



America's Schools Use Wind Energy to Further Their Goals

Spirit Lake, Iowa. Spirit Lake Community Schools District/PIX11342

Wind energy projects can power schools with clean energy, provide revenue for districts, and provide educational opportunities for students. The nation's school districts, always striving to provide the best educational experience possible with limited resources, are installing an increasing number of wind projects. Each project is tailored to benefit local needs and priorities, and the innovative methods of financing these projects are as varied as the communities that implement them.

Iowa

Iowa leads the way in developing school wind projects, in number of projects and project size. As of this writing, eight schools have wind turbines installed, ranging in size from 50 kilowatts (kW) to 750 kW.

The Spirit Lake Community School District pioneered the effort by installing a 250-kW turbine in 1993. The district received a U.S. Department of Energy (DOE) grant of \$119K and funded the remainder of the project with a low-interest loan from the Iowa Department of Natural Resources (DNR).

As of February 2001, the district saved \$124.9K on electric bills and installed a second, larger machine (750 kW) that year. When both turbines are paid off in 2007, the revenue generated (estimated to be \$120K/year) will be used to enhance school programs. District members are also proud of the turbines' contribution to the educational curriculum and the environment.

Iowa school districts have capitalized on state and federal tax incentives. These

include the Renewable Energy Production Incentive (REPI) and the Iowa Energy Center's Alternative Energy Revolving Loan Program. The schools learned from each other's experiences, and the Iowa DNR facilitated the process. Early projects relied on grants for seed money, and later projects relied on low-interest loans. For more information, see www.state.ia.us/dnr/energy/MAIN/renewable/index.html.

Minnesota

In 1995, Lac Qui Parle Valley Schools became the first Minnesota school district to erect a turbine. The district combined a \$60K state grant with a \$200K state interest-free loan to purchase a 225-kW NEG Micon turbine, which provides energy to school buildings. Power generated when school is not in session is sold to Ottertail Power. The system has an anticipated 10-year payback.

Pipestone School District installed a 750-kW NEG Micon, which was funded through the Xcel Energy Renewable Energy Fund. Proceeds are returned to the school fund. Macalester College in St. Paul has a 10-kW turbine on their campus. And Carleton College plans to dedicate a 1.65-MW turbine in September 2004. The turbine will offset about 40% of the college's electricity use (although Carleton plans to sell the electricity to Xcel Energy, rather than use it on campus). The college took advantage of two incentive programs: 1) Minnesota's 1.5 cent/kWh REPI and 2) the Federal REPI.

For more information, see www.windustry.com/community/default.htm.

Illinois

Members of the Bureau Valley School District in Manlius, Illinois, spent a year performing a financial and technical analysis and preparing a proposal for a new 660-kW turbine project with an estimated cost of \$965K. Their analysis shows that the turbine could provide about \$90K per year in energy savings for the district for the next 20 years – money that can be spent on education rather than energy. They received a \$331K grant from the Illinois Clean Energy Fund and a \$150K grant from the Illinois Department of Commerce and Economic Development. The turbine is planned to be online and generating power by the end of 2004.

Pennsylvania

The Shade School in Somerset, Pennsylvania, received a grant from the Community Foundation for the Alleghenies to develop a renewable energy demonstration site to be used in environmental education. Waste Management Inc., which has a landfill in the community, and the local power company provided matching funds for the project. The system, which includes a Whisper H80 wind turbine, photovoltaic panels, and storage, is housed in a freestanding building near the sports fields. The building provides space for activities such as the school's environmental camp, and the power is used for scoreboards, lighting, etc. The school receives a utility bill credit for power generated and used locally.



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Vermont

The Danville School supplemented a \$33K grant from the state Public Service Board with \$5K of local in-kind services to install its 90-foot-tall, 10-kW, grid-connected system. The turbine is operational but not yet fully instrumented. The school plans to use the system for educational purposes and to generate energy cost savings.

For more information about wind power on state-owned lands in Vermont, please visit www.state.vt.us/psd/Menu/EE_and_Renewable/ee20.htm.

Massachusetts

Building on the Massachusetts Department of Education's School Building Assistance Program, the Massachusetts Technology Collaborative (MTC) launched its Green Schools Initiative in 2001. The intent was to facilitate the construction of high-performance green schools that included significant energy efficiency measures and renewable technologies, such as wind and solar. MTC awarded feasibility study grants to 38 schools and awarded design and construction grants to other schools.

The design and construction projects are in varying stages of completion. Wind turbines as large as 10 kW are planned for areas with good wind resources. In areas with a less desirable wind resource, small units for demonstration and educational purposes are planned. The feasibility studies and descriptions of designs are posted at www.mtpc.org/RenewableEnergy/green_schools.htm. A 100-kW PV array and a 10-kW wind turbine were already installed at Beverly High School in Beverly, Massachusetts, but the school plans to use its grant to pursue adding additional renewable energy features as part of a major renovation project.

Michigan

Zeeland West High School in Holland, Michigan, is home to a 10-kW Bergey XL-10, which was financed primarily through donations. The Zeeland Board of Public Works donated \$20K. Craig Brumels, a local contractor and enthusiast, donated the tower and his time to assemble the tower and turbine. GMB Architects-Engineers donated time for design and engineering, and the school district contributed \$25K.

The system is fully monitored so that students and the public can see how it

Beverly, Massachusetts.
Kimberly Cullinane/PIX13457

Browning, Montana. Martin
Wilde, Blackfeet Community
College/PIX04697



performs. Maintenance entails annual inspection and lubrication. The school will use all the electricity generated and expects to save \$1,200 per year in utility bills.

For more information about school wind projects in Michigan, please visit the Energy Office of Michigan Web site at www.michigan.gov/cis/0,1607,7-154-25676--,00.html.

Native American Community Colleges

The Blackfeet Tribe partially matched a DOE planning grant with Tribal funds to develop a small utility-scale turbine for the Blackfeet Community College in Browning, Montana. Partners in the effort included DOE, the Blackfeet Tribal Business Council, Blackfeet Community College, Glacier Electric Cooperative, Zond Systems Inc., and Montana State University.

A 100-kW Vestas V-17 turbine provides power to offset the college's electric costs through an arrangement with Glacier Electric Cooperative. In the initial test year, the power was purchased at 2.7 cents/kWh, and the college received a \$4.9K credit toward its annual electric bill. Local workers were hired for construction and operations and maintenance, and students participated in environmental analysis.

Installation of a Vestas V-47 660-kW turbine is planned for the Turtle Mountain Community College in North Dakota and



Zeeland, Michigan. Steve Hamstra/PIX13489

another for the Fort Peck Community College in Montana.

For more information on the DOE Tribal Energy Program, see www.eere.energy.gov/tribalenergy.

State Trust Lands

Landowners who lease their lands for utility-scale wind electricity generation are typically compensated at the rate of \$2K to \$5K per year per megawatt-scale turbine. Texas led the way in leasing school state trust lands (sometimes called "endowment lands") to wind farm developers. In Texas, the funds generated from the leases go to the permanent school fund. This model is becoming common in western states. In 2003, the Washington State Department of Natural Resources signed a lease with Sagebrush Power Associates allowing it to locate about a quarter of the new 121-turbine Kittitas Valley Wind Power Project on state trust lands. Expected revenues, which will be used for school construction, are \$5.6M in the first 25 years.

For more information, visit www.glo.state.tx.us/sustain/#wind.

For more information contact: EERE Information Center • 1-877-EERE-INF (1-877-337-3463) • www.eere.energy.gov

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