

## Wind Turbine Generator

The vast expanse of Exhibition Place is now the home of the LW 58 wind turbine generator. Using highly advanced direct drive technology, the elegant wind energy conversion system produces high-quality electric power with its Lagerwey ring generator.

Having significantly reduced the number of components by using direct drive turbines, overall reliability has been increased. For instance, the rotor and generator, rotating in one integrated unit, are supported by a unique single bearing system. The absence of a gearbox simplifies maintenance procedures. And the use of a monocoque nacelle allows all-weather access to essential systems and controls.

### Benefits

The wind turbine is a sustainable source of power and helps to reduce our dependency on carbon-based and non-renewable sources of power. It produces an average of 1,400 megawatt hours of power, equivalent to the electricity needed for about 250 homes.

Compared to traditional methods and technologies of power production, the wind turbine will reduce emissions by 494 tons of carbon dioxide (CO<sub>2</sub>), 8,300 kilograms of sulphur dioxide (SO<sub>2</sub>) and 2,460 kilograms of nitrous oxide (NO<sub>x</sub>) - the main components of acid rain.

Overall, grid connection costs were reduced, as optimised grid properties allowed for better utilisation of existing infrastructures.

A key programmable function is the power factor, which can be adjusted on demand. Owing to its sophisticated inverter system and advanced control electronics, the variable-speed 750 kW turbine is ready for both present and future requirements, and is optimised for moderate wind resources - such as Toronto's - by virtue of its 58m diameter rotor and variable pitch blades.



## Exhibition Place Wind Turbine Generator Toronto

### Project Summary

- 1st urban city Wind Turbine in North America
- Green Energy Generation
- Project cost: \$1.6 million

### Description

- 750 kW generator
- 65m tubular tower
- Post-tensioned caisson foundation support
- 13.8 kV grid parallel interconnection
- Energy yield = 1815 MWh annually

### Challenges

- Compact site with historical significance
- Situated upon low-bearing man-made fill
- Non-standard permits, approvals
- Community awareness program
- Overseas materials procurement

### Partners

- Toronto Hydro Energy Services & TREC Wind Cooperative