



The Iowa Policy Project

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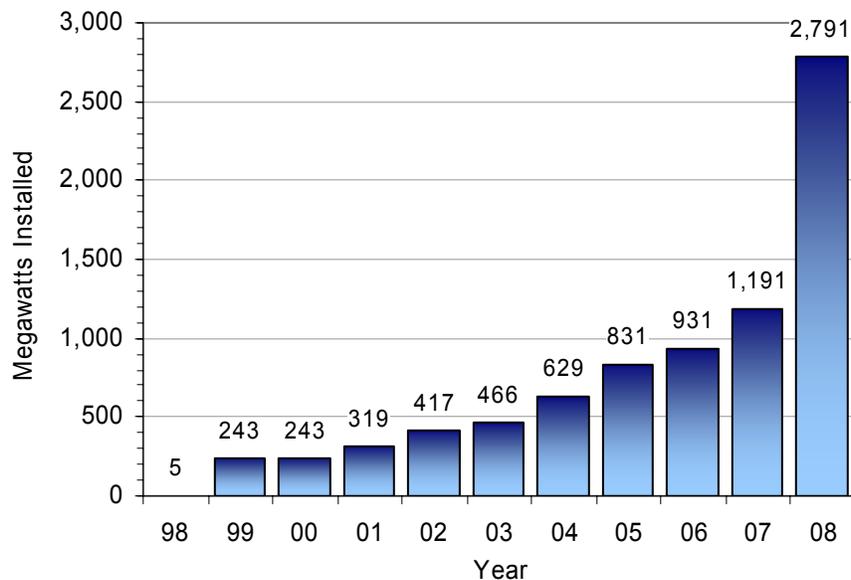
A Windfall of Green Energy: Iowa's Growing Generation of Wind-Powered Electricity

By Teresa Galluzzo and David Osterberg

It's 2009, do you know where your power is coming from? According to new estimates by the Iowa Utilities Board, wind fuels about 15 percent of the electricity generated in Iowa.¹ This is a big increase from the 5 percent wind-powered generation estimated in 2006.²

There have been consistent signs that Iowa has been increasing its wind power, including the ones right before our eyes: the construction of towers and spinning of turbine blades. Iowa has also regularly been at the top in national rankings of states' wind production. As of the end of 2008, the American Wind Energy Association (AWEA) tabulated that Iowa was second in the nation in installed wind power capacity. Iowa had installed 2,791 megawatts (MW) of nameplate capacity by year-end 2008, equal to 11 percent of the nation's total wind capacity.³

Figure 1. Rapid Growth of Wind Production in Iowa⁴



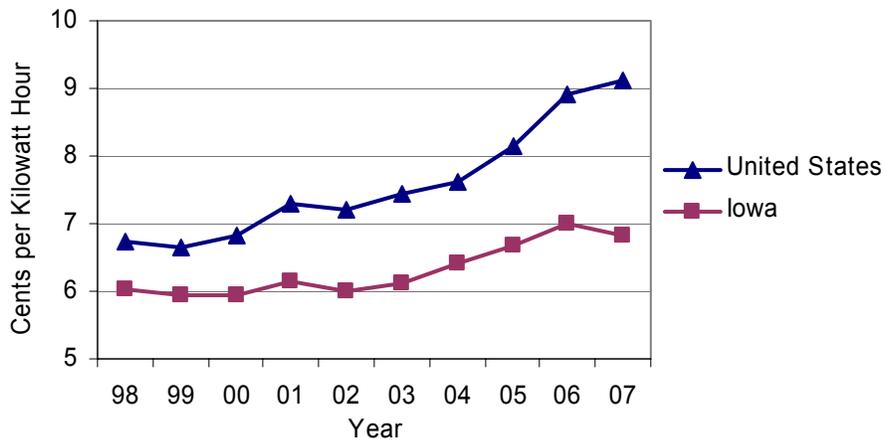
The number of wind turbine-related companies setting up business in Iowa is also an indicator of the growth of Iowa's wind industry. Today, nine companies are dedicated to producing or repairing blades, towers, turbines and turbine components operating or planning operations in Iowa. Despite the current slowdown in demand for turbines and components, these companies employ or plan to employ about 1,400 Iowans.⁵

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Even in 2007, when it was calculated that 5.5 percent of our electricity was produced with wind power, Iowa was the national leader in the percentage of electricity generated from wind.⁶ In order to find comparable examples of wind production, we must look across the ocean to European countries. According to AWEA, Denmark leads the world, producing more than 20 percent of its electricity from wind energy.⁷

Iowa's outstanding growth in wind production calls into question the common argument that the near-term costs of reducing our greenhouse gas emissions and addressing climate change are too high to justify action. Looking at Iowa's electricity prices since 1998 — the year before Iowa's wind boom began — our electricity prices have remained below the national average and in fact have not increased as quickly as the national average price in the last three years (2005 to 2007).⁸ Not only did Iowa's wind generation increase during this period, natural gas generation grew and there was a corresponding decrease in our reliance on coal.⁹ Assuming a somewhat similar portion of the wind-generated electricity produced in Iowa was actually consumed in Iowa, wind's great expansion did not cause prices to spike.

Figure 2. Iowa's Average Electricity Price Less than United States' Average¹⁰



This assessment of the relationship between the expansion of wind-generated electricity and electricity prices is also supported with statements by Iowa's largest electric utility, MidAmerican Energy. MidAmerican has greatly expanded its wind-power production and is close to operating or contracting for 1,200 MW of wind (18 percent of its production). The company's website reinforces our findings on the cost of clean energy with this statement:

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....¹¹

Even as Iowa is leading the way in producing electricity from wind power, significant room remains to reduce our greenhouse gas emissions by increasing our use of renewable energy sources and energy efficiency. On the upper boundaries, AWEA estimates that Iowa has the potential capacity of 62,900 megawatts of wind. This is more than 20 times the amount currently installed.¹²

As noted above, generation of clean energy from wind has not raised prices as some claimed it would. Further, reducing the amount of energy production through energy efficiency is the cheapest method for reducing Iowa's greenhouse gas emissions. Recent work by the Iowa Climate Change Advisory Council estimated a net cost savings by 2020 as a result of proposals that would increase Iowa's energy efficiency.¹³ The American Council for an Energy Efficient Economy (ACEEE) suggests that efficiency

gains of 25 percent to 30 percent are possible by 2030.¹⁴ 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.¹⁵

Thus, the new estimates of Iowa's outstanding wind production and its potential for new wind production, coupled with the Iowa's potential for increasing its energy efficiency and the resulting positive benefits for our economy, show that Iowans need not fear taking strong steps to address climate change. In fact, while still being thoughtful, Iowa should rapidly enact policies that continue to help our renewable energy production and energy efficiency savings grow.

Qualifications for Percentage of Wind Power Estimates¹⁶

The estimated percentage of electricity produced from wind power is stated as a percentage of all electricity actually *generated* in Iowa. The generation estimate includes electricity generated in Iowa by merchant and other plants not under the Iowa Utilities Board's authority.

This is not an estimate of wind-powered electricity *consumed* in Iowa. The percent of wind power consumed in Iowa cannot be estimated because there is not information available on what portion of electricity from each of their fuel sources utilities generating in Iowa use to serve their own retail demands. Similarly, there is not information about the fuel mix electricity utilities sell and whether they sell to other Iowa utilities or out of state. There is also not information about the breakdown of fuel sources for electricity Iowa utilities purchase. Although, some purchased electricity likely comes from wind generation. Wind generated electricity is the cheapest fuel source, thus when it is available it would likely be the first fuel source purchased. Due to these variables it is not possible to estimate whether the percent of wind-powered electricity consumed in Iowa is higher or lower than the percent of wind-powered electricity generated in Iowa.

An unknown in the generation calculation relates to the extent to which wind-generated electricity displaces other fuel sources. Because of wind's variable nature, it does not displace other steady fuel sources such as coal on a one-for-one basis. Unless there is a period of more than a few days where it is guaranteed that the electricity will not be needed, a coal plant cannot shut down, because it must be ready if wind power is unavailable. As the number of wind turbines increases and they are spread across a broad region, the need for keeping base-load generation online at all times and at high power loads should decrease.

With this in mind, the Iowa Utilities Board (IUB) generated two different calculations of wind generation. First, IUB assumed that electricity produced by wind displaced fossil-fuel generation; under this assumption wind accounts for 16.5 percent of Iowa's electricity generation. The second calculation assumed that wind-generated electricity did not replace any fossil fuel produced electricity — that all excess power was sold outside of Iowa. In this scenario, wind accounted for 14.5 percent of Iowa's electricity generation. It is likely that the real amount lies somewhere within this range, which is how we arrived at a 15 percent estimate for wind-powered generation in Iowa.

¹ Iowa Utilities Board. 2009. Personal communication with Darrell Hanson on March 4.

² Iowa Utilities Board. 2007. Iowa's Electric Profile. Available at http://www.state.ia.us/government/com/util/energy/electric_profile.html.

³ American Wind Energy Association. 2008. U.S. Wind Energy Projects as of 12.31.2008. Available at <http://www.awea.org/projects/>

⁴ Data for years 2001-2008 from American Wind Energy Association. 2009. Personal communication with Kathy Belyeu on April 6. Data for years 1998-2000 from Iowa Energy Center. 2007. Personal communication with Kieth Kutz in 2007.

⁵ Iowa Department of Economic Development. 2009. Personal Communication with Beth Govoni on March 31.

⁶ American Wind Energy Association. 2008. AWEA 2008 Annual Rankings Report. Available at http://www.awea.org/AWEA_Annual_Rankings_Report.pdf

- ⁷ American Wind Energy Association. 2008. Wind Power – Clean and Reliable. Available at http://www.awea.org/utility/pdf/Wind_and_Reliability_Factsheet.pdf
- ⁸ Energy Information Association. 2009. 1990-2007 Average Price by Provider (EIA-861). Available at http://www.eia.doe.gov/cneaf/electricity/epa/average_price_state.xls.
- ⁹ Energy Information Administration. 2009. Net Generation by State by Type of Producer by Energy Source (EIA-906). Available at http://www.eia.doe.gov/cneaf/electricity/epa/generation_state.xls.
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- ¹¹ MidAmerican Energy Company. 2009. Wind Energy. Available at <http://www.midamericanenergy.com/wind/html/default.asp>.
- ¹² American Wind Energy Association. 2008. U.S. Wind Energy Projects – Iowa. Available at <http://www.awea.org/projects/Projects.aspx?s=Iowa>.
- ¹³ Iowa Climate Change Advisory Council. 2008. Final ICCAC Report. Available at <http://www.iaclimatechange.us/capag.cfm>.
- ¹⁴ Skip Laitner and Teresa Galluzzo. 2008. Energy Efficiency and Iowa's Economy. Available at <http://www.iowapolicyproject.org/2008docs/080716-EE2.pdf>
- ¹⁵ Skip Laitner and Teresa Galluzzo. 2008. Energy Efficiency and Iowa's Economy. Available at <http://www.iowapolicyproject.org/2008docs/080716-EE2.pdf>
- ¹⁶ Iowa Utilities Board. 2009. Personal communication with Darrell Hanson on March 4.