

## Iowa Harvests the Wind for Economic Development, Education, and Innovation

*By Carol Kreck*

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— The second in a series of papers on rural education issues —

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Wind, Iowa's year-round crop, saves family farms, fuels schools, and creates jobs by the thousands.

Last year, wind made up 25% of Iowa's generated electricity, a bigger percentage than any other state; at the end of December 2012, Iowa had 5,137 megawatts of installed wind capacity, which makes it third in the nation.

All that is about to change, and for the better. In May, billionaire Warren Buffett's MidAmerican Energy announced it will add more than 650 turbines to the landscape (as much as 1,050 megawatts) by 2015, about one-fifth of the wind energy Iowa produced in 2012. Governor Terry Branstad declared the \$1.9 billion project the "largest economic development investment in the history of the state."<sup>1</sup>

### STATE POLICY BOOSTERS

Iowa's governors and legislature have been wind-friendly for decades, reflective of the state's interests in self-sufficiency, economic development, and innovation. Energy crises in 1973 and 1979 spurred interest in wind energy since "Iowa had no economically usable fossil fuels," Iowa wind consultant Tom Wind\* told ECS in an interview. The Iowa Division of Wildlife formed an energy bureau advocating for energy efficiency and renewable energy.

In 1983, Iowa passed the country's first renewable portfolio standard requiring its two investor-owned utilities to own or contract for renewable energy. Seven years later, the Iowa Energy Center, administered by Iowa State University, was created to advance the state's energy efficiency and renewable energy use through research, education, and demonstration.

In 1992, the federal government kickstarted renewables with a production tax credit for wind and bioenergy. In the next decades that credit would expire and be renewed several times, a history that wind energy supporters say created a boom-and-bust cycle.

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\* Wind is his given name, but when asked if he changed it, he tells people, "Yes, it used to be Joe Wind."

A cascade of bills followed year after year, establishing low- and no-interest loans, state tax credits, a utilities requirement to offer green power options to customers, small wind innovation zones, and interconnection standards.

Farmers who allow utilities like MidAmerican to use their land for turbines can make \$6,000 to \$8,000 for new leases, according to Wind. “The farmer loses about half an acre per turbine, and it may take him an extra hour to farm around the turbine per year,” he said. “I also think most farmers take a little pride in having a turbine on their land, as they feel like they are contributing to bringing a clean source of energy to society.”

### VALUE IN ‘SMALL’ WIND EFFORTS

Besides the big utility turbines, small wind systems can power houses, ranches, businesses, and schools.

Spirit Lake School District installed a small wind turbine in 1993 at Superintendent Harold Overmann’s behest, “and he had quite a battle getting it installed,” Wind said. “The problem at Spirit Lake was the reluctance of the electric utility to allow the school to hook up the turbine. The superintendent had to put a lot of pressure on the utility to allow it, and he prevailed. He was a forceful character, and the community was on his side.”

That 250-kilowatt turbine cost \$239,500 and still powers the elementary school. The U.S. Energy Department paid a \$119,000 grant to the district, and the remaining cost was covered by a low-interest loan from the Energy Council of the Iowa Department of Natural Resources. Final payment was made in 1998, three and a half years ahead of schedule.

In 2001, Spirit Lake added a 750-kilowatt turbine at a cost of \$780,000, offsetting the whole district’s energy needs by 46%. A 0% loan of \$250,000 was provided by the Iowa Energy Center’s Alternative Energy Revolving Loan Program, and the Iowa Department of Natural Resources approved another loan at 5.1%. At first, the district used the surplus revenue to pay down its 10-year loans, but now it’s paying for other district expenses instead.

Net billing, also known as net metering, allows schools to bank extra kilowatt hours that their turbines generate at night so they can use that night power during the day.

## Iowa Wind Policy Timeline

Source: Environmental Protection Agency (Evaluation of Department of Energy’s Wind Powering America Initiative).

1983: Iowa passes the nation’s first renewable portfolio standard requiring its two investor-owned utilities to own or contract for renewable energy.

1990: The Iowa Energy Center, administered by Iowa State University, is established to advance Iowa’s energy efficiency and renewable energy use through research, education and demonstration.

1992: The Federal Energy Policy Act establishes the production tax credit for wind and bioenergy resources. This tax credit expired and was renewed multiple times between 1992 and 2012.

1993: A state sales tax exemption is established to exempt the total cost of wind energy equipment and materials used to manufacture, construct, or install wind systems. The exemption was renewed in 2004 and 2009.

1996: Iowa establishes the Alternative Energy Revolving Loan Program to provide low-interest loans to individuals and organizations to install renewable energy systems in the state.

2000: Governor’s task force recommends voluntary goal of 1,000 MW by 2010 (WPA evaluation).

2001: Advanced rate making principles created for utility-owned wind generation (WPA evaluation).

2001: All electric utilities in the state are required to offer green power options to their customers by 2004.

2003: Iowa Utilities Board allows waivers of plant siting rules for wind farms.

2005: Legislation creates two separate production tax credit programs for energy generated by eligible wind and renewable energy facilities.

2008: Renewable energy is exempted from the energy replacement generation tax and the Iowa Utilities Board is required to establish energy efficiency standards for utilities. (WPA evaluation)

2008: Renewable energy rebates created (Farmers Electric Co-op Small Wind ITC) (WPA evaluation).

2009: The federal American Recovery and Reinvestment Act awards \$159 million to Iowa for projects in energy efficiency, electric grid, and science and innovation.

2009: The Small Wind Innovation Zone Program is created, allowing local areas to create specific zones to promote small wind production.

2010: Interconnection standards are enacted, creating a process for customers and utilities to bring their renewable energy generation systems online in the electricity grid.

Not only does Iowa wind energy contribute income to farmers, ranchers, and school districts, but the counties in which they operate benefit as well. With 216 turbines, Pocahontas County has received more than \$3 million in tax revenue over the past three years, according to the Iowa Wind Energy Association (IWEA). Dickinson County has 97 turbines. At the time IWEA was producing its “Wind Power Facts” brochure, Dickinson had collected \$443,470 from its most recent collection cycle to distribute to school districts, the local community college, and a hospital.

### WIND EDUCATION AS BOTH AN EDUCATION AND ECONOMIC DRIVER

All those turbines need to be manufactured and maintained. Nationwide, 85,000 workers are employed in wind-related sectors; in Iowa that number now is between 6,000 and 7,000, according to the IWEA.

Whether jobs are in skilled manufacturing or in engineering, education at some level will have to kick in.

Iowa Lakes Community College was the first in the nation to institute a comprehensive associate degree in Applied Science Degree in Wind Energy and Turbine Technology, said Iowa Lakes president Valerie Newhouse. Initially, the idea was to install a turbine for its own energy needs, but they quickly realized their turbine could be a teaching tool.

“This program was built from the ground up, meaning we utilized an advisory board comprised of representatives from the industry to develop the curriculum and competencies,” Newhouse told ECS. “We started this program in the fall of 2004 with one instructor and 13 students.”

Today the program has a total of six instructors. In Fall 2010, 102 freshmen were accepted. The program had a total enrollment of 111 in 2013.

At the time the college began using the turbine as a teaching tool, the industry hadn’t taken off yet. “In fact, a wind program at a neighboring community college in Minnesota had closed just a few years before we started ours,” Newhouse said.

Besides its use as a teaching tool, the Iowa Lakes turbine is plugged into the city’s electrical grid and generates about \$150,000 to \$175,000 in revenue per year for the community college—close to the college’s electrical usage costs.

Newhouse said the wind program has changed the college and the way they do business. “We are much more environmentally conscious now than we were previously, (and) we are in the process of expanding into other renewable areas. We’ve taken initial steps to make that happen.”

### Excerpts from IOWA LAKES COMMUNITY COLLEGE

Economic Development

Top 10 states for wind energy jobs are: Texas, Iowa, California, Oregon, Washington, Illinois, Minnesota, New York, Colorado, and Indiana.

Jobs!

Graduates hired into the operations and maintenance field can expect salaries ranging upward from \$30,000 per year depending on the work they do and the location they are assigned.

Industry-Driven and Informed!

Curriculum is industry-driven. A robust Program Advisory Committee advises and is very valuable. Faculty attend conferences, including the American Wind Energy Association National Conference, to ensure our curriculum keeps pace with industry demands.

Hands On, Relevant!

Students climb the college’s 1.65 megawatt working turbine within the first week to get a feel for what will be expected of them on the job.

STEM Gender Equity!

Women of Wind Energy (WOWE), the American Wind Energy Association and the Iowa Wind Energy Association have been proactive in promoting career opportunities.

STEM!

Iowa Lakes students need to be ready to enroll in intermediate algebra or have already completed a comparable higher level math course.

Rigor!

Students become fully accepted into the Wind Energy Program when they earn a score on ASSET, COMPASS or ACT exam which allows them to enroll in intermediate algebra or a higher level math course.

Source: Iowa Lakes Community College FAQ page: [http://www.iowalakes.edu/academic\\_programs/programs\\_of\\_study/industrial\\_technology/wind\\_energy\\_turbine\\_technology/faqs/](http://www.iowalakes.edu/academic_programs/programs_of_study/industrial_technology/wind_energy_turbine_technology/faqs/)

Iowa Lakes has received a great deal of attention, she said. “Duracell produced an entire commercial surrounding our wind turbine utilizing students and staff members in a 30-second run that was seen around the world for seven months.” Answering the application question, “Where did you find out about Iowa Lakes?,” 118 prospective wind students listed the Duracell commercial.

“Wind program students can expect to earn a salary of \$30,000 to \$70,000, depending on students’ sector of choice and their capabilities,” Daniel Lutat, director of Iowa Lakes’ Wind Energy and Turbine Technology program, told ECS. “The 70K number is reflective of the traveling technicians that some companies utilize to serve specific roles around the country and internationally.”

### STEM CONNECTIONS

Lutat said they are mindful of ensuring a steady supply of students. Iowa Lakes is the Northwest Iowa STEM (science, technology, engineering, mathematics) hub, one of six launched by Governor Terry Branstad in 2012 to promote STEM education and economic development across the state. STEM Regional Manager Kari Webb said Branstad’s Executive Order No. 74 in 2011 resulted in a legislative appropriation of \$4.7 million to advance STEM connections in grades preK-16, and to build strong business partnerships and connections.

“One of the primary mechanisms used to accomplish this goal is the use of scale ups—identifying robust, active learning programs in STEM and then funding them to Iowa educators,” Webb said in an interview with ECS. “In 2012-13, one of our best scale-up programs was KidWind. In our region alone—not surprising since wind energy is so prevalent—we funded nearly \$60,000 in wind professional development, KidWind materials and supplies, and—my favorite—KidWind Challenge,” a student wind turbine design contest.

Tom Wind said Iowa has great policies in place for promoting wind power. “I am not sure we need to do much more legislatively other than keep the present laws on the books.”

### FEDERAL ROLES TO PLAY

At Iowa Lakes, they’d like to see some movement on the federal end.

Lutat said the recent extension of the federal production tax credit has spurred a return to development “although a longer-term policy needs to be implemented to help us stabilize the boom-or-bust cycle that we’ve seen over the past 30 years.”

That federal tax credit helps place a demand on education programs for graduating more trained wind technicians, Newhouse said. Also having a federal standard would help. “Many states already have goals, but not a standard to which resources can be directed.” The other policy that would be helpful would be a comprehensive transmission plan that would enable production to be distributed to areas of need, she said.

“States that have followed Iowa’s pioneering of assertive renewable energy standards and portfolios have been successful in moving the idea that renewable energy is a vital part of a national energy strategy,” Lutat said. “Transmission policies make delivering this energy to load centers more efficient, and will ultimately help renewable energy deliver a North American solution, not just a local one.”

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<sup>i</sup> Jim Malewitz, "Iowa Wind Production Poised to Expand after \$1.9 Billion Buffet Investment," *Huffington Post*, 05 June 2013.

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