

We Energies' generating system



WIND

Byron Wind Turbines

In the mid-1990s, We Energies wanted to meet growing customer demand for renewable energy generated from sources such as the sun, wind, water and plant materials. To accomplish this, we launched the Energy for Tomorrow® renewable energy program in June of 1996.

The Energy for Tomorrow program initially offered electricity generated from water and plant materials – more often referred to as hydropower and biomass. The program was a success, and customer demand for it increased. To expand the program, and make a highly visible commitment to renewable energy, We Energies added electricity from wind power in 1999.



Location:

Research showed that the Niagara Escarpment, a high ridge running through eastern Wisconsin, would be a favorable location for wind turbines. At a site near Byron, the average wind speeds were approximately 14 mph, the land was privately owned and accessible, power lines were nearby, and the location was away from the migratory routes of many birds.

Type of Plant:

Wind turbine

Initial Cost:

\$1.6 million

Units:

2 turbines

Year in Service:

1999

Net Generating Capacity:

660 kilowatts each

Byron Wind Turbines

Turbine Manufacturer:

Vestas – American Wind Technology, Inc.

Turbine Design:

The Vestas V47 is a horizontal axis, up-wind pitch regulated wind turbine.

Total Weight:

Tower and turbine: 104 tons

Rotor Design:

Three blades constructed of glass fiber-reinforced epoxy.

Rotor Radius:

154 ft.

Rotor Speed:

28.5 rpm

Generator:

Asynchronous four pole Optislip (rg) generator with wound rotor. Rotor current controller and resistors allow for variable slip generator operation with up to 10 percent rpm variation from nominal speed.

Generator Nominal Voltage:

690 volts

Integrated Lightning Protection:

The protection system includes lightning receptors and conductors in the rotor blades, lightning arrestors, deep earth grounding and shielding.

Control System:

A microprocessor controls all turbine functions. The controller interfaces with the Vestas Remote Panel (VRP) that allows for remote access, control and turbine diagnostics.

Tower Dimensions:

Hub Height:	215 ft.
Weight:	147,000 lbs.
Base diameter:	12.1 ft.
Rated Power Output:	660 kw @ 34 mph

Cut-in Wind Speed:

9 mph

Cut-out Wind Speed:

56 mph

Extreme Gust Wind Speed:

134 mph