

# **Executive Summary**

## Wind Power and the Iowa Economy

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A report for

### **The Iowa Policy Project**

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## Wind Power and the Iowa Economy

By David Osterberg and Elaine Ditsler

Wind blowing across the Midwest has enormous potential for producing electricity and a “new economy.” Iowa, the 10<sup>th</sup>-windiest state in the nation, is the third-largest producer of wind power in the United States.<sup>1,2</sup> According to the Iowa Department of Natural Resources, Iowa wind has the potential to produce more than 4.8 times the state’s own energy consumption annually, and about 5.2 percent of total U.S. energy consumption.<sup>3</sup>

There are over 400 wind turbines in Iowa with a total capacity of 425 megawatts (MW), and an additional 43 MW being installed this year. These wind turbines provide enough power to generate electricity for 130,000 homes per year and reduce carbon dioxide emissions by more than 1.3 million tons annually. Eight school districts in Iowa have saved thousands of dollars by constructing wind turbines to provide electricity to their school buildings.

Iowa has four large wind farms, the most recent of which was constructed in 2003 in Hancock County by FPL Energy. Construction of the 148 turbines, each about 213 feet tall, was completed in only 85 days and will provide renewable power to Alliant Energy. MidAmerican Energy, Iowa’s largest electric utility, has pledged to build a \$325 million, 310-MW wind farm with 200 turbines in northern Iowa.<sup>4</sup>

In this report, the Iowa Policy Project answers the following questions: Should Iowa, as a matter of public policy, demand and/or support more investment in wind power? And if so, which types of policies are appropriate?

### United States Slow to Adopt Wind Power

According to the American Wind Energy Association (AWEA) and the European Wind Energy Association (EWEA), generating capacity from wind power increased by 28 percent worldwide during 2002. Nearly 7,000 MW of new wind capacity was installed last year, bringing the total to over 31,000 MW worldwide. This capacity is the equivalent of 31 average-sized nuclear power plants, and enough to supply 7.5 million average American homes. The high growth rate for 2002 was not unusual – the average annual growth in wind-energy capacity over the last five years has been 32 percent.<sup>5</sup>

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<sup>1</sup> Iowa Department of Natural Resources. 2002.

<sup>2</sup> D.L. Elliott and M.N.Schwartz, *Wind Energy Potential in the United States*. Richland, WA: Pacific Northwest Laboratory; September 1993.

<sup>3</sup> Iowa Department of Natural Resources calculation from *Wind Energy Potential in the United States* (see note 2).

<sup>4</sup> [www.midamericanenergy.com/newsroom/asp/newsdetails.asp?id=196&nav=1](http://www.midamericanenergy.com/newsroom/asp/newsdetails.asp?id=196&nav=1).

<sup>5</sup> [www.awea.org/news/news030303gbl.html](http://www.awea.org/news/news030303gbl.html)

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Wind-produced electricity is a viable industry in Europe, the United States and around the world. The global power industry already adds more wind capacity each year than it does nuclear, and will soon be adding more wind than hydropower.<sup>6</sup> As Table 1 shows, the U.S. produces less electricity from wind than some much smaller European nations. This is not for a lack of capacity or cost-competitiveness in the U.S. According to new research, 25 percent of the United States has sufficient winds to generate electricity as cheaply as natural gas or coal, and wind could reliably provide 30 percent of the power in the U.S.<sup>7</sup> In fact, Iowa has five times the wind-energy potential of Germany, the world's leader in wind-energy production.

### Wind Power Prices

Since 1980, the cost of wind power has fallen by 80 to 90 percent. With the federal production tax credit (PTC), wind power is cheaper than any other new energy source. Without the PTC, wind power still costs less than new coal, hydropower and nuclear. Wind power also offers added value to customers by providing long-term price stability because it is immune to changes in fuel prices.

MidAmerican Energy recently announced plans to build the world's largest land-based wind farm in Iowa and to freeze electric rates through 2010. MidAmerican president Greg Abel told reporters that "this project will bring additional renewable energy to Iowans while extending rate stability for our customers."<sup>8</sup> The long-term price stability of wind power stands in stark contrast to the volatility of natural gas prices. In June 2003, natural gas prices in Iowa were double the average price of one year earlier, and state regulators are warning of likely increases of over 100 percent in the winter of 2004.<sup>9</sup>

The competitiveness of wind power increases substantially when the environmental costs of traditional energy generation are recognized. Wind produces none of the health- and environment-damaging emissions from coal and gas power plants. Wind also requires no drilling or mining, or processing or shipping of fuel.

**Table 1. Global Wind Energy Generating Capacity by Country**

Country	2002 Additions (in MW)	2002 Year-End Total (in MW)
United States	410	4,685
Canada	40	238
North America	450	4,923
Germany	3,247	12,001
Spain	1,493	4,830
Denmark	497	2,880
Italy	103	785
Netherlands	217	688
United Kingdom	87	552
Sweden	35	328
Greece	4	276
Portugal	63	194
France	52	145
Austria	45	139
Ireland	13	137
Belgium	12	44
Finland	2	41
Luxembourg	1	16
EU Total	5,871	23,056
World Total	6,868	31,128

Source: American Wind Energy Association, [www.awea.org/news/news030303gbl.html](http://www.awea.org/news/news030303gbl.html)

<sup>6</sup> [www.greenbiz.com/news/news\\_third.cfm?NewsID=25424](http://www.greenbiz.com/news/news_third.cfm?NewsID=25424)

<sup>7</sup> [www.greenbiz.com/news/reviews\\_third.cfm?NewsID=25323](http://www.greenbiz.com/news/reviews_third.cfm?NewsID=25323)

<sup>8</sup> [www.midamericanenergy.com/newsroom/asp/newsdetails.asp?id=196&nav=1](http://www.midamericanenergy.com/newsroom/asp/newsdetails.asp?id=196&nav=1)

<sup>9</sup> Iowa Utilities Board, "Natural Gas Price Volatility," June 2003, [www.state.ia.us/government/com/util/Misc/2003WinterPrices.pdf](http://www.state.ia.us/government/com/util/Misc/2003WinterPrices.pdf)

## **The Economic Impact of Wind Power**

Wind power offers a natural opportunity for Iowa to break into a high-growth industrial sector and boost rural-county economies, while stemming the flow of Iowans' energy spending out of the state for natural gas and coal. Two Iowa Policy Project reports document wind power's local economic benefits. One study demonstrated that while wind power does not generate large numbers of jobs, it generates slightly more jobs and more sales when compared to traditional utilities.<sup>10</sup> The other study noted that wage rates for the new, permanent wind-energy jobs place these jobs in the 80<sup>th</sup> percentile (20 percent of all workers earn more, 80 percent earn less).<sup>11</sup> These are the kind of jobs Iowa must add if it is to break out of its low-wage status. Some of these jobs will be created in rural counties where the wind turbines will be located.

The 80 MW Top of Iowa I wind farm in Worth County created 200 construction jobs. A Lincoln County, Minnesota, wind farm created 150 such jobs for a 107 MW farm. These are not full-year jobs, because wind farms can be built so quickly. Engineering, insurance, manufacturing and financial firms also stand to benefit from a wind-power industry.

In rural Iowa, wind farms would provide a badly needed economic stimulus for declining communities, as well as a boost to Iowa farmers and landowners. An Iowa farmer receives an annual lease payment of between \$2,000 and \$4,500 for each turbine, which takes only about a half-acre of land and still allows for planting right up to the base of the tower. Landowners also can negotiate for a share of revenues instead of a lease, or construct their own wind turbines. Finally, wind turbines generate more than just electricity, jobs and income. They generate property, sales, use, excise and income taxes to fund public services.

## **Small-Scale Generation**

Distributed generation (DG) refers to small-scale power generation technologies located close to a dedicated load (the home or business where the electricity is used).<sup>12</sup> Distributed power systems provide an alternative to the traditional electric power system. DG technologies are highly reliable, efficient and clean; wind turbines, photovoltaics and fuel cells are all examples. DG systems are scarce in Iowa and the U.S., but the August 14, 2003, blackout has exposed the need for such small-scale, non-centrally located systems to be integrated into the energy grid. DG cannot stop a blackout once under way, but it lowers peak demand on the electric transmission system and reduces the risk of system failures. A net-metering law in Iowa allows "consumer-producers" to sell excess energy produced back to the grid. This law is the first step toward encouraging small-scale generation.

Schools offer one place to show off the benefits of using wind turbines for distributed generation, and districts are reaping both educational and financial rewards. As an example, the Spirit Lake School District, one of eight Iowa school districts with a wind turbine, is 100 percent powered by two wind turbines. The district paid off its first turbine in four years through electricity cost savings (\$25,000 per year). When its second turbine is paid off in 2007, the district

<sup>10</sup> David Swenson & Liesl Eathington, *Statewide Economic Values of Alternative Energy Sources and Energy Conservation*, March 2002.

<sup>11</sup> Matthew D. Ritsema, Mark A. Edelman & Daniel M. Otto, *Renewable Power and Energy Efficiency: Policies in Iowa and Other States*, April 2003.

<sup>12</sup> Small-scale generation without a dedicated load is called dispersed generation.

projects tax-free revenues of \$120,000 each year to spend on educational programs instead of energy. While financing is available for schools through state programs, districts have been slow to opt to save money by installing wind turbines due to a lack of information and technical know-how. Only one full-time state contractor performs outreach and consulting for all Iowa schools.

### Progressive Public Policies Started the Wind Industry in Iowa

Progressive energy policy in Iowa dates back to the 1983 Iowa Alternative Energy Production (AEP) Statute, which required investor-owned utilities to purchase electricity produced in its service territory by a facility that uses alternative power at a price equal to what the utility would pay for its own new conventional power plant. Further legislation and a vast improvement in renewable energy technology led to the building of two large wind farms with 240 MW of capacity near Storm Lake and Clear Lake.

States use both requirements and incentives to encourage more use of renewable energy. A requirement that electricity sellers obtain a certain amount of renewable-produced electricity is known as a Renewable Portfolio Standard or Renewable Energy Standard (RES). Thirteen states, including Iowa, now have renewable energy requirements. Iowa's RES of 2 percent has helped make Iowa the third-largest producer of wind power, ranking it behind only California, the state where the new wind industry began in the 1980s, and Texas, a state with a stronger renewable energy standard. However, Iowa's 2 percent RES is low relative to other states and Minnesota will soon surpass Iowa as the third-largest producer of wind energy. Minnesota is requiring its largest utility to acquire at least 10 percent of its electricity from renewable energy by 2015. Iowa needs to "raise the bar" in order to maintain its position as a national leader in wind power.

In addition to legislative requirements, states have established other incentives to encourage the development of wind energy. Minnesota, for example, offers a payment of 1.5 cents per kilowatt-hour for electricity generated by new, small-scale (less than 2 MW in capacity) wind-energy projects for the first 10 years of operation. This incentive has led to 88.5 MW of capacity as of June 2003. In Illinois, grants for wind projects are funded by a 2.5-cents per customer monthly fee on gas and electric bills. Kansas, Minnesota, Illinois, North Dakota and Iowa provide property- and sales-tax incentives for small renewable energy facilities. An Iowa loan program provides 0 percent loans for half of the financed project cost (up to \$250,000) for wind-energy production facilities in Iowa.

Legislative initiatives are primarily responsible for establishing long-term markets to facilitate the development of wind energy. Innovative energy policy also has generated consumer interest in buying green energy from the marketplace and persuaded utilities to use more renewable power sources to meet that demand. As a result of public policy, technology has advanced and wind power has become more cost-competitive.

## Policy Recommendations

Iowa's energy choices have never been more clear: Wind-produced electricity is good for the state's economy and the environment. Iowa is a national leader in wind energy, but is falling behind because of outdated public policies. In 2001, the Governor's Energy Policy Task Force recommended, and Governor Vilsack supported, a state goal of 1,000 MW of electricity from renewable sources by 2010. Keeping that goal in mind, we recommend the following policies to stimulate growth of a new economic sector in Iowa: wind-produced electricity.

### ■ Increase the Renewable Energy Standard (RES) in Iowa.

Iowa should increase its RES (Iowa Code 476.42) and make it apply to all utilities, not just investor-owned utilities. Every utility should be required to increase the percentage of renewable energy in its generation mix by an amount equal to 1 percent of its total Iowa retail sales each year until the standard reaches 15 percent. Electricity produced or purchased under this law could not also be credited toward a similar requirement in any other state. The 15 percent requirement is reasonable (and easily attainable) given Iowa's tremendous renewable energy potential and the benefits that all Iowans stand to gain from the development of this new industry.

### ■ Tie State Purchases to the RES.

Starting in 2004, the state government should commit to purchase 10 percent of all electricity used from renewable sources or to produce this amount of renewable energy. In 2010, this commitment should increase to 15 percent. By purchasing the energy, the state government provides a market for renewable energy produced as a result of the higher RES.

### ■ Help Community School Districts Produce Wind Energy.

An excellent way to spur the development of a market for wind energy in Iowa would be to help Iowa community school districts to purchase and install wind generators. We recommend that a portion of the Iowa Values Fund be used for \$100,000 grants to school districts that install wind turbines of at least 500 kilowatts in size. We further recommend that the Legislature increase the number of staff at the Iowa DNR who advise school districts on renewable energy.

### ■ Provide State Funds for Small Wind Power Projects (Distributed Generation).

The Iowa Values Fund should provide a seed grant program for small-scale wind projects of 2 MW or less – the size limited to 2 MW in order to promote distributed renewable energy systems, and to recognize large systems already are economical. Distributed generation fosters local ownership of wind resources and increases the reliability and efficiency of the energy grid. Applicants could receive 25 percent of the cost of constructing a renewable energy system up to a limit of \$100,000. The Iowa Energy Center could manage the grant program, which also may provide matching funds for federal grants and loans available in the latest farm bill.

## The Iowa Policy Project

For the full report, see  
[www.iowapolicyproject.org](http://www.iowapolicyproject.org)

The Iowa Policy Project was founded in the summer of 2000 to produce and disseminate research on a broad set of issues of importance to the citizens of Iowa. We are a non-profit and non-partisan organization. We engage scholars to produce sound, independent research.