

## **Fact File**

### **How do the wind turbines produce electricity?**

The wind turbines at Huron Wind produce electricity with generators in much the same manner as hydroelectric plants, fossil-fueled generating stations or nuclear generating stations in Ontario. A shaft rotates a dense coil of insulated wire between the poles of a powerful magnet in the generator, which creates a flow of electrons that become electric current. The Huron Wind turbines are induction generators similar to a bicycle dynamo, which means that they will shut down if they are cut off from the electrical grid.

At a hydroelectric plant, water drives a turbine, which spins the shaft. Fossil-fueled plants burn coal or oil to produce steam which drives a turbine to spin the shaft, and nuclear plants use the heat from the fissioning of atoms to create steam for the same purpose. The wind is used to drive turbines at Huron Wind.

Three large blades on each wind turbine spin in the wind turning a rotor to create mechanical power. Inside the top of the turbine or the nacelle, a large shaft connects the rotor to a gearbox, which creates more spin, connecting a smaller shaft to the generator. Electricity is created and transferred down to an underground cable and on into the province's electricity grid.

The wind turbines at Huron Wind have weather stations and computer controls that provide information on wind speed and direction. As the wind changes direction, the turbines rotate into the wind. If the wind becomes too slow or too fast, the wind turbine shuts down.

The wind has to be at least four metres per second (m/s) at blade-height for the Huron Wind turbines to produce electricity. To pick up strong, smooth winds, unaffected by buildings and surface stresses, the rotors that house the blades are mounted on 78-metre high towers. At 25 m/s the turbines shut down to prevent the production of too much power for the components and overheating. They also shut down if struck by lightning or if the transmission power lines are removed from service. In addition, every six months or so the wind turbines are each taken out of service for a day to complete preventive maintenance.

The five 1.8-megawatt wind turbines at Huron Wind produce an average output of enough energy to supply up to 3,000 Ontario homes annually.