Pennsylvania, will market the green power to commercial and residential customers. The project is supported by wind energy production incentive financing from the TRF Sustainable Development Fund, a fund devoted to renewable and clean energy projects administered by The Reinvestment Fund in Philadelphia.

PacifiCorp – PacifiCorp provides green power in the wholesale market. It owns 80 percent of the 41.4-MW Wyoming Wind Project, and built wind turbines in California to provide 1.4-MW of wind power to Green Mountain Energy.

PG&E National Energy Group - National Energy Group built an 11.5-MW wind project in Madison County, New York. It is selling "certificates" that represent air emissions avoided with each MWh of wind-generated power.

Platte River Power Authority - Platte River provides wholesale electric power to four municipal electric systems in northern Colorado. Platte River operates under an organic contract with the municipalities of Estes Park, Fort Collins, Longmont and Loveland on whose behalf Platte River acts as a wholesale electric utility, acquiring, constructing and operating generation capacity and supplying electric energy on a requirements basis. Platte River owns and operates a wind farm in Wyoming, wholesaling the output to its four municipal customers.

Western NY Wind Partners - A wind project was developed in 2000 for construction in western New York by Vestas American Wind Technology, under a contract administered by Niagara Mohawk — the utility is required to build a wind facility under its restructuring settlement agreement. Vestas is building the project on behalf of Western N.Y. Wind Partners, LLC which plan to sell the power from the 5-MW to 9-MW project to green power marketers serving the New York market.

Reliant Energy - Reliant Energy of Houston, Texas announced its involvement in two new renewable energy projects in 2000. The projects will serve the Texas power market. Reliant will purchase the output from a 208-MW wind power facility to be built in West Texas and a total of 44-MW of landfill methane generation from 12 sites located in urban areas of the state. Although some of the energy will be sold into the grid to meet the state's RPS, Reliant also plans to market the power to rural electric cooperatives and to other retail energy

providers after the state's energy markets are restructured in 2002. Plans call for Reliant to begin receiving power from both projects by the end of 2001.

RETAIL

Numerous market research studies have shown that electric customers are interested in purchasing energy from renewable sources. According to *Willingness to Pay for Electricity from Renewable Resources: AReview of Utility Market Research,* by Barbara Farhar, at National Renewable Energy Laboratory (NREL), approximately half of customers are "somewhat likely" or "very likely" to voluntarily pay more for electricity from renewable sources. NREL reviewed 14 surveys in 12 utility service territories in five Western/Southwestern states collected in 1995 through 1997, as well as EPRI research from a 1997 study. An average of 70 percent of respondents would pay $5 more per month, while 38 percent would pay $10 more and 21 percent would pay $15 per month more. Although most studies focused on residential customers, there appears to be an important market segment among business customers who will pay more for renewables.

According to the National Wind Coordinating Committee's (NWCC) *Consumer Interest in Green Power* report, approximately 40 utilities have launched programs to offer an alternative green power product. About a dozen green power marketers are operating in competitive markets, including several that offer multiple products. Interest in green power is broad and consumer support for environmental improvement cuts across demographic profiles. Although market research findings are consistently favorable to green power, marketing results generally have shown much lower levels of actual response to green power offerings. Regulated utility programs have so far typically experienced participation of less than 1 percent to 2 percent of residential customers, levels usually have been achieved in one to two years. Residential participants in utility green pricing programs generally pay $2.50 to $10 per month extra. In Colorado about 1 percent of the green customers are commercial, industrial or government customers, but they represent 19 percent of the demand.

Reasons NWCC suggests for far fewer customers actually buying green power are:

- Market research is hypothetical
- Socially responsible answer
- Free-rider effect – share environmental benefits without paying
- Programs not marketed aggressively
- Experimental programs, limited size
- Customer inertia supported by default service at or below market price
- Green pricing programs or products not strong enough or lack credibility to persuade customers to participate

- Longer time horizon for decision.

While the high levels of purchase intent have not been realized in the market, wind energy retailers include utilities in 20 states, as well as energy service providers in deregulated states. Below is a listing of retail participants.

ALLEnergy Marketing Company - ALLEnergy Marketing is joint venture of New England Electric System and Eastern Enterprises that formed ReGen[sm] a renewable power service that residential and small commercial customer can purchase annual blocks of service at a premium of $8 per month.

ABAG Power – Association of Bay Area Governments (ABAG) an organization of 59 cities, counties and public agencies that formed a power pool buying renewable energy and taking advantage of state incentives.

Boston Oil Consumer Alliance – BOCA is a heating-oil cooperative in Massachusetts which buys green power for its members from ALLEnergy. About 2 percent of BOCA's 6000 members have signed up for the plan which charges a price premium of 3.6¢/kWh.

Community Energy, Inc (CEI) – CEI is an electricity retailer based in Wayne, Pennsylvania. CEI was founded in 1999 with the backing of several environmental groups to develop and market renewable electricity. CEI partners with existing electric suppliers to make new renewable electricity available to as many commercial and residential customers as possible. CEI presently offers a product called *New Wind Energy*.

The firm markets a wind power product, *Pennsylvania Wind Energy* to small and mid-size firms in Philadelphia. Energy Unlimited, Inc. constructed two 65-kW wind turbines to supply power for the program and the wind power is sold to business customer in blocks of 400-kWh per month. CEI put together the first commercial wind plant in Pennsylvania and sold the output almost immediately.

CEI is marketing the output of the Mill Run wind project that Exelon Generation Company bought under a long-term power purchase agreement. CEI is currently working with Exelon Power Team and wind developers to bring 70-MW of new wind power on-line, which will almost triple the amount of wind energy in the eastern U.S. The new Pennsylvania wind farms will supply green electricity into a multi-state region that includes Pennsylvania, New Jersey, Delaware, District of Columbia, Maryland, Ohio, New York, and part of Virginia.

Carnegie Mellon University (CMU) will become the largest purchaser of wind-generated electricity in the U.S. in the fall of 2001. CMU agreed to a one-year contract that will provide the university with 5 percent of its total electricity needs, which will come from a windmill farm now under construction in Fayette County. CMU's agreement is with Community Energy Inc. and Environmental Defense, a national environmental lobbying organization.

Conectiv Energy – Conectiv offers two *Green-e* certified power products in Pennsylvania *Nature's Power 100* and *Nature's Power 50* to business customers in PECO's service territory.

Connecticut Energy Cooperative – Connecticut Energy offers 100 percent renewable energy product certified by *Green-e*. The product, *EcoWatt*, is a mix of landfill, small hydro, and wind resources and is offered to residential customers for 6.5¢/kWh, a premium of 1¢/kWh over the standard offer.

Energy Cooperative Association of PA – Energy Cooperative sells 100 percent renewable energy product certified by *Green-e* . The product, *EcoChoice 100*, is a mix of biomass and small hydro sold to customers in PECO's service territory.

Enron - *Patagonia* buys 100 percent renewable energy from Enron for its 14 California facilities. Enron is supplying the power from a 16-MW wind power facility near Palm Springs.

Go Green.com – Go Green sells 100 percent renewable energy in California. It buys its green power through Automated Power Exchange (APX) Green Power Market and sells its *Ecosave* product at the default price plus a monthly charge of $3.89.

Green Mountain Energy – Green Mountain offers *100 percent Renewable Power* and *Wind for the Future* with 25 percent of the power content from new wind turbines. Both are *Green-e* certified. Green Mountain offers three green products in Pennsylvania *Eco Smart, Enviro Blend* and *Nature's Choice.* The company's market activities have resulted in the development of several wind projects in California and Pennsylvania.

Mack Services Group - Mack Services provides a 100 percent renewable energy product in Pennsylvania. The power is purchased from Virginia Power.

PG&E Energy Services – PG&E Energy Services offers three green power products in California, two of which are *Green-e* certified. PG&E Generating constructed the 8-MW Madison Windpower Project in Madison County, New York, in 2000 to sell the wind power in the competitive market in New York.

Essential.com and Utilty.com - Essential.com and Utilty.com are two Internet based companies that have recently exited the retail power market due to high costs and uncertainty created by the California energy situation. Utility.com had offered *GreenPlanet*, a *Green-e* certified 100 percent renewable energy product in California, while Essential.com had been marketing the *ReGen* green power product.

Retail programs offered by utilities operating in the states in close proximity to Nebraska are detailed below.

CURRENT STATUS OF WIND ENERGY IN SELECTED STATES

While many of the states surrounding Nebraska have substantial wind potential, development of this resource varies significantly from state to state. There has been a noteworthy increase in development of wind energy in Minnesota and Iowa in recent years, while states such as North Dakota, Kansas and South Dakota have moved more slowly.

MINNESOTA

The state of Minnesota has 142 wind energy facilities with 274-MW of installed capacity. Seven of these facilities have a capacity of 1-MW or greater, including two farms owned by Enron. Kenetech Wind Power also owns a 25-MW facility. Minnesota ranks second, behind only California in its production of renewable energy.

Minnesota is actively engaged in promoting the development of renewable energy. The state offers programs in the form of tax incentives, production incentives, subsidized loans, net metering, green marketing, easements and RPS. An RPS was created in 1998 that requires the state's largest generator, Xcel (formerly NSP), to build or contract for 425-MW of renewables by 2003. Minnesota's electric cooperatives also offer green marketing, whereby the cooperatives have agreed to purchase renewable energy at a surcharge.

UTILITY GREEN PRICING/GREEN MARKETING PROGRAMS

Moorhead Public Service: Moorhead has 750-kW of capacity from a new wind turbine and offers *Capture the Wind* at a 1.5¢/kWh premium. Residential customers must make a three-year purchase commitment and can buy up to one-third of their power from wind, the rest comes from a hydro facility. Commercial customers can purchase monthly blocks of 1,500-kWh. Moorhead State University purchases more than half of the turbine's average output, and more than 100 other customers are on a waiting list.

Southern Minnesota Municipal Power Agency: SMMPA generates and sells electricity wholesale to its members, 18 municipally owned utilities located mostly in south central and southeastern Minnesota. The members sell 660-kW of wind power in blocks of 100-kWh per month at a premium of 3¢/kWh. Currently the 2016 blocks are totally subscribed.

Dakota Electric Association: Dakota Electric is a Minnesota distribution customer of Great River, and it purchases one-third of the output from the 2.0-MW Chandler wind project. A 12-month commitment is required from its customers and it sells the wind energy at a 1.22¢/kWh premium. The program is oversubscribed with about 1,000 customers, representing 1% of the utility's customer base.

Minnesota Power: is waiting for approval from the PUB, it plans to purchase 1-MW of wind power from Great River Energy and charge a 2¢/kWh premium.

East River Electric Power Cooperative: See South Dakota listing for details.

Great River Energy: See North Dakota listing for details.

Minnkota Power Cooperative: See North Dakota listing for details.

INCENTIVES, REGULATIONS AND POLICIES

Minnesota offers sales tax and property tax exemptions related to wind energy. It also offers a production tax credit for new, small wind energy projects. State

statutes provide for voluntary solar and wind easements for energy devices. The PUC requires utilities to consider the full-cost for externalities in their evaluation of resource options.

RECENT DEVELOPMENTS

Wind on the Wires is a $4.5 million two-year project to develop renewable energy resources, with the goal of making Minnesota a world leader in developing this resource. The money will be used to overcome two hurdles: bottlenecks in the power grid and transmission systems rules.

Xcel chose Chanarambie Power Partners to generate wind energy from turbines along Buffalo Ridge in Minnesota. Chanarambie will build the wind farm and sell the power to Xcel for 20 years. Developers in North Dakota, South Dakota, and Iowa also submitted proposals for wind farms to supply Xcel.

In May 2001, Northern Alternative Energy raised about $110 million in private equity toward a $400 million-plus, 650-MW power project including about 130-MW from wind turbines. The project will include several natural gas peakers for dispersed generation in cities in Iowa, western Wisconsin and Minnesota. Navitas Energy, a unit of Northern Alternative Energy and Xcel have signed power purchase agreements for the output. Minnesota will receive the majority of the output, including 100-MW of wind energy.

IOWA

Iowa has a total installed capacity of 258-MW of wind energy. Enron has two facilities at Storm Lake (113-MW and 85-MW), and FPL Energy has a facility at Clear Lake (42-MW). In addition to the large utility-scale wind farms, Iowa has 40 small-scale, grid-connected wind systems.

UTILITY GREEN PRICING/GREEN MARKETING PROGRAMS

Cedar Falls Utilities: CFU has 1.5–MW of wind capacity. Since 1999, CFU has offered its customers the option of donating $2.50 each month to support the operation of three wind turbines installed by a consortium of seven municipal utilities. CFU owns two-thirds of the wind project and 700 of CFU's 16,000 residential customers, about 4 percent of the total, are participating in the program.

Alliant Energy: In June 2000, Alliant Energy announced plans to offer green power to residential customers in Iowa and Wisconsin. The *Second Nature* program allows customers to choose from 25 percent, 50 percent or 100 percent renewable power at a premium of 2.0¢/kWh. The 100 percent renewable option costs approximately $13 per month.

INCENTIVES, REGULATIONS AND POLICIES

A state law requiring utilities to obtain 2 percent of their electricity from renewable sources was implemented in 1998, and during 1998 and 1999, Iowa

installed 240-MW of new wind capacity. The Alternative Energy Law requires that investor-owned utilities purchase a combined total of 105-MW of generation from renewable and small-hydro sources.

Iowa offers tax exemptions, loans and grants to promote renewable energy.

Iowa Distributed Wind Generation Project (IDWGP) is a consortium of seven municipal utilities that believe restructuring legislation will include mandates for renewable generation resources. IDWGP supports the Wind Energy Electric Project, with a cost of $2.8 million, $1.3 million of which was funded by the Turbine Verification Program, a research project of the Department of Energy and EPRI.

RECENT DEVELOPMENTS

Spirit Lake School District has powered its elementary school with a 140-foot wind turbine since 1993. It now plans to build a 750-watt turbine to power the high school and middle school.

Enron Wind Corp. has 262 turbines in the world's largest wind farm in Iowa, while FPL Energy has installed 56 turbines in Iowa that sell 42-MW of power to electric utilities.

AWEA and other groups have called for an RPS of 10 percent by the year 2015 in Iowa.

COLORADO

Xcel owns a 21.6-MW wind facility located in Ponnequin, in northeastern Colorado.

Utilities in the state are very active on the retail side, with the largest IOU and many municipal utilities offering green pricing programs. Utilities in Colorado have also been relatively successful in obtaining commitments from corporate "champions" to purchase at least 15 percent of their energy from renewable resources.

UTILITY GREEN PRICING/GREEN MARKETING PROGRAMS

The largest IOU, the largest G&T, and numerous municipal utilities in Colorado offer green pricing products.

Xcel Energy: In 1997, Xcel (then Public Service Company of Colorado) introduced a green pricing program called *Windsource*. Customers purchase 100-kWh blocks of wind energy for $2.50 per month, or they can choose to receive their entire monthly consumption from wind energy. The wind energy is supplied from a new 20-MW wind project in northeastern Colorado. The program is fully subscribed with approximately 21,000 residential and 350 business customers. Xcel also supplies a total of 4.3-MW of wholesale wind capacity to Holy Cross, Colorado Springs, and Yampa Valley. Current plans call for Xcel to expand its *Windsource* supply by 35-MW over the next few years.

By the end of 2001, Xcel is expected to have more than 600-MW of total wind power on-line, making it one of the largest deliverers of wind power in the U. S. Based on information from the U.S. Energy Department, Xcel will supply about one-eighth of the nation's wind-generated electricity by the end of the 2001.

Ft. Collins Utilities, Longmont Power & Communications, Estes Park Light & Power and Loveland Water & Power: The municipal utilities in Ft. Collins, Longmont, Estes Park and Loveland offer green pricing at a 2.5¢/kWh premium. They buy wind from Platte River Power Authority's Medicine Bow, Wyoming wind site.

- Estes Park has 165-kW of wind power and offers it in 100-kWh blocks for residential customers and 500-kWh blocks for business customers.
- Fort Collins Utilities has 3.5-MW of wind capacity. Initially residential customers had to purchase all of their power from wind, with commercial customers buying wind power in 1,000-kWh blocks. In June 1999, the program was expanded and FCU committed to purchase the equivalent output of two and one-half additional turbines. Residential customers were also given the option to purchase 400-kWh blocks for an extra $10 per month. As of February 2000, 750 customers or about 2 percent of the customer base had subscribed.
- Longmont Power and Communications has 330-kW of wind capacity. Residential customers can buy 100-kWh blocks of wind energy for an extra $2.50 each month, and business customers can purchase 500-kWh blocks for $12.50 a month. Customer must commit to wind purchases for a minimum of one year. As of January 2000, 210 residential and 2 small commercial customers had subscribed.
- City of Loveland Water & Light has 165-kW of wind capacity. Residential and business customers can buy 100-kWh blocks for $2.50 per month. As of April 1999, 215 customers had signed up to purchase 416 blocks, fully subscribing the program.

Holy Cross Electric Association: Holy Cross buys 3-MW of wind power wholesale from Xcel and sells it at a 2.5¢/kWh premium. Customers purchase 100-kWh blocks of wind energy. As of February 2000, it had subscriptions for 5,200 blocks from 1,570 residential, commercial and municipal customers, representing 4 percent of its customer base.

Colorado Spring Utilities: Colorado Springs buys 1.0-MW of wind power wholesale from Xcel, and sells it to residential and commercial customers at a premium of $3.00 per100-kWh block. As of January 2000, approximately 1,200 customers or 1 percent of the base had signed up to purchase wind power.

Tri-State G&T: Tri-State, a wholesale supplier of electric power to over 40 rural electric systems in Colorado, Wyoming, Nebraska and New Mexico, provides a green power product to its members at a 2.5¢/kWh premium. Tri-State buys 1.6-MW of wind energy from Platte River Power Authority. Together the 14

participating co-ops have customer commitments to purchase approximately 2,200 blocks of wind energy.

Yampa Valley Electric Association: Yampa Valley has an agreement with Xcel to buy 300-kW of wind output. It offers its northwestern Colorado customers the ability to purchase 100-kWh blocks of wind power at a 3.0¢/kWh premium. Approximately 120 of the 15,000 customers (1 percent) participate in the program, purchasing 300 of the 700 blocks available.

INCENTIVES, REGULATIONS AND POLICIES

Colorado does not offer tax incentives for renewable energy systems, nor does the state have any legislative or regulatory policies supporting development of renewable energy. Under a 1997 executive order, Colorado began looking at requirements for state agencies to purchase electricity from renewable sources.

RECENT DEVELOPMENTS

In March 2001, the Colorado PUC ordered Xcel to add a large wind farm south of Lamar to its plans to increase capacity in Colorado, the first time the regulators had decided that a wind-power project should become part of the customer rate base. Enron Wind has bid to build the wind turbines for 162-MW project.

Xcel is adding 15 new turbines to the Ponnequin Wind Farm. The Ponnequin Wind facility reached its present count of 29 turbines incrementally at a cost of $29 million. The 15 new turbines will cost about $15 million more when they begin operation in August 2001. The new construction will add 10-MW of power production to the 20-MW now being generated. Presently, about 1,000 Coloradoans are on a wait list for purchasing wind power from the utility.

WYOMING

Wyoming is ranked seventh in terms of potential wind energy. It has five wind facilities for a total installed capacity of 90.6-MW. 41-MW of wind capacity are owned by PacifiCorp and Eugene Water and Electric Board, and 24.7-MW of capacity are owned by Xcel.

UTILITY GREEN PRICING/GREEN MARKETING PROGRAMS

Pacific Power (PacifiCorp): Pacific Power offers the *Blue Sky* program where customers can buy 100-kWh blocks of wind power for $2.95 per block per month. As of May 2001, over 5,400 customers were participating and buying more than 9,000 blocks of wind energy. The money is used to construct and operate wind turbines in Oregon, Washington, Wyoming, and Utah. The program is certified by Renew 2000.

INCENTIVES, REGULATIONS AND POLICIES

Wyoming does not offer tax incentives for renewable energy systems, nor does the state have any legislative or regulatory policies supporting development of renewable energy.

RECENT DEVELOPMENTS

Shell Renewables' U.S. wind energy operation, Shell WindEnergy Inc., has signed an agreement to acquire its first project with the purchase of the 50-MW Rock River I wind farm in Wyoming. The project, developed by SeaWest WindPower Inc., is the first step in achieving Shell Renewables' wind energy strategy by moving to commercial scale. The wind farm will be constructed over the summer and is scheduled to begin generating electricity in October 2001. All energy produced, and the emissions reduction credits, will be sold to PacifiCorp under a single 20-year power purchase agreement.

In July 2001, the Carbon County Planning Commission unanimously approved a special-use permit for Clipper Windpower LLC to build 14 turbines in Carbon County, Wyoming. The turbines will be capable of generating a combined 21-MW of energy.

KANSAS

Kansas ranks third nationally in terms of wind energy potential. According to the Energy Information Administration, it is one of four states with the most land near existing transmission lines that is suitable for wind energy development, making the state a leading candidate for utility-scale projects. Within the state there are 77 facilities operating with a total installed capacity of 2.9-MW. The largest is the 1.5-MW Western Resources facility.

Kansas is home to a voluntary consortium investigating site prospects for wind generation. Seven electric utilities are involved in a cooperative venture, the Kansas Electric Utilities Research Program, in which partners contribute a total of about $1 million per year for assessment of renewable energy resources and demonstration projects.

UTILITY GREEN PRICING/GREEN MARKETING PROGRAMS

Western Resources: The firm operates two 750-kW turbines for a total capacity of 1.5-MW. Its *Westar Wind* program charges a 5.0¢/kWh premium and sells in 100-kWh blocks with a one-year enrollment commitment.

WestPlains Energy (UtiliCorp United): WestPlains buys 225-kW of wind energy from Western Resources, and sells it to customers at a 5¢/kWh premium.

INCENTIVES, REGULATIONS AND POLICIES

The State Energy Program provides approximately $500,000 per year for development of renewable energy with awards of $10, 000 to $50,000 per project.

There are no state tax incentives and no legislative or regulatory policies supporting development of renewable energy sources.

RECENT DEVELOPMENTS

In June 2001, FPL Energy announced that it would build, own and operate a 110-MW wind project in Kansas and sell the output to UtiliCorp United. The wind farm will include 170 turbines in Gray County, in southwestern Kansas, and will supply power for UtiliCorp customers in Kansas and Missouri.

NORTH DAKOTA

North Dakota is the leading state in potential wind energy. Nearly all portions of the state are suitable for development. To date, 22 wind facilities with total installed capacity of less than 1-MW are operational in North Dakota. The largest wind project is a 200-kW facility at Scared Heart Monastery. Although North Dakota possesses a vast untapped resource, the fundamental hurdle will be developing transmission capacity to carry the power to out-of-state markets.

UTILITY GREEN PRICING/GREEN MARKETING PROGRAMS

Great River Energy: GRE owns a 2-MW wind project. It offers the *Wellspring Wind Renewable Energy Program* to its 29 member distribution co-ops in Minnesota. The power is supplied to distribution co-ops with a suggested price premium of 1.5¢/kWh. GRE is adding three turbines with half of the output dedicated to supplying Minnesota Power's green pricing program.

Minnkota Power Cooperative: Minnkota Power Cooperative, a generation and transmission cooperative operating in eastern North Dakota and northwestern Minnesota, offers its member distribution co-ops and municipals wind-generated power. Nine of 12 co-ops are participating in *Infinity Wind Energy*, where customers can purchase 100-kWh blocks of wind energy. The premium of 3.1 to 4.6¢/kWh varies by state. Minnkota will construct turbines as demand warrants. As of March 2000, about 500 customers or 1 percent of the eligible customers had signed up.

INCENTIVES, REGULATIONS AND POLICIES

North Dakota offers state tax credits and sales tax exemptions for wind projects. Legislation was recently passed that decreases the property tax value of wind turbines, exempts construction of large turbines from the state sales tax, and offers some investors income tax credits for wind turbine projects.

RECENT DEVELOPMENTS

In May 2001, a site was chosen for the first commercial wind turbine to be built in North Dakota. It will be owned and operated by Navitas Energy. Minnkota Power Company will buy the energy, which it will sell to customers at a surcharge of $3 per month per 100-kWh block of energy.

A retired rancher, Jim Seitz, is working with several European wind energy companies, assisting them in finding wind sites in North Dakota. He has nearly 390,000 acres of private land signed up as potential sites. Jay Haley, a Grand Forks wind energy consultant is encouraging communities to form committees to pursue wind development, 20 have done so.

Montana-Dakota Utilities (MDU) received permission from the Public Service Commission in June 2001 to offer a green power rate to its 70,000 customers. It expects to charge customers $4 per 100-kWh used. Customers would have to buy at least 2,200 blocks for the project to be feasible and MDU would buy the electricity from other suppliers.

SOUTH DAKOTA

South Dakota ranks fourth in terms of wind energy potential, and has developed 0.75-MW of wind energy.

UTILITY GREEN PRICING/GREEN MARKETING PROGRAMS

East River Electric Power Cooperative: East River is a wholesale power co-op serving 22 member distribution systems in South Dakota and Minnesota. Under its *Prairie Winds* program residential and commercial customers can buy 100-kWh bocks of wind energy for an additional $3.50 each month. It plans to develop a 1-MW project with Basin Electric if it receives commitments for 2,000 blocks.

INCENTIVES, REGULATIONS AND POLICIES

South Dakota offers local property tax exemptions for renewable energy systems. The state does not have any legislative or regulatory policies supporting development of renewable energy.

RECENT DEVELOPMENTS

Rosebud Sioux Tribe embarked on a pilot project in April 2001, to use wind-generated energy to power the Rosebud Casino and Quality Inn.

Rolling Thunder, a $3 billion wind-farm project planned for South Dakota is expected to generate 3,000-MW of electricity. The developer, Clipper Wind Power has proposed over 2,000 turbines located in five counties in central South Dakota to be completed in 2005. It would be 10 times the size of the wind farm considered to be the nation's largest, a 300-MW project on the border of Oregon and Washington.

A consortium of companies are considering a $19 billion project that would run a new electric line from Los Angeles to Chicago, build coal-fired power plants in Wyoming, Montana, and North Dakota, and built about 1,500 wind turbines across South Dakota. Each South Dakota county allowing the power line to be strung on poles along county roads would be assured of property taxes on $100 million worth of wind turbines.

Restrictions on corporate farming in South Dakota may stymie plans to make electricity with the wind. FPL Energy is concerned about a 1998 constitutional amendment adopted by state voters that casts uncertainty on the legal ability of non-farm corporations to lease farmland for wind turbines. Amendment E bars non-farm corporations and syndicates from owning or having any legal interest in farmland. The South Dakota Farm Bureau, the state Sheep Growers Association and several individuals who raise livestock are challenging the constitutional provision in federal court. Unsure how the amendment would affect agreements to use land for such things as power plants and electric lines, Montana-Dakota Utilities, Northwestern Public Service Co. and Otter Tail Power Co. also joined the lawsuit seeking to overturn the amendment. FPL Energy is concerned about the legality of leasing farmland for wind turbines. Despite concerns about the amendment, Clipper Windpower of California recently announced it had secured wind-energy easements from 83 landowners over a 22-mile stretch of the state. Erection of 133 wind turbines is expected to begin within the next year.

OKLAHOMA

In terms of wind energy potential, Oklahoma ranks 8th. The state has done little to capitalize on its wind resources, currently Oklahoma has four privately owned wind facilities with a total capacity of 0.2-MW.

UTILITY GREEN PRICING/GREEN MARKETING PROGRAMS

There are no utilities in Oklahoma offering green pricing programs at this time.

INCENTIVES, REGULATIONS AND POLICIES

Oklahoma does not offer tax incentives for renewable energy systems, nor does the state have any legislative or regulatory policies supporting development of renewable energy.

RECENT DEVELOPMENTS

A bill introduced in the U.S. House of Representatives in July 2001 would provide a tax credit for residential wind generators. Sponsored by Rep. J.C. Watts (R-OK), the Home and Farm Wind Energy Systems Act (HR 2322) would provide a 30 percent investment tax credit for the units. "We think it's a great way to create an energy alternative for homes, for farms and small businesses," says Watts, adding that "the current cost of residential wind turbines is hindering their sales. A tax incentive that lowers the up-front cost of the machines should boost sales, helping manufacturers to increase their volume and lower costs." "A typical 10 kilowatt residential wind turbine costs about $ 32,000 and takes about 15 years to pay for itself in terms of lowered electricity costs," says Mike Bergey, president of Bergey Windpower of Norman, Oklahoma, a leading small turbine manufacturer.

MISSOURI

Missouri has more limited wind energy potential than many of the nearby states, ranking 21st. The Ozark Plateau offers some opportunities for wind energy production, but the state has not made an effort to develop its wind resource.

UTILITY GREEN PRICING/GREEN MARKETING PROGRAMS

Missouri Public Service (UtiliCorp United): UtiliCorp buys 225-kW of wind capacity from Western Resources and markets to its Kansas WestPlains and Missouri Public Service customers at a 5.0¢/kWh premium.

INCENTIVES, REGULATIONS AND POLICIES

Missouri does not offer tax incentives or have regulatory policies promoting wind energy, but it offers a corporate tax credit for wood energy production, as well as low-interest loans for energy efficiency and renewable energy projects. It also has regulations granting solar easements.

RECENT DEVELOPMENTS

There have been no recent developments in Missouri regarding wind energy.

ARKANSAS

Arkansas ranks 28th in terms of wind potential and it has not made efforts to develop its wind resource.

UTILITY GREEN PRICING/GREEN MARKETING PROGRAMS

No utilities in Arkansas have offered green pricing or green marketing programs.

INCENTIVES, REGULATIONS AND POLICIES

The State offers corporate tax credits for bio-fuels, but does not have any legislative or regulatory policies supporting the development of wind energy.

RECENT DEVELOPMENTS

There have been no recent developments in Arkansas related to wind energy production.

FUTURE WIND PROJECTS

The following table illustrates the abundance of new wind projects that have been announced, are being planned, or are in the solicitation stage of development.

TABLE 2-6
PROPOSED OR PLANNED WIND PROJECTS BY STATE

State	Developer/Utility	Location	Status	Capacity (MW)	Completion Date
MN	Northern Alternative Energy Xcel Energy	TBD	Proposed	50	2001
	Xcel Energy	Buffalo Ridge	Bid accepted 7/2001	80	2002
	Great River Energy	Chandler Hills, Phase II	Proposed	1.98	2001
	Northern Alternative Energy	Southwest region of state	Proposed	0.9	2001
IA	Northern Iowa Wind Power (Top of Iowa Wind Farm)	Worth County	Proposed	80.1	2001
	FPL Energy	Hancock County	Proposed	98	2001
	Eldora – New Providence Schools	Hardin County	Proposed	.25	2001
	Orange County Municipal Utility	Sioux County	Proposed	.75	2001
	Top of Iowa II	TBD	Proposed	80.1	2002
CO	Xcel Energy	Ponnequin	Under development	10	2001
	Xcel Energy	Logan County	Bid accepted	26	2001
	Xcel Energy	Prowers County	Proposed	162	2002
WY	SeaWest Windpower/BPA (Foote Creek Rim – IV)	Carbon County	Under development	16.8	2001
KS	UtiliCorp United/ FLP Energy	Montezuma	Proposed	108.9	2001
ND	3 Affiliated Tribes for Fort Berthold	New Town	Under development	0.1	2001
SD	Rosebud Sioux	Rosebud	Under development	.75	2001
	Basin Electric, East River Electric/Crown Butte Wind Power LLC (Prairie Winds/ Energy in Motion)	Chamberlain	Proposed	1.3 – 3.9	2001

Source: AWEA, April, 2001

DEVELOPMENTS IN OTHER STATES

TEXAS

With an RPS in place and utilities preparing for deregulation in January 2002, there has been significant wind development activity in Texas. More than 700-MW of wind development is expected in the state in the next few years, where the state's RPS calls for 2000-MW of new renewable energy capacity by 2009.

- During pilot electric deregulation program Green Mountain Energy will offer 100 percent wind power in Texas. The fixed rate price will be 9.2 cents/kWh plus a $4.95 fee for customers in TXU and TNMP service territories. Houston-area residents served by Reliant Energy will pay 9.8¢/kWh plus the monthly fee.
- AEP has entered the Texas wind power generation market. Late in 2000 it joined with TXU Electric and Gas to announce a new 130-MW wind-power project in West Texas. The project will feature 87 wind turbines rated at 1.5-MW each.

CALIFORNIA

The 1997 deregulation law created state subsidies for renewable power, paid for by customers of the private utility companies. A total of $540 million was earmarked to support existing and new renewable energy projects from 1998 through 2001. AWEA projected that the wind price support payment would amount to approximately 1.0¢/kWh in 1998, falling to 0.88¢/kWh in 1999, 0.61¢ in 2000 and 0.44¢/kWh in 2001. Retail marketers who sell renewable-sourced power to end-use customers are eligible for a customer rebate of up to 1.5¢/kWh. The rebate is paid to the certified renewable marketers who are then required to reflect the credit in the customer's electric bill.

TENNESSEE

Tennessee Valley Authority has installed three turbines on a ridge west of Knoxville that can provide 2-MW of electricity. It plans to expand the wind program at least tenfold to 20-MW. The turbines currently provide about 60 percent of the power for TVA's Green Power Switch program, a renewable energy program with 3,600 residential customers. In July, TVA issued a request for proposals for a minimum of 20-MW of new wind generation to be built in the Tennessee Valley by 2003.

MONTANA

Montana Power sought proposals for 150-MW of wind power to diversify its supplies of energy by July 2002. It has begun negotiations with four companies and plans to make a final decision by mid-August.

In September 2000, the Blackfeet Tribal Business Council and SeaWest WindPower, Inc. signed a development agreement for the 22-MW Blackfeet I

Wind Power Project. This project will be the first utility-scale wind energy project built on tribal lands. The Blackfeet I project is scheduled to begin construction in May 2001, with commercial operation scheduled for October 2001. BPA may purchase the power from the project through a long-term power purchase agreement. Power will be made available to the BPA, Glacier Electric Cooperative, other Montana Co-op and Montana Power Company distribution customers.

ILLINOIS

Illinois expects its first large-scale wind farm in Mendota to be completed in 2001 and a second facility in Princeton to be operational in 2002. Combined, the two projects would generate 100-MW of wind power. The city of Chicago is requiring that companies bidding to supply 400-MW of electricity for city government facilities get 20 percent of the power from renewable sources.

NEW YORK

In June 2001, Governor Pataki issued an Executive Order requiring all agencies of New York State, including the New York City Metropolitan Transportation Authority, to purchase 10% of their electricity from renewable energy sources by 2005 and 20% by 2010. AWEA said the announcement will create the first stable, long-term markets for retail sales of wind energy in New York State, as well as boost solar PV and biomass energy sources.

State agencies and authorities in New York require approximately 630-MW of electric power. Pataki's initiative could result in approximately 165 million kWh per year of renewable energy sales to state agencies by 2005 and 330 million kWh by 2010.

Wind Power New York, a state-level initiative of AWEA, is campaigning for a series of legislative and policy goals, including:

- An RPS that would require a certain minimum percentage of all electricity sold in the state to come from renewable energy sources, with the percentage increasing over time; and
- A tax credit to lower the cost of a small wind turbine intended for household or small business use.

REGULATIONS AND PROGRAMS SUPPORTING WIND DEVELOPMENT

PRODUCTION TAX CREDIT

The Wind Energy Production Tax Credit (PTC) was enacted as part of the Energy Policy Act of 1992. It provides an inflation-adjusted 1.5-cent per kilowatt-hour credit for electricity produced with wind equipment for the first ten years of a project's life. The Credit is only available if the wind equipment is located in the

U.S. and electricity is generated and sold in the marketplace and it applies to facilities placed in service before January 1, 2002.

With current production cost of approximately 4.5/kWh, the 1.5 cents/kWh PTC stimulates new wind power development by assisting the industry in competing with fossil fuel generating sources, which based on historical averages cost approximately 3.0 cents/kWh.

President Bush's energy plan announced in May 2001 plans to seek approval to continue a tax credit for wind energy producers.

RENEWABLE PORTFOLIO STANDARD

The Renewable Portfolio Standard (RPS) is a market-driven policy that ensures that a minimum amount of renewable energy is included in the portfolio of electricity resources serving a state. Because it is a market standard, the RPS relies almost entirely on the private market for its implementation.

- In 1999 the Texas legislature approved an RPS requiring Texas utilities to install or buy 2,000-MW of new renewable generating capacity by January 2009.
- Both Enron Corp. and Reliant Energy, Inc. are voluntarily exceeding their state's mandates for integrating wind power into the mix they will offer under new rules calling for a competitive retail market. State law called for bringing 40-MW of new wind power online by the end of the year. Texas will add more than twice that – 90-MW.

  Reliant announced its involvement in two new renewable energy projects in August 2000. Reliant will purchase the output from a 208-MW wind power facility to be built in West Texas and a total of 44-MW of landfill methane generation. Although some of the energy will be sold into the grid to meet the state's RPS, Reliant also plans to market the power to rural electric cooperatives and other retail energy providers after the state's energy markets are restructured in 2002.
- Iowa has mandatory set-asides with the state's IOUs being required to purchase a minimum combined total of 105-MW of their generation from renewable sources. A total of 2% of power mix must come from renewable sources.
- In 1994, the Minnesota PUC mandated NSP (now Xcel Energy) to install 425-MW of wind power by the end of 2002.
- In addition to the states of Minnesota, Iowa, and Texas an RPS has been adopted by the legislatures or regulators in Arizona, Maine, Nevada, Connecticut, Massachusetts and New Jersey.

RENEWABLE ENERGY CREDITS AND TRADABLE RENEWABLE CERTIFICATES

Renewable Energy Credits (RECs) are the central focus of the RPS. An REC is a tradable certificate of proof that one kWh of electricity has been generated by a

renewable-fueled source. RECs are represented in kWh and are a separate commodity from the power itself. The RPS requires that electricity generators show, through ownership of RECs, that they have supported an amount of renewable energy generation equivalent to some percentage of their total annual kWh sales. Generators decide whether to invest in renewable energy projects and generate their own RECs, enter into long-term contracts to purchase RECs or renewable power along with RECs, or simply to purchase RECs on the spot market. The REC concept is modeled after the SO_2 credit-trading program established by the Clean Air Act. States setting an RPS probably can not limit qualifying renewable facilities to be located within its borders, however, it may require that renewable power be sold to buyers within the state in order to qualify for RECs.

A closely related concept is the renewable or green "tags" called tradable renewable certificates (TRCs) that could lower transaction costs while offering liquidity to the sale of renewable resources. TRCs are separated from the actual electricity flow, allowing a generator of renewable energy to sell the renewable aspect of that generation to anyone in the country. Examples of certificate programs include:

- ComEd and the Environmental Resources Trust (ERT) teamed up on April 2000 to offer the first wholesale renewable power product in Illinois. ComEd is selling the product, called *EcoPower* through the APX Midwest Market. Electricity suppliers purchase "green tickets" through the APX Market can use the *EcoPower* label in their retail marketing.
- PG&E National Energy Group *Pure Wind* certificates from its 11.5-MW Madison, New York project are sold though out the northeast. In November of 2000, PG&E announced plans to build a new 44-MW wind project in California from which the company will sell *Pure Wind* certificates representing the environmental attributes associated with each megawatt-hour of wind energy generated by the project. The 74-turbine project will be constructed in San Gorgonio Pass near Palm Springs with a planned completion date of Spring 2001. One Pure Wind^{sm} certificate represents the environmental attributes associated with 1-MWh of electricity, it includes avoided air emissions and avoided water emission, as wind-generated power is emission-free. Comparing the environmental attributes of wind-generated power to the environmental attributes of other types of generated power, one Pure Wind^{sm} Certificates represents a savings of 5 lbs. Sulphur Dioxide, (SO_2), 2 lbs. Nitrogen Oxide, (NOx), and 1000 lbs. Carbon Dioxide (CO_2) emissions when the comparison is based upon the average of all New York State power generation facilities.
- Bonneville Environmental Foundation (BEF) is an independent non-profit foundation that generates revenues from marketing environmentally preferred or green power to utilities and end use customers throughout the northwest US. TRCs are also being used by a few organizations that work

with business and industry to reduce their environmental footprint (Bonneville Environmental Foundation and Climate Neutral Network).

- LADWP through its "Green Power for a Green LA" program sells green power certificates as a mechanism for customers and non-customers alike to reduce pollution through green power purchases. The LADWP sells TRCs to whoever is interested.
- Waverly Light and Power, a municipal electric utility serving Waverly Iowa is selling wind power certificates representing the environmental attributes of the power output of its three wind turbines. Participants need not obtain electric service from WL&P in order to participate.
- Atlantic Renewable Energy Corp, Midwest Renewable Energy Corp., and Zilkha Renewable Energy (ZRE) sell wind energy certificates. The Top of Iowa Wind Farm, an 80-MW facility located on approximately 5,500 acres of cropland in western Worth County, Iowa is being developed by ZRE in partnership with Midwest Renewable Energy Corporation. ZRE is providing the capital required to build the project and will sell all of the electricity under a long-term power purchase agreement with Alliant Energy of Madison, Wisconsin. Under the PPA, ZRE will retain ownership of 50 percent of the Renewable Resource Credits (Green Credits).
- ComEd and the Environmental Resources Trust (ERT) offer wholesale renewable power in Illinois. ComEd is selling *EcoPower* through the APX Midwest Market. Retail suppliers who purchase "green tickets" through the APX Market are allowed to use the *EcoPower* label in their marketing.
- PG&E National Energy group sells TRCs from their New York wind farm throughout the northeast.

AUTOMATED POWER EXCHANGE

The Automated Power Exchange (APX) operates Internet-based markets for buying and selling renewable power. APX Green Power Markets allow renewable power to be traded first as commodity energy at normal market prices, and second as green or renewable tickets that represent the premium over and above the commodity price that buyers are willing to pay for the environmental benefits of this power. The tickets are sold in one-megawatt-hour increments. APX Green Power Markets help the industry meet the real-time end-user demand from renewable energy sources, such as geothermal, wind, solar, hydro, biomass, and landfill gas.

More than 25 organizations, including some of the largest organizations in the renewable energy business, use the APX Green Power Markets. For wholesale buying, these markets are open to utilities, energy service providers, load-serving entities, and power marketers. For wholesale selling, these markets are open to renewable generators.

The APX Green Power Markets help wholesale buyers assemble a diversified portfolio of renewable energy supplies -- without the need for specific bilateral contracts. They also give renewable generators the opportunity to sell to a larger number of buyers that are willing to pay a premium price for energy from environmentally preferred resources. Additionally, generators get a revenue benchmark needed to obtain financing for new renewable plants.

APX operates both a California and a Midwest market for green power. The table below shows the historical prices in the California market.

TABLE 2-3
APX CALIFORNIA GREEN POWER MARKET GREEN TICKET PRICES:
HISTORICAL GREEN TICKET PREMIUMS – YEAR 2000

Month	Monthly Average $/MWh	Monthly High $/MWh	Monthly Low $/MWh	Monthly Volume in MWh	Cumulative Volume Weighted Average $/MWh
Jan 2000	4.38	8.75	2.50	9,551	4.38
Feb 2000	3.90	6.00	3.00	14,600	4.09
Mar 2000	4.31	4.75	3.50	57,026	4.25
Apr 2000	3.28	3.50	0.50	19,816	4.23
May 2000	3.42	4.00	2.75	51,645	4.10
June 2000	3.35	4.80	2.00	202,897	3.98
July 2000	3.67	45.00	1.00	127,648	3.85
Aug 2000	2.88	4.75	0.12	26,350	3.82
Sept 2000	2.98	3.15	2.85	91,827	3.72
Oct 2000	2.41	3.75	2.20	65,120	3.68
Nov 2000	2.42	5.50	0.10	148,907	3.29
Dec 2000	2.54	6.50	2.35	43736	3.22
Jan 2001*	2.05	6.75	1.85	65,085	3.14
Feb 2001*	2.08	5.00	1.10	9,763	3.11
Mar 2001*	0.64	1.25	0.49	54,857	2.84

GREEN ENERGY CERTIFICATION

In order to realize the potential for green power and narrow the gap between what people say and what they do, consumers need education and information. Certification and endorsements are important for the green marketer, examples of certifications include *Green-e* and *Renew 2000*.

The Center of Resource Solutions administers the *Green-e Renewable Electricity Certification Program*. *Green-e* provides a convenient way for consumers to identify environmentally friendly electricity products in competitive markets. *Green-e* certifies renewable electricity products that meet certain environmental

standards and requires that provider disclosure information be provided in a standardized format.

Renew 2000 is a project that was started in 1997 by the Portland based environmental group Northwest Environmental Advocates. *Renew 2000* was conceived to facilitate utilities and environmentalists working together to build consumer demand for sustainable and environmentally preferred energy resources. *Renew 2000* developed certification standards to help consumers judge whether or not a particular energy product offered by their utility is better for the environment. Energy blocks offered to customers within the context of the certified green power marketing must include either 50-kWh or 50% new eligible renewable energy, whichever is greater.