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MINNESOTA'S RENEWABLE  
ENERGY STANDARDS:  
CREATING A STRATEGY TO  
MAXIMIZE ECONOMIC BENEFITS

(Per Minnesota Session Laws 2007,  
Chapter 107)

Submitted by:

Minnesota Department of Employment  
And Economic Development

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# **Minnesota's Renewable Energy Standards: Creating a Strategy to Maximize Economic Benefits (Per Minnesota Session Laws 2007, Chapter 107)**

## ***Background***

### **THE LEGISLATIVE MANDATE**

Minnesota Session Laws 2007, Chapter 107 mandates that the Minnesota Department of Employment and Economic Development (DEED), in cooperation with the Department of Commerce, the Department of Agriculture and the Public Utilities Commission, “develop a strategy to obtain the maximum economic benefit for the state and its citizens from the renewable energy activities prescribed by Minnesota Statutes, section 216B.1691,” as amended in 2007.

### **DEFINITION OF ECONOMIC BENEFIT**

This report defines “maximum economic benefit” as new capital investment and job growth in manufacturing, DEED’s traditional economic development goals. Both generate new tax revenue. Re-equipping and expanding of existing businesses is included in the definition of capital investment. And job growth includes additional employees in existing businesses. Therefore this strategy focuses on fostering the growth of existing businesses in Minnesota as well as attracting new businesses. In fact, those goals go hand in hand.

### **DEED’S MISSION**

The Minnesota Department of Employment and Economic Development supports the economic success of individuals, businesses and communities by improving opportunities for growth. The growth of the renewable energy industry prescribed by 2007 Minnesota Statute 216B.1691 will provide a platform for the kind of economic growth that is the goal of the agency.

### **MINNESOTA’S RENEWABLE ENERGY STANDARDS (RES) OF 2007**

Minnesota’s Renewable Energy Standards require that Xcel Energy, the state’s largest electric utility and the nation’s foremost provider of wind energy, sell at least 30 percent of its electricity from renewable fuels by 2020; 25 percent must come specifically from wind. All other utilities must achieve 25 percent of their sales from renewable fuels by 2025.

Except for Xcel Energy's wind mandate, the RES legislation leaves the choice of renewable fuels to the electric utilities. Some utilities, like Great River Energy and Minnesota Power, are planning to provide a portion of their renewable energy with biomass. But the utilities generally have indicated that wind power will make up the lion's share of their sales of electricity from renewable generation.

#### **FACTORS FAVORING DEVELOPMENT OF WIND POWER**

Some reasons for the primacy of wind power in Minnesota are environmental:

- Wind is an inexhaustible resource;
- Wind does not emit pollutants or CO<sub>2</sub>;
- Wind has a relatively small environmental footprint.

Some are economic:

- Wind is free fuel;
- Even considering capital costs, wind is cheaper than other renewable fuels;
- Minnesota lies near North Dakota and South Dakota, states with high wind potential.

Some are technical:

- Wind power is an established, proven technology;
- Turbines are specific, identifiable manufactured products with a predictable cost/benefit ratio.

#### **MARKET IMPLICATIONS OF THE RES**

To meet its requirements under the RES, Xcel Energy plans to increase its wind capacity from the present 1100 megawatts (MWs) to as much as 3700 MWs by 2020, a net increase of 2600 MWs. If the capacity of the average turbine is 2 MW, and its installed cost is \$2 million per MW, Xcel would have to buy (or have their private developers/suppliers buy) 1300 turbines at a cost of \$5.2 billion.

Collectively, the rest of Minnesota's utilities may need to add at least as much wind energy as Xcel. Unlike Xcel, which already obtains four percent of its power from wind, the other utilities have less than one percent. If they only equal Xcel's investment, the wind turbine market *just for Minnesota* will total more than \$10 billion. To add to that, 25 other states have adopted renewable energy standards and the U.S. Congress is debating a national standard.

#### **FACTORS FAVORING A JOB-CREATION STRATEGY BASED ON WIND TURBINES**

- Wind is the overwhelming choice of utilities working to meet Renewable Portfolio Standards;
- Utilities nationwide are shopping for turbines;
- The demand for turbines in 25 other states that have passed Renewable Energy Standards or Renewable Portfolio Standards, and the further demand driven by expected federal standards, ensure the long-term growth of the industry;

- The capacity of the global turbine industry is not sufficient to meet demand;
- Turbines are in short supply, with deliveries stretching out to two to three years;
- Wind turbine prices are increasing sharply;
- Turbines are made mostly in foreign countries that have expensive currencies, high manufacturing costs and expensive shipping;
- The world's nine significant manufacturers of utility-scale turbines are easy to target.

### ***Minnesota's Short-term Strategy for Economic Benefit***

Minnesota's short-term strategy grew out of a trip a number of Minnesota organizations and state agencies made last June to an annual convention of the American Wind Energy Association (AWEA) in Los Angeles. (AWEA will hold its 2009 convention in Minneapolis.) The Minnesotans met face-to-face with every one of the world's nine utility-scale turbine manufacturers. When asked what it would take to make them build a plant in Minnesota, every manufacturer gave the same reply: "Do you have a supply chain?"

That is a critical question. Wind turbine original equipment manufacturers (OEMs) are not integrated. They assemble components purchased from suppliers of subassemblies. Therefore, much of the multi-million dollar cost of a wind turbine goes ultimately into the pockets of suppliers and their workers.

Our strategy of identifying, informing and promoting Minnesota's supply-chain thus promises two benefits: (1) it will help us attract OEMs; and (2) even if we do not succeed in the first endeavor, a well organized supply chain in Minnesota will be able to sell to OEMs that are springing up in the Midwest. Already two Minnesota companies are selling large components to two turbine manufacturers in Iowa. Iowa's gain is not necessarily Minnesota's loss. (Since arriving at the supply-chain strategy, we have found that Michigan and the United Kingdom are pursuing similar strategies.)

#### **TACTICAL IMPLEMENTATION OF THE SUPPLY-CHAIN STRATEGY**

State agencies have copious data on labor, sites, programs, and communities, but data on the supply chain specific to wind turbines was difficult to find. Fortunately, a study was found that spelled out twelve NAICS codes for suppliers of all the various items that make up a wind turbine. Since companies in those twelve classifications currently make components for industries other than wind turbines, some need to become aware that they are equipped to serve this burgeoning new multibillion-dollar market. Others may be aware of the market but are not sure how to approach it. So last August DEED began a series of regional meetings to inform appropriately equipped companies about the industry, and to suggest ways to become suppliers to it. By mid-December we will have held twelve meetings throughout Minnesota.

The audience at each of these meetings sees a PowerPoint overview of the wind power industry, hears a description of the kinds of components called for, and listens to a speaker from a large Minnesota manufacturing company that currently sells into the turbine industry. The companies in the audience are unlikely to dedicate themselves totally to the turbine industry. Most prefer to diversify among several industries. But the wind industry gives them an interesting new platform for growth.

The meetings make the suppliers aware of the OEM industry. But they also can make OEMs aware of the suppliers. DEED will post on State of Minnesota websites a database of Minnesota suppliers who have attended meetings or otherwise indicated their interest in wind turbines. The meetings wind up in December, and the database will be online by February.

### ***Toward a Long-term Economic Benefit Strategy: Wind Power***

#### **ATTRACTING AN OEM TURBINE MANUFACTURER**

If Minnesota succeeds only in helping Minnesota suppliers break into the national turbine industry, its efforts will be justified. But the long-term goal is the creation of a complete turbine industry in Minnesota, including nameplate manufacturers. Iowa's aggressive, well funded marketing effort demonstrates how effective a determined state initiative can be. Iowa already has landed two OEMs and a number of ancillary companies making blades and towers. Governor Chet Culver has declared that more are on the way.

OEM manufacturing is the prize. It provides a nearby market for component suppliers, and a marketing vehicle for the state. When other European turbine manufacturers see competitors thrive in Minnesota, they are likely to follow them here. Minnesota will pursue OEMs by calling on company headquarters, displaying at industry shows, and advertising in industry journals. Attached is a promotional piece produced in-house at DEED for distribution at trade shows.

#### **INDUSTRY ADVISORY COUNCIL**

DEED is forming a wind industry advisory council made up of suppliers, wind developers, engineers, educators, association officers, transportation executives, and others engaged in the wind power industry. The council will meet quarterly beginning in January.

#### **WIND ENERGY INSTITUTE**

State agencies are discussing with a Minnesota university and the MnSCU system the creation of an institute to train engineers and production workers for the wind industry and raise Minnesota's profile in the world industry by hosting international conferences and engineering research.

**STRATEGIC PARTNERSHIPS**

The State's strategic partnerships include diverse categories. All of the following organizations have been consulted in the course of developing the strategy:

## Utilities:

- Xcel Energy
- Minnesota Power
- Great River Energy
- Ottertail Power

## Industrial associations:

- Minnesota Precision Manufacturers
- Arrowhead Manufacturers and Fabricators
- Tri-State Manufacturers
- Highway Two Manufacturers
- Steelworkers Union
- American Wind Energy Association

## State agencies:

- Department of Commerce
- Department of Natural Resources
- Department of Agriculture

## Educational institutions:

- University of Minnesota
- University of St. Thomas
- MnSCU

## Foundations:

- Central Minnesota Initiative Foundation
- Southern Minnesota Initiative Foundation
- The Blandin Foundation

## Environmental organizations:

- Wind on the Wires
- Windustry
- Minnesota Center for Energy and Environment

## Economic development organizations:

- Apex of Duluth
- St. Paul Port Authority
- Mayors' Initiative on Green Manufacturing

## Wind farm developers:

- John Ihle
- Dan Juhl
- Paul White

### *Toward a Long-term Economic Benefit Strategy: Biomass Energy*

Minnesota and nearby states are rich in wind potential, but Minnesota is uniquely positioned to develop biomass power as well. In northeastern Minnesota's boreal forest, the forest products industry and the loggers who supply it generate wood wastes that can be used to fuel power plants. In southern and western Minnesota, agricultural wastes provide another rich energy resource.

Minnesota has seen extensive biomass development in biofuels like ethanol and biodiesel. But biomass can play a role in power generation as well. A DEED staff member recently participated in a study of Minnesota's biomass power potential which found little feasibility in stand-alone biomass power plants (most of the ones built in California now are shuttered), but the study suggests that co-generating power as a sideline to a core business can add significantly to Minnesota's renewable power supply.

For example, virgin paper mills, of which we have five in northeastern Minnesota, usually generate much of their own power with waste; one Minnesota mill, Sappi in Cloquet, is virtually self-sufficient in electricity. By generating their own power, paper mills contribute to our energy economy by displacing megawatts from the grid. But recent studies by a University of Minnesota graduate now on Princeton's faculty, Eric Larson, demonstrate that technical advances can turn paper mills into exporting power plants. Minnesota Power is working with paper mill customers to develop their power resources.

Forest products plants might also enhance the operations of the ethanol industry in southern Minnesota. Through enzymic processes, mills might be able to turn their wastes into feedstocks for cellulosic ethanol, a possibility that the University of Minnesota is pursuing. An ethanol plant in Little Falls is fueling a gasifier with wood waste from a nearby lumber mill to eliminate its use of natural gas and enable it to sell surplus electricity to Xcel Energy.

#### **TURNING TECHNICAL DEVELOPMENT INTO ECONOMIC DEVELOPMENT**

So many intriguing developments are emerging in biomass energy that it may be premature to decide which will be economically successful. At the moment, co-generation looks like the best bet. But co-generation has to be engineered carefully into the scheme of each host facility; every co-generation project is unique. Designing an economic development strategy to address a disparate assortment of situations is a challenge.

But three basic steps can maximize biomass power co-generation in Minnesota:

- identifying every plant in the state that has potential to co-generate;
- helping each of those plants develop a co-generation plan; and
- coordinating incentives and financing to help them implement their plans.

A model for the organization to accomplish the first two tasks might be the modest but highly successful Minnesota Technical Assistance Program led by Cindy McComas in the Minnesota Pollution Control Agency. MnTAP seeks to reduce pollution by working with businesses on process improvements that prevent pollutants from being generated in the first place. Often these process improvements reduce costs as well as pollution. MnTAP's staff of engineers with expertise in specific industries is the key to its success. Development of co-generation will need the same kind of expert, one-on-one assistance.

## **RECOMMENDATIONS FOR FUTURE CONSIDERATION**

### **1. Local Content Preference**

Stockholders, ratepayers and the PUC demand that utilities award purchase agreements to the lowest bidders. Just as preferential rules allow an advantage to minority suppliers for government projects, a limited provision for local content could encourage the development of Minnesota's renewable energy manufacturing industry. DEED intends to study existing models of this concept and provide recommendations for this provision.

### **2. Marketing**

Minnesota traditionally has focused its economic development efforts on the retention and expansion of existing businesses and the creation of new enterprises. However, the state is beginning to take a closer look at a third approach critical to any economic development plan: business attraction. Wind energy is already a part of DEED's business development strategy. A similar effort is underway with the bioscience industry; the state has taken a more deliberate approach to business development and engaged with several organizations and communities to promote the state to a targeted audience. Renewable energy could very easily become a greater part of DEED's marketing efforts and is already integrated into the state's overall marketing plan. DEED currently has a renewable energy specialist and within the SEED initiative, the Governor has proposed \$200,000 for economic development marketing focusing primarily on the renewable energy industry.

### **3. Consortium of Higher Education Institutions**

A consortium of institutions should be formed to support research and the training of workers in the renewable energy industry. Several institutions within the region should be convened to build a global presence in the development, commercialization and servicing of renewable energy technologies in an interdisciplinary approach.

**CONCLUSION: GRASSROOTS STRATEGIES FOR WIND AND BIOMASS**

The strategies to leverage wind and biomass energy for job creation deal with very different opportunities, but they both promote the internal growth of Minnesota's established industries. Even the pursuit of foreign OEM turbine manufacturers is in the interest of solidifying Minnesota's existing supply-chain base. Just as it is easier in business to keep an existing customer than it is to attract a new one, it is easier in economic development to build on an existing industry than it is to create a new one.

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