

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, the Energy for Tomorrow® renewable energy program was launched in June of 1996.



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 Wind Systems

Turbine design:

Vestas V47 is a horizontal axis, pitch-regulated, upwind turbine.

Total weight:

Tower and turbine: 104 tons

Rotor design:

Three blades constructed of fiberglass-reinforced epoxy.

Rotor diameter:

47 meters (154 feet)

Rotor speed:

28.5 rpm

Generator:

Asynchronous four-pole 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:

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.

Tower dimensions:

Hub height:	215 feet
Weight:	147,000 pounds
Base diameter:	12.1 feet
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