



# From corn to wind: the Iowa story

Once known only as a rural backwater with miles of cornfields, Iowa has undergone an image change: it is now a wind industry powerhouse in the US.

Iowa's installed wind energy capacity in 2009 was 3,670 MW, the second largest in the country, after Texas, according to the American Wind Energy Association (AWEA). The state's wind energy output even surpassed California, where wind energy was first invented in the US, two years ago. Iowa now leads the country with 17 to 20 % of its electricity generated by wind power, according to the Iowa Utilities Board (IUB), moving the state near the 20 % benchmark. Although AWEA figures place Iowa's wind-powered electricity at 14.2 % (due to a slightly different method of calculation compared with IUB figures), Iowa is still the first state to exceed 10 % of wind energy generation on an annual basis.

## Remote, but not too remote

The state's location favoured the industry. "We're in a good wind band that runs from Canada down to Texas," explained Bob Loyd, Plant Manager at Clipper Windpower in Cedar Rapids, Iowa. "We're remote, but not so remote that it is difficult to get wind farms up and running and maintain them." Iowa is in a wind region called "Buffalo Ridge", a geographic feature that

separates the eastern and western US and stretches from the northern to the southern border of the country. "If we were to harness all of the wind potential on Buffalo Ridge, we could produce sixteen times the amount of electricity consumption in the US," said Harold Prior, President and founder of the Iowa Wind Energy Association (IWEA). Much of Iowa's wind is produced in the northern and western parts of the state, but its grid covers all of Iowa with wind farms carrying power to the state's eastern half where the bulk of the demand is located.

But good geography, though necessary, was not enough. Iowans have combined key elements to transform the state into the wind equivalent of California's Silicon Valley – including strong government support, a raft of tax incentives and credits, very aggressive utilities, a decline in the cost of wind power, a solid manufacturing base, a highly skilled work force, and a network of educational institutes and community colleges with curriculums closely tied to wind research. "It was a combination of policies and incentives that came to bear fruit in energizing the wind industry," reported Tom Wind, owner of Wind Utility Consulting company in Jamaica, Iowa.

## A tough battle for own wind farms

The origins of Iowa's wind industry go back to 1983 when the legislature passed the country's first Renewable Energy Standard (RES). In 1991, the legis-

Wind farm in the vicinity of Harris, northwest of the state capital Des Moines. The farmers in Iowa mainly produce pigs, corn, soy beans, potatoes, cows and dairy products.

Photos (3): Clipper Windpower

lature amended the law, requiring utilities to purchase about 2 % of their power from wind farms respectively 105 MW of renewable energy statewide per year with no mandated increases.

While the 105 MW standard remains miniscule compared with other states today, it did help jump start discussions about wind and renewable energy. MidAmerican Energy, which today owns more wind turbines than any other investor-owned electric utility in the US, has played a critical role in boosting Iowa's wind power capacity. "MidAmerican catapulted the state into second place in the country," said Wind of Wind Utility Consulting. "If it weren't for MidAmerican, we would be ranked number seven or eight."

In the early stages, it was not always so, however. The utilities, led by MidAmerican, fought a bitter, protracted seven-year battle in court against the RES and eventually lost in 1999. "In the beginning, the utilities were dragged kicking and screaming by the regulators and they resisted," said an executive from a turbine company who declined to be named. At the time, MidAmerican purchased only the required minimum amount of wind energy, while independent power pro-

ducers began building wind farms. Unable to legally own wind farms, utilities remained on the sidelines. That changed in 2003, however, when the state legislature again amended the law, and utilities, for the first time, were permitted to build and operate their own wind farms. Of all the legislature's actions, "this is the single most important policy because it lets utilities own wind farms and they can put the costs into the rates," explained Wind of Wind Utility Consulting. "This really spurred on MidAmerican and is what made them get on the bandwagon."

"Historically, utilities bought wind from independent power producers. Now, they are building wind farms themselves. Price is one thing; control of wind farms is another", added Rob Hach, President of Anemometry Specialists in Alta, Iowa. MidAmerican, which has more than 1,393 MW in generating capacity, has now embraced wind wholeheartedly. Its electricity rates are among the lowest in the nation and the utility states on its website that it will not raise rates until 2014.

The company's success also stems from its ability to sell surplus power at a profit outside the state and its astute decision to locate its wind farms near existing power lines. Ultimately, it has also benefited from being a subsidiary of MidAmerican Energy Holdings, which is controlled by Berkshire Hathaway, owned by savvy billionaire investor Warren Buffett.

Even though MidAmerican is a leader of wind energy, David Osterberg, Executive Director of the Iowa Policy Project, a nonpartisan research organization, and associate professor at the University of Iowa, says other wind projects are much less likely to succeed if MidAmerican is their supplier. While the company has a great reputation for developing wind for use in its own system, it has also been known for not letting other wind developers generate power which MidAmerican would then feed back into its own grid. MidAmerican is a leader in the wind industry, but since the utility realized it could make a profit by generating power from its own wind farms, it has tended to obstruct smaller wind projects, seeking to control all aspects of wind generation from potential competitors.

**A lot of wind and enough space for turbines: developers convince farmers to lease about one quarter of their land for US\$ 5,000 to 10,000 per turbine, a transaction farmers welcome as a supplement to their income.**



## “The industry has left the Birkenstock crowd behind”

MidAmerican won a recent battle against NextEra Energy Resources, a Florida-based wind developer, about the rights to build the next 1,000 MW wind farm in Iowa. The Iowa Utilities Board ruled in its favour. “It was a watershed moment, a pivotal moment,” emphasized the executive from the turbine company. “Wind went from being a curiosity and evolved into a regulatory requirement. Now, it’s become a big business about who gets to build and who gets to profit. This was a corporate opportunity. The industry has left the Birkenstock crowd behind.”

The Iowa state legislature has not only enacted laws favourable to utilities, but it and the Office of Economic Development have also worked to attract companies to the state with a variety of incentives and tax breaks. These include property and wind production tax credits and no sales tax on purchase of wind generation equipment. In addition, both the previous governor, Tom Vilsack, and the current governor, Chet Culver, are well known for actively supporting Iowa as a center for wind energy. Vilsack first challenged Iowa in 2000 to produce 10 % of its electricity from wind by 2010, a goal it has since exceeded. Culver has also made expansion of the wind industry a top priority, said Loyd of Clipper Windpower.

Iowa’s approach is particularly striking compared with that of California, which has since fallen into third place in US wind power production. “California makes it difficult to install wind – there is an amount of regulatory hassle in the way,” explained Hach of Anemometry Specialists. “You don’t have to fight with it in Iowa. Both Texas and Iowa have eliminated or reduced regulatory bottlenecks.” In Iowa, from the time a wind farm idea is conceived until its construction and

operation requires about two years or less. Unlike California, Iowa also has the advantage that most of its land is privately held by farmers. California and other western states have vast tracts of public land that are managed by different government agencies, often with conflicting policies and requiring various environmental approval permits. In contrast, having private land facilitates in Iowa wind farm development and there are fewer environmental concerns. Developers convince farmers to lease about one quarter of their land for US\$ 5,000 to 10,000 per turbine, a transaction farmers welcome as a supplement to their income. “Not a week goes by here that I don’t have one or two farmers in my office asking ‘how can I get a developer to put up a wind turbine on my land?’” told Greg Watkins, Renewable Energy Planner at the Office of Energy Independence in Des Moines.

## “Magnet for manufacturing”

Iowa is also a magnet for wind energy companies attracted by other manufacturing firms, a skilled work force, and excellent transporta-

tion infrastructure with two interstates crossing the state. Iowa has about 200 companies that supply its wind industry, producing and repairing everything from towers to blades and nacelles, and providing vital updated map data and planning operations. Clipper Windpower, the first major turbine manufacturer to open a plant in Iowa, was followed by Spain’s Acciona and Germany’s Siemens. TPI Composites, one of the largest blade manufacturers, is located in Newton, Iowa, along with Trinity Structural Towers. In fact, a single figure tells Iowa’s story. In 2008, 47 % of all wind turbines manufactured in the US were made within 500 miles of central Iowa, according to the Iowa Department of Economic Development. It is a one-day drive to deliver equipment. “That’s why Iowa is a magnet for manufacturing,” said Joe Jongeward, Project Manager at the Iowa Department of Economic Development. “That is the whole story.”

With shipping costs of US\$ 300,000 to transport a turbine, geography was an important consideration when executives from Clipper Windpower decided where to locate their plant. In the end, although the state was very helpful, Clipper believed that Iowa could become the center of the wind industry and it wanted to be where the action is. Access to a network of universities and community colleges that coordinate research, training, and testing is another plus. The universities – Iowa State, the University of Iowa, and the University of Northern Iowa – work closely together with five two-year community colleges on curriculum and training issues. The Iowa Lakes Community College is the first in the country to offer a diploma and associate degrees in its wind tech programme.

## No time to rest on its laurels

Despite all of the support for the industry, Iowa still faces the nationwide challenge of having enough transmission capacity to export large amounts of wind power from remote areas to urban centers like Chicago and Kansas City. Originally built to serve local and state needs, the system has become old, very brittle and needs to be upgraded with smart grid technology. “This is a huge issue and may be the single largest obstacle to expansion of the wind industry,” said IWEA’s Prior. Who pays for this enormous investment to upgrade and replace infrastructure is difficult to determine at this point, but how these issues are resolved will decide the pace and scope of the wind industry not only in Iowa but everywhere.

Iowa, however, is not waiting. It is adopting strategies to improve transmission capacity development, promoting smart grid deployment, and researching ways to store energy. This is a state that doesn’t rest on its laurels.

Lynne Curry

### Further information:

American Wind Energy Association (AWEA): [www.awea.org](http://www.awea.org)

Clipper Windpower: [www.clipperwind.com](http://www.clipperwind.com)

Iowa Utilities Board (IUB): [www.iowa.gov/iub/](http://www.iowa.gov/iub/)

Iowa Wind Energy Association (IWEA): [www.iowawindenergy.org](http://www.iowawindenergy.org)

MidAmerican Energy: [www.midamericanenergy.com](http://www.midamericanenergy.com)

In Froelich, a small town in the northeast of Iowa, the tractor was invented. Today, tractor manufacturer John Deere operates several plants in Iowa.



# You are the one who counts

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## Your field of work

Sectors of the renewable energy industry you are involved in:

- Photovoltaics
- Solar thermal systems
- Wind energy
- Biomass/Biogas
- Cogeneration plants
- Others (please specify) \_\_\_\_\_

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## Best description of your company/organisation:

- Local or central government
- Manufacturer/Industry
- Research establishment
- Retail/Installation
- Wholesale
- Consultant in renewable energy
- Architecture/Construction
- Engineering
- Financing institutions
- Private
- Others (please specify) \_\_\_\_\_

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- Proprietor/Managing Director
- Department Manager
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- Others \_\_\_\_\_

## Your opinion

In future, you would like to read more information on the following topics:

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