

Fact File

Facts and figures

Ontario's first commercial wind farm, Huron Wind is situated on a 40-hectare lot next to the Bruce Power Visitors' Centre in Bruce County, Ontario.

The site was selected because of suitable wind conditions and the property's proximity to transmission facilities and roads. Compatibility with the environment was a major consideration as well as the aesthetics of the wind farm on the surrounding properties.

Information about the wind farm follows:

- ❑ The wind farm consists of five 1.8-megawatt wind turbines with a combined output of nine megawatts. Altogether, this is enough electricity to supply 3,000 homes on an annual basis.
- ❑ The Huron Wind turbines are Vestas V80 models designed to operate in moderate to high wind conditions. They were manufactured in Denmark and shipped to Canada by sea. They were unloaded in Owen Sound, Ontario and were delivered to the site by truck in shipments that involved 45 loads, many of them oversized and requiring police escort.
- ❑ Each wind turbine is secured to a hexagon-shaped foundation that consists of rebar and 230 cubic metres of concrete. The foundations are approximately 1.5 metres deep by six metres wide with a centred embedment ring that houses the turbine tower.
- ❑ The towers are four metres (13 feet) in diameter at the base and 2.3 metres (7.5 feet) at the top. They are approximately 78 metres (256 feet) tall at hub height. That's almost to the ceiling of Toronto's Skydome and about one-quarter the height of New York's Empire State Building. Tapered, they are made from plate steel and provide an interior access-way via a ladder to the nacelle.



A 63-tonne nacelle arrives at the Huron Wind farm during construction in the fall of 2002. A partially assembled rotor is in the foreground to the right.



- ❑ A bus-sized nacelle is mounted on top of each tower. The nacelle contains the cooling systems, shafts, gearbox, generator and associated electronics. It weighs approximately 63 tonnes.
- ❑ A rotor with a hub assembly connects to the nacelle. The rotors have three blades and spin at 15.5 revolutions per minute (rpm). This is about 15.5 times faster than the second hand on a watch. The rotor diameter is 80 metres. The rotor weight is approximately 35 tonnes.
- ❑ The blades are made of glass fibre reinforced plastic and are 39 metres (128 feet) long, with a steel frame.
- ❑ The turbine starts to produce electricity when the wind reaches speeds of four metres per second (14 kilometres per hour or nine miles per hour). It reaches full power when the wind reaches 16 metres per second (58 kilometres per hour or 36 miles per hour). The turbine shuts itself down for protection when winds reach 25 metres per second (90 kilometres per hour or 56 miles per hour).
- ❑ When the turbine is paused it still detects wind direction and turns itself into the wind. The blades are pitched or “feathered” however, to prevent the production of electricity. This feathering causes the rotor to revolve slowly.
- ❑ From the ground to the tip of the highest blade, the Huron Wind turbines are 117 metres (384 feet) tall.
- ❑ The generator operates at 60 hertz, 690 volts, and 1,800 to 1,980 revolutions per minute. An OptiSlip® feature allows the generator and the rotor to vary speeds by up to 10 per cent during wind gusts.
- ❑ Step-up transformers at each wind turbine convert the electricity to 26 kilovolts. Underground cables transmit the power to a common substation. The substation converts the power to 44 kilovolts and feeds it into the electricity distribution system.
- ❑ The cost of the Huron Wind project with infrastructure was roughly \$15-million Canadian.
- ❑ The wind turbines have a design-life expectancy of 20 years.
- ❑ Germanischer Lloyd, an independent certifying body, verified the design of the wind turbines.
- ❑ TerraChoice Environmental Services as authorized by Environment Canada has certified the Huron Wind farm in the Environmental Choice Program for providing clean, renewable electricity to customers.