



Canadian Wind Energy Case Studies

January 2004

Toronto, Ontario

Ontario continues to move its wind energy industry forward and Toronto as one of the most dynamic cities in North America has been at the forefront of innovation. With 2.6 million residents in the metropolitan area and over 4.6 million residents in the Greater Toronto Area, Toronto continues to exist as a leading business and political centre. This atmosphere served as the perfect focal point for one of North America's most innovative wind power projects. The Exhibition Place Turbine, located along the shore of Lake Ontario, represents North America's first urban wind turbine.

The turbine was the brainchild of the North Toronto Green Community, which was concerned that business and government were not acting quickly enough to address issues such as smog and climate change. The group created the Toronto Renewable Energy Co-operative (TREC), which was modeled after similar wind power cooperatives in Denmark, to work on the development of a wind turbine for the City. In 1999, Toronto Hydro Energy Services Inc

(THESI) partnered with TREC, to form an equal Joint Venture that would build and operate a wind turbine on the waterfront. It was later determined that WindShare, a separate cooperative created by TREC, would own and manage their share of the asset.

The result was a 750 KW turbine from Lagerwey B.V. in the Netherlands being



installed in December 2002, with power beginning to flow in January 2003. The annual output of the turbines is anticipated to be 1.4 million kWh the equivalent of reducing 1,400 tonnes of greenhouse gases annually.

Wind Power Benefits

Public awareness and concern over the environmental impacts of conventional electricity production continues to grow. From an environmental perspective, Wind energy is a proven electricity source that does not contribute to climate change, air and water pollution, destroy habitat, or generate solid, toxic or nuclear wastes. Wind Energy can be substituted for other forms of electricity production to decrease environmental concerns arising from the electricity sector.

A single wind turbine (660 kW) in an average year will produce 2,000 MWh of electricity, enough power for over 250 Canadian homes. Using wind to produce electricity rather than burning coal will leave 900,000 kilograms of coal in the ground and reduce 2,000 tonnes of greenhouse gases annually, the same positive impact as taking 417 cars off the road or planting 10,000 trees. Newer and larger wind turbines will result in an even greater positive impact. *Canada now has 326 MW of wind energy capacity and CanWEA's goal is 10,000 MW by 2010.*

Local Economic Impacts

The overall investment in the Exhibition Place turbine was approximately \$1.7 million. WindShare and THESI placed a high priority on sourcing as much local content as possible. All of the development work – the wind resource assessment, the geotechnical studies, and the environmental assessment – was sourced from Toronto suppliers. At the peak of activity, TREC employed four individuals to manage the project and conduct some development activity.

In addition, approximately 50-percent of the equipment and construction expenditures were sourced from local Toronto or Ontario suppliers. While the turbine generator and nacelle were imported from the Netherlands, local companies in Ontario manufactured the blades and tower. The foundation design and construction, crane services for erection, and electrical work were all supplied by local Toronto companies. Over 15 local companies were involved in some aspect of development and/or construction. Many of these companies were new or relatively new to the wind industry, and consequently gained valuable experience in a growing sector.

The operational phase of the project resulted in further local economic benefits. As with most wind projects, annual lease payments are paid to the owners of the turbine site, and routine operations and maintenance services are contracted to a local supplier. A post-installation assessment of bird and wildlife impacts has been conducted by a local ornithologist, and a project manager is currently being hired by the Joint Venture to manage the

day-to-day operations of the turbine.

As Canada's first green power co-operative, WindShare will also be distributing dividends to its 427 members over projects lifetime. It is anticipated that the annual yield for members will be in the range of 4-percent to 8-percent, and will total approximately \$1.2 million over the 20 year project. Due to the success of this project, a second turbine is being planned along the waterfront. To date, over \$260,000 has been raised from co-op investors towards the second project. TREC is also in the early stages of developing a 10 to 20 MW community-owned wind farm.

The interest in this project has also spurred a number of initiatives beyond Toronto. A province-wide association was established to support the efforts of twelve new community co-ops that were started to replicate the WindShare project in their regions. The Ontario Sustainable Energy Association now employs four staff, who provide educational, advocacy and project development support to member organizations around the province. Many of these organizations are in the process of hiring their own full-time or part-time staff. Furthermore, a number of the key players in the WindShare team have established a new consulting company to provide services to the private sector. In addition, many of the suppliers and contractors involved in the project have continued to expand their capabilities in relation to wind projects, and a number have acquired business in other provinces as a result.

Public Attitudes

The public response to the wind turbine at Exhibition Place has been overwhelmingly positive. A recent Environics poll commissioned by Toronto Hydro found that 69-percent of individuals surveyed see the wind turbine as a positive addition to the City skyline.

Furthermore, the turbine has received tremendous media attention, with ongoing articles in all major dailies and commentary on network and local television and radio. This coverage has been as much for the visual beauty of the turbine as for its

symbolism of a more progressive energy future. One article quotes John Sewell, former mayor of Toronto, calling the turbine the "symbol for a new Toronto", replacing the CN Tower as the new icon.

TREC and THESI have also developed an educational display at the base of the turbine, which supplies information and facts on the benefits of wind power to the many visitors at Exhibition Place. It is estimated that in the first year, over 250,000 people visited the display, and almost 2,000 received guided tours and presentations.



**Canadian Wind
Energy Association**

Head Office
Suite 750, 130 Slater Street
Ottawa, ON K1P 6E2
Phone: (613) 598-4658 EXT 115
Fax: 613 594-8705
RobertHornung@CanWEA.ca

Administration
100, 3553 – 31st Street N.W.
Calgary, AB T2L 2K7
1-800-922-6932 (or 403-851-0836)
Fax: 403-851-0834
canwea@telus.net