



## Wind & Solar Power - Case Study Prehn Cranberry Farm (2) 35 kW Endurance Wind Power 5kW Solar *Soup-to-Nuts Project Support*

### EMERGING TECHNOLOGY

Dr. Fred Prehn knows an opportunity when he sees one. Over a decade ago, he took over one of Wisconsin's many cranberry farms. The farm provides another source of income and satisfies Dr. Prehn's sense of adventure.



When his son suggested that he look into renewable energy, Prehn began to think about how to use the cranberry farm to include a second harvest - electricity.

After a site assessment, he began his research and found that the most promising turbine was manufactured in Canada. The Energie PGE had a long track record of steady reliable production. Because Oakdale Electric coop had net-metering limits of 40kW it was important to find a model with a nameplate capacity below the limit.

After applying for both USDA Rural Energy and the Focus on Energy grants, Dr. Prehn placed his order for a 35kW Energie PGE wind turbine on a 140' lattice tower in the Fall of 2008. For good measure,



he included a small roof-mounted solar array in the project to make electricity on the sunny days, when the wind isn't as strong.

### BEST LAID PLANS

In 2009, Dr. Prehn's Farm was host to the Wisconsin Cranberry Growers Association Annual meeting, and the plan was to have the renewable energy systems installed in good time to showcase at the annual event.

Shortly after the wind turbine was ordered, the manufacturer was sold to a U.S. company and the entire schedule was thrown into a tail-spin. The purchase order made to the Canadian company was the only one transferred in the sale. Dr. Prehn had the option to get out of the agreement and shop around for another system, or wait until the new owners, Endurance Wind Power could deliver his turbine.

While the new manufacturers got a handle on their process, it became clear that the delay would push back the installation a few months past the expected delivery date. Prehn chose to stick with the freshly named Endurance Wind Power G-3I20, recognizing the opportunity to install the first of its kind in the U.S. He also knew that the cost would increase substantially when the system was commercially available to the U.S. market.



## PROJECT SPECS

### Client

Prehn Cranberry Company  
Dr. Fred Prehn, owner

### Location: Town and County

N11400 County N, Town of Byron  
Monroe County

### Goals for installing wind system

Offset electric load at cranberry farm including a shop, several houses, and irrigation equipment

### Utility

Oakdale Electric Coop (40kW net metering limit)

### Grants/Incentives Received

WI Focus on Energy  
USDA REAP  
Federal Treasury grant

### Make and Model of systems

(2) Endurance G-3120  
Roof Mounted Solar array

### Tower type and height

140' free-standing lattice towers

### Name plate kW capacity of systems

35kW wind x (2)  
5kW solar

### Expected annual energy output

84,577 @ 12.2 mph x 2 = 169,154 kWh  
Plus 6,000 kWh from the solar array

### Total cost of system before incentives

\$242,953 total system cost - Turbine 1  
\$337,650 total system cost - Turbine 2  
\$44,741 total system cost - Solar

### Maintenance schedule and requirements on this turbine

Annual maintenance in spring



## PATIENCE PAYS

As a relatively new turbine and tower design, the Endurance G-3120 was not without its challenges. Foundation designs were delayed along with the shipping of the equipment. Seventh Generation worked along with Dr. Prehn and the management of Endurance Wind Power to secure all of the pieces necessary to bring the project to fruition.



Fortunately, Endurance Wind Power was prepared for the start-up of a new model and installation day came on a blustery December afternoon. Because the system was originally designed for a shorter tilt-up tower, the blades needed to be secured to the rotor while the Seventh Generation crew worked beneath the nacelle suspended by a crane. The lift of the nacelle and rotor were secured in place and ready to produce.

## A SECOND WIND

With his feet wet in the project process, Dr. Prehn took a leap and decided to take advantage of incentives to purchase a second system. The investment in renewable resources makes good sense for the long-term economic viability of the cranberry farm. Incentives from Focus on Energy coupled with the Treasury Grant provided nearly 50% of the system cost, narrowing the window of return on his investment.

This time around the wind turbine and tower was ordered and installed within a healthy six-month window. After some initial interconnection glitches were worked out, both turbines are performing well and meeting expectations.

Pioneers like Dr. Fred Prehn get us closer to an economy and environment where wind and solar energy systems are commonplace.

“Hopefully over time, as more and more people buy them, the cost will go down. I hope ten years from now, they’ll be dotting the landscape”

- Dr. Fred Prehn



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