



SUSTAINABLE BUILDINGS AND COMMUNITIES GROUP SMALL WIND TURBINES R&D

CLEAN ENERGY TECHNOLOGIES



ADAPTATION FOR APPLICATION IN THE CANADIAN CLIMATE

In recent years there has been growing interest in distributed energy generation to alleviate the pressure of peak power demands on the electrical grids, to manage energy prices, and to offer cleaner energy sources. Experts at the CANMET Energy Technology Centre (CETC) conduct research and development on renewable energy technologies to create opportunities for Canadian companies in a growing distributed generation industry as well as to adapt foreign technologies for application in the Canadian climate.

As part of their activities, CETC's Renewable Energy Technology experts installed a 20 kW wind turbine at its Bells Corners Complex (Ottawa) in December 2006. The project is aimed at evaluating the performance of a French wind turbine and the subsequent modification and manufacture of a system in Canada designed for operation in Canadian climatic conditions. Vergnet Canada, a Canadian-owned manufacturer of 10, 20 and 60 kW wind turbines, is the industry partner on this project.

The turbine is a 2-blade upwind machine with a hub height of 24 metres and a 10 metre rotor diameter. It is expected to produce approximately 14 MWh/year of clean energy, displacing 7 tonnes of CO₂ equivalent per year. The turbine was donated to the Atlantic Wind Test Site (presently the Wind Energy Institute of Canada) and loaned to CETC for research and development activities.

As part of the research project, the 20 kW wind turbine will provide operating experience for low wind conditions. In future, it will be used in research projects on electricity storage, including hydrogen production, large capacity batteries, and running in parallel with other forms of distributed generation. The wind turbine will also be used for the testing of electrical components such as invertors.

A recent Market Survey on Small Wind Turbines commissioned by the Renewable Energy Technology group concluded that the potential for 20 kW turbines is in the order of 12,300 units across the country, primarily for farming and commercial applications. This would translate into 246,000 kW of capacity, or 5 GWh/yr energy output, and \$812M/yr investment.

