



# The Iowa Policy Project

20 E. Market St. • Iowa City, Iowa 52245 • (319) 338-0773  
www.IowaPolicyProject.org

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## Think Wind Power, Think 'Iowa' Iowa Ranks Among World Leaders

By David Osterberg and Teresa Galluzzo

Denmark comes to people's lips when they speak of wind power prowess; "Iowa" should as well. Iowa wind turbines now produce as much as 20 percent of the state's total electricity, a benchmark Denmark reached a few years ago. Commissioner Darrell Hanson of the Iowa Utilities Board (IUB) — Iowa's electric industry regulator — explains the calculations for Iowa's record-breaking wind production:

*IUB staff currently estimate 17 to 20 percent of all electricity generated in Iowa now comes from wind. This is based on the following assumptions for Iowa: 3,670 megawatts of installed wind capacity; a 33.3 percent average wind capacity factor; and approximately 53 million megawatt hours of total electricity generation in 2008.<sup>1</sup>*

### How Many Homes Are Served?

Over the last decade, Iowa has become one of the dominant players in U.S. wind production, ranking second only to Texas in megawatts of capacity.<sup>2</sup> Considered in terms of per capita production, Iowa would be far ahead of Texas. In the last two years, Iowa added 2,500 megawatts of wind turbine capacity, which explains the thousands of long blades and tubular towers traveling state highways.

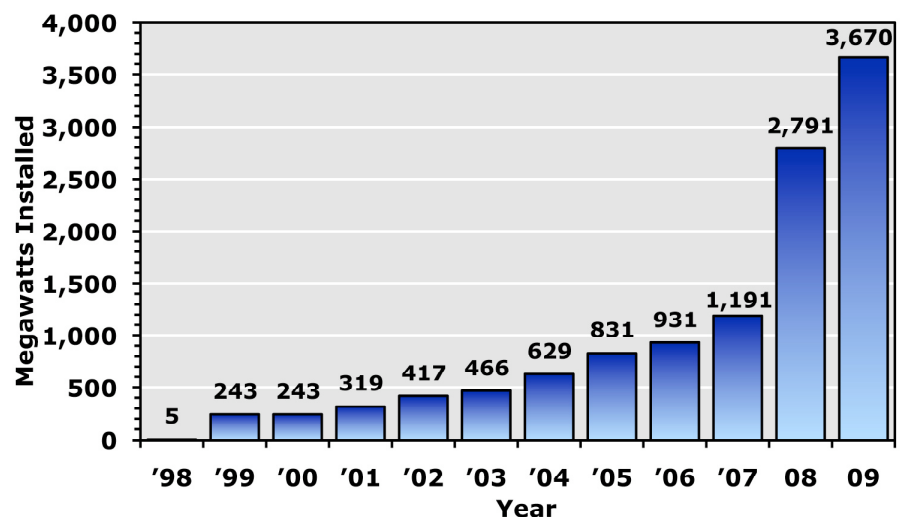
Iowa's wind capacity is nearly six times the size of Iowa's lone nuclear plant. Although we do not have information on where the wind electricity we produce is consumed, our total wind-powered generation is enough to serve the electric needs of 940,000 residences: nearly 75 percent of Iowa homes.<sup>3</sup>

### Electric Capacity Vs. Electricity Production

Since a wind power plant cannot produce electricity when the wind does not blow, the capacity of wind turbines is large in relation to production. Iowa has about 7,500 megawatts of coal-

powered electric plants, which produced about 75 percent of the state's electricity in 2007.<sup>4</sup> In contrast, 3,670 megawatts of wind turbines are necessary to produce 17 to 20 percent of Iowa's electricity.

Wind Power Growing Rapidly in Iowa



Data from 2001-2009 from American Wind Energy Association.  
Data from 1998-2000 from Iowa Energy Center.

## Economic Impact

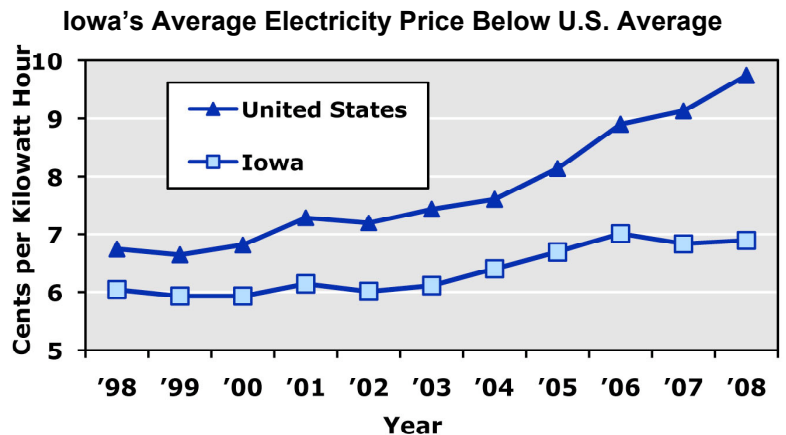
Wind turbine-related companies have been popping up in Iowa along with turbines. In addition to revenue, these companies create jobs in Iowa. This is very important considering that Iowa lost nearly 20,000 manufacturing jobs in 2009.<sup>5</sup> Iowa Governor Chet Culver often takes credit for this area of manufacturing prowess:

*I believe what is good for the environment can be, and should be good for the economy and for job creation. This is an industry which barely existed a generation ago; but now, nine international companies have made Iowa their home, producing towers, turbines and blades, and more than 200 Iowa-based businesses are in the supply chain.<sup>6</sup>*

## Prices Have Not Increased

One of the most common arguments for not addressing climate change and reducing greenhouse gas pollution is that the solutions are cost-prohibitive. However, amidst Iowa's massive expansion of wind power, our average electricity prices have remained below the national average and in fact have not increased as quickly as the national average price in the last four years (2005 to 2008).<sup>7</sup>

Discussion of prices for Iowa electric consumers must be qualified since the data presented are for the estimate of wind energy *produced*, not wind-powered electricity *consumed* in Iowa. The percent of wind power consumed in Iowa cannot be estimated because information is unavailable on what portion of electricity from each utility fuel source serves retail load and what is sold on the wholesale market. Further, selling at wholesale as well as producing for retail has benefits for ratepayers.



States surrounding Iowa require various percentages of electricity be from renewable sources under renewable energy standards. Since Iowa had the nation's first renewable energy standard,<sup>8</sup> which has long been surpassed, and is estimated to be the seventh windiest state in the nation,<sup>9</sup> it is certainly shipping wind-produced electricity out of state. This also has some effect on Iowa's low rates in the face of wind capacity additions. Regardless, the fact remains that Iowa has increased its wind power capacity primarily through efforts of one of its two investor-owned electric utilities, MidAmerican Energy, while that utility has been under a revenue freeze.

## What Iowa's Leading Wind Power Producer Says

We can look closer at MidAmerican Energy, one of the nation's most ambitious wind-power producers, for an assessment of the relationship between the expansion of wind-generated electricity and electricity prices. The company's website reinforces our findings on the cost of clean energy with this statement:

*MidAmerican Energy Company is No. 1 in the nation in ownership of wind-powered electric generation among rate-regulated utilities and has more than 1,393 megawatts of wind generating facilities in operation, under construction and under contract in Iowa. According to a 2009 report from the American Wind Energy Association, MidAmerican also is No. 1 in the nation for installation of wind generation.*

*MidAmerican began building wind turbines in 2004 and has made the investment without raising customers' electric rates. The price of electricity per kilowatt-hour, the electric rate, for MidAmerican customers is lower today than it was in 1995, and the company has committed to not seek an electric rate increase to become effective until 2014, which is nearly 20 years without a rate increase.<sup>10</sup>*

### **Enormous Potential Remains**

In December 2009, MidAmerican Energy gained approval from the Iowa Utilities Board to build an additional 1,001 megawatts of wind power in Iowa. Thus, even as Iowa is leading the way in harnessing wind energy, there is significant room to increase our use of the wind's renewable power and reduce our greenhouse gas emissions.

In fact, the National Renewable Energy Laboratory (NREL) just completed its first update of United States wind energy potential in 13 years. Their updated estimates were calculated with new, more efficient turbines, situated on taller towers. NREL estimated that more than three-quarters of Iowa has high enough wind speeds at 80 meters above ground to be suitable for wind power development. Thus, Iowa has the maximum technical potential to install 570,714 megawatts. This is obviously different from what is practically achievable, given constraints on transmission and current land uses. However, even with Iowa's outstanding growth in wind power, we currently achieve a small proportion of our potential.<sup>11</sup>

### **Energy Efficiency Part of the Solution**

Iowa has led the nation in producing clean wind power without corresponding price increases. By ramping up our noteworthy energy efficiency efforts, we could meet our electricity demands and reduce greenhouse gas emissions at an even lower cost. Energy efficiency is the cheapest method to address climate change; the Iowa Climate Change Advisory Council estimated a net cost savings by 2020 for a number of actions that would increase Iowa's energy efficiency.<sup>12</sup> The American Council for an Energy Efficient Economy (ACEEE) suggests that efficiency gains of 25 percent to 30 percent are possible by 2030.<sup>13</sup> Previous work by the Iowa Policy Project and ACEEE projected 2,400 to 4,500 jobs could be created in Iowa by 2030 through increasing our energy efficiency.<sup>14</sup>

### **Conclusion**

The new estimates of Iowa's outstanding wind production and the state's potential for new wind production, coupled with our capacity to increase energy efficiency and the positive economic benefits that result, show that Americans need not fear taking strong steps to address climate change. Iowa is showing the way and should continue to grow as a leader.

#### **Notes:**

<sup>1</sup> Personal communication with Iowa Utility Board commissioner Darrell Hanson. February 26, 2010. Sources for estimates included in correspondence:

Installed wind capacity: American Wind Energy Association. 2009. U.S. Wind Energy Projects – Iowa. Available at [www.awea.org/projects/Projects.aspx?s=Iowa](http://www.awea.org/projects/Projects.aspx?s=Iowa);

Average wind capacity factor: Iowa wind industry consultant Tom Wind; and

Iowa 2008 electricity generation: U.S. Department of Energy, Energy Information Administration (preliminary) figures (EIA-923). Available at [www.eia.doe.gov/cneaf/electricity/page/eia906\\_920.html](http://www.eia.doe.gov/cneaf/electricity/page/eia906_920.html).

<sup>2</sup> American Wind Energy Association. January 2010. AWEA Year End 2009 Market Report. Available at [www.awea.org/publications/reports/4Q09.pdf](http://www.awea.org/publications/reports/4Q09.pdf).

<sup>3</sup> Iowa's 3 million citizens live in approximately 1,239,000 homes according to American Community Survey (see [www.statemaster.com/graph/lif\\_ave\\_hou\\_siz-lifestyle-average-household-size](http://www.statemaster.com/graph/lif_ave_hou_siz-lifestyle-average-household-size)). An average U.S. household uses about

10,655 kilowatt-hours of electricity annually. One megawatt of wind capacity can generate between 2.4 and 3 million kilowatt-hours of energy annually. Therefore, a megawatt of wind generates about as much electricity as 225 to 300 households use according to the American Wind Energy Association (see [www.awea.org/faq/wwt\\_basics.html#How%20many%20homes%20can%20one%20megawatt%20of%20wind%20energy%20supply](http://www.awea.org/faq/wwt_basics.html#How%20many%20homes%20can%20one%20megawatt%20of%20wind%20energy%20supply)).

<sup>4</sup>Iowa Utilities Board. Iowa's Electric Profile. Available at [www.state.ia.us/government/com/util/energy/electric\\_profile.html](http://www.state.ia.us/government/com/util/energy/electric_profile.html).

<sup>5</sup>Iowa Policy Project. January 22, 2010. Iowa Jobs Plunge at End of 2009. Available at [www.iowapolicyproject.org/IowaJobWatch0110.html](http://www.iowapolicyproject.org/IowaJobWatch0110.html).

<sup>6</sup> Provided by Pete McRoberts, Office of Governor Culver on February 25, 2010.

<sup>7</sup> Energy Information Association. January 21, 2010. Average Price by State by Provider. Available at [www.eia.doe.gov/cneaf/electricity/epa/average\\_price\\_state.xls](http://www.eia.doe.gov/cneaf/electricity/epa/average_price_state.xls).

<sup>8</sup> Pew Center on Global Climate Change. August 2007. States with Renewable Portfolio Standards. Available at [www.pewclimate.org/node/1303](http://www.pewclimate.org/node/1303).

<sup>9</sup> American Wind Energy Association. February 18, 2010. U.S. Wind Resource Even Larger than Previously Estimated: Government Assessment. Available at [www.awea.org/newsroom/releases/02-18-10\\_US\\_Wind\\_Resource\\_Larger.html](http://www.awea.org/newsroom/releases/02-18-10_US_Wind_Resource_Larger.html).

<sup>10</sup> MidAmerican Energy. 2010. Wind Energy Overview. Available at: [www.midamericanenergy.com/wind/overview.aspx](http://www.midamericanenergy.com/wind/overview.aspx).

<sup>11</sup> National Renewable Energy Laboratory. February 19, 2010. New Wind Resource Maps and Wind Potential Estimates for the United States. Available at: [www.windpoweringamerica.gov/filter\\_detail.asp?itemid=2542](http://www.windpoweringamerica.gov/filter_detail.asp?itemid=2542).

<sup>12</sup> Iowa Climate Change Advisory Council. 2008. Final ICCAC Report. Available at [www.iaclimatechange.us/capag.cfm](http://www.iaclimatechange.us/capag.cfm).

<sup>13</sup> Skip Laitner and Teresa Galluzzo. 2008. Energy Efficiency and Iowa's Economy. Available at <http://www.iowapolicyproject.org/2008docs/080716-EE2.pdf>.

<sup>14</sup> Skip Laitner and Teresa Galluzzo. 2008. Energy Efficiency and Iowa's Economy. Available at [www.iowapolicyproject.org/2008docs/080716-EE2.pdf](http://www.iowapolicyproject.org/2008docs/080716-EE2.pdf).

## Authors

**David Osterberg** (M.S. and M.A., University of Wisconsin-Madison, water resources management and agricultural economics) is co-founder and executive director of the Iowa Policy Project. He is a noted Iowa expert on environmental policy and on advancements and economic impacts of renewable energy policy. While in the Iowa General Assembly he chaired the House Energy and Environmental Protection Committee. He also was special assistant to the Director of the Iowa Department of Natural Resources.

**Teresa Galluzzo** (M.S., University of Montana, environmental studies) is a research associate at the Iowa Policy Project, specializing in environmental and energy issue analysis. She has authored reports on the economic impacts of renewable energy and energy efficiency, Iowa's wind-powered schools and a previous report on Iowa's wind generation.

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## The Iowa Policy Project

Formed in 2001, the Iowa Policy Project (IPP) is a nonprofit, nonpartisan research organization that analyzes state issues on environment and energy policy, as well as budgetary and economic opportunity issues. Access this report and other IPP research at [www.IowaPolicyProject.org](http://www.IowaPolicyProject.org).

The Iowa Policy Project promotes public policy that fosters economic opportunity while safeguarding the health and well-being of Iowa's people and the environment. By providing a foundation of fact-based, objective research and engaging the public in an informed discussion of policy alternatives, IPP advances effective, accountable and fair government.