



Hawkeye Dental Ely, IA

Technical Specifications

20 kW Jacobs Wind
Energy Systems,
Model 29-20
120 ft. lattice tower

Project Cost: \$40,000

AERLP: \$20,000

Loan Term: 10 yrs.

Lender: Wells Fargo Bank

Lender share: \$20,000

Est. Payback: 10 yrs.

Installation Date: November 2002



In November 2002, Gordon Peterson installed a 20 kW Jacobs wind turbine on his acreage in Ely, just south of Cedar Rapids. Peterson's only electric use on the property comes from a small hobby barn, but through a net metering agreement with Alliant Energy his excess production is credited to the energy bills on two other meters.

The first meter covers the common areas of rental property he owns below his second floor dental office in Cedar Rapids. Any remaining credits apply to the meter at the dental office itself, though Peterson's turbine has seldom produced this much power.

Project History

Peterson became interested in putting up a turbine after "reading a lot about it." He saw the turbine primarily as a way to offset some his building's energy use.

The turbine had been used by a previous owner for about a year when Peterson purchased it from a small Wisconsin-based firm. The total cost of the project, including installation of the turbine by the dealer, was \$39,100. On the advice of the installer, Peterson added custom 38 ft. blades to the turbine in hopes that the blades would allow the turbine to produce energy at lower wind speeds than it would with standard 29 ft. blades. He notes that Jacobs was not supportive of the larger blades and offered no guarantee of reliable performance.

Peterson sited the turbine on a hilltop, barely peaking above the surrounding trees and other hills of the Cedar River valley—a less than ideal location. He was very disappointed with the performance of his installer and says that the installation process took about a year to complete.

In July 2003, a tornado destroyed the turbine's blades and tail. Peterson drove the turbine to Prior Lake, Minn., where he had the turbine completely rebuilt by Jacobs. He added custom 31 ft. blades from Advanced Aero Technologies, and the total repair bill came to \$12,734. By the time the turbine was reinstalled on July 29, 2005, it had been out of service for just over two years.

System Performance

Using Iowa Energy Center wind maps, Peterson estimated the turbine would produce about 22,500 kWh per year—a figure that would have meshed well with his actual annual energy use of about 25,000 kWh. With an approximate energy cost of \$0.08 per kWh, he thought the turbine would cut his electricity bills by an average of \$150 per month.

In its first eight months, prior to the tornado, the turbine produced far below expectations with an average monthly credit of about \$43. Peterson says the rebuilt turbine fared even worse after the tornado.

Project Performance

Year	Production (kWh)	Business Use (kWh)	Production/Use (%)	Production Value (\$)
11/15/02 - 11/14/03	3,897	25,311	15.4	389
11/15/03 - 11/14/04	0	NA	NA	0
11/15/04 - 11/14/05	1,408	NA	NA	149
12/15/05 - 12/14/06	7,008	24,123	29.1	771
totals	12,313	49,434		\$1,309
avg.	3,078	24,717	12.5%	\$327

Notes: Estimated annual production of 22,500 kWh

Performance improved markedly when a controller board was replaced, but Peterson says the turbine still ran roughly. In 2006 the turbine finally netted a full year of production, generating 7008 kWh or about 29% of expectations. In late 2007, Peterson's brother-in-law tightened the turbine's blades, and Peterson reports that the turbine began running much better.

Operation and Maintenance

Peterson has been frustrated from the beginning by his inability to secure reliable maintenance assistance. He says his installer agreed to provide routine annual maintenance for about \$1500, but never followed through.

Instead, Peterson has relied on his brother-in-law to maintain the turbine. He has been relatively pleased with the operation of the rebuilt turbine, and says it's operated without any significant repair needs.

Overall Satisfaction

Peterson says he's still enthusiastic about the project, but the lack of maintenance support makes him doubt that he'd do the project again given the existing conditions.

"While I have enjoyed the credits, the novelty, and, to a lesser extent, the challenge of the wind generator, I find it increasingly frustrating trying to find qualified, reliable service personnel to work on this project," he says. "If I was convinced of reliable service and a warranty behind the product I would probably do it all again, but I'm not convinced that exists."

He says he's also not sure he would have gone to the trouble and expense of rebuilding the turbine after the tornado



had it not been for the ten-year, no-interest loan terms provided by the Iowa Energy Center's Alternate Energy Revolving Loan Program.

"It really made the project affordable," he says. "Spreading the payments out over ten years definitely helped."

The Iowa Energy Center's Alternate Energy Revolving Loan Program (AERLP) plays a supporting role in stimulating renewable energy development within the state. Since its inception in 1996, the AERLP has supported numerous wind, biomass, solar, hydro, and hybrid projects.

Successful applicants receive a low-interest loan from a combination of Energy Center and lender funds. The Energy Center provides loan funds equal to 50% of the projects financed cost (up to \$250,000) at 0% interest. Matching financing must be obtained from a lender of the applicant's choice. The maximum loan term for the Energy Center's funds is 20 years.

The lending institutions are responsible for financially qualifying the borrower, while

the energy center assists in technically qualifying the borrower. By partnering with expertise from lending institutions the Energy Center is able to cost-effectively process the loans in a timely manner and maximize the impact of the loan program.

Eligibility

The AERLP is open to all individuals and groups who want to build renewable energy production facilities in Iowa. Utilities that are not required to be rate-regulated are not eligible. AERLP loan funds may not be used to refinance an existing loan or be applied to existing alternate energy facilities.

Application Deadlines

January 31, April 30,
July 31, October 31

For more information

Contact the Iowa Energy Center,
(515) 294-8819
www.energy.iastate.edu

The Iowa Energy Center is dedicated to improving Iowa's energy efficiency and use of renewable energy through research, demonstration, and education.

