

## **Report 2004 – 04**

To: Mayor and Members of Council

From: Debbe Crandall, Chair, Caledon Environmental Advisory Committee (CEAC)

Date: June 1, 2004

Subject: **Wind Tower Protocol**

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### **Recommendations:**

1. That Council receive CEAC Report 2004 – 04;
2. That Council endorse the concept of “green” energy and encourage its development within the boundaries of the Town of Caledon;
3. That Council direct staff to develop a protocol to provide guidance to potential development applicants regarding the installation of wind towers within the boundaries of the Town; and
4. That Council direct staff to refer a draft of the protocol to CEAC for final review and comment.

### **Discussion<sup>1</sup>:**

According to Decima Research, two-thirds of Canadians want new sources of energy developed over the next two decades, with wind power the most popular option at 36%, solar at 35%, hydroelectricity at 24% and small percentages suggesting hydrogen and tidal.

Some of the most common reasons why people support green sources of power are to:

- Improve human health,
- Preserve the earth for their children and grandchildren,
- Reduce environmental impacts,
- Conserve finite fossil resources, and
- Act as a hedge against rising and volatile fossil fuel prices.

Green power is low environmental impact renewable electricity. Wind power is an especially good choice as green power for several reasons. Wind is a renewable resource because it is

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<sup>1</sup> Drawn, often verbatim, from *A Municipal Guide to Wind Power Development in Ontario – Reference Book*, published by the Canadian Institute for Environmental Law and Policy (CIELAP)

inexhaustible. It is one of the cheapest and cleanest renewable energy sources available. There is no extraction and consumption of fuel, and no air pollution.

Wind power is the world's fastest growing energy source with sustained growth rates in excess of 30% per year. According to the Canadian Wind Energy Association (CanWEA), at the beginning of 2002 worldwide wind-generated capacity exceeded 24,000 megawatts.

Ontario's Ministry of Municipal Affairs and Housing estimates Ontario's land-based wind capacity is about 7500 megawatts, equivalent to about 14 per cent of current electricity consumption. As of April 2003, only 12.1 megawatts of commercially viable wind power is being produced in the province.

Wind energy has surfaced as a leading source of new, renewable energy due to:

- Significant technical advances in turbine design and siting,
- Rising electricity prices,
- Increasing carbon constraints on electricity generation, and
- Government sponsored incentives for renewable sources of energy.

Furthermore, wind power can make a significant contribution towards reducing pollution. For example, a 660 kW hour wind turbine has the capacity to eliminate 1.4 million kg/year of CO<sub>2</sub>, the leading gas contributing to global climate change; and 8,400 kg/year of SO<sub>2</sub> and 5,600 kg/year of NO<sub>x</sub>, both of which are key components in the creation of smog, ground level ozone and acid rain.

In addition, according to the Ontario Ministry of Municipal Affairs and Housing, wind energy can increase the municipal tax base by \$3,000 to 5,000 per year per turbine.

### **Environmental Factors to be Considered<sup>1</sup>:**

According to CIELAP, the environmental and socio-economic issues and impacts regarding the siting of wind turbines are new to government regulators and citizen groups, and have led to lengthy and costly environmental assessments (EA's).

Common issues regarding turbine installations have been:

- Potential impacts on both local and migratory bird populations,
- Noise and visual impacts that could affect local residents, and
- Blade icing, a winter phenomenon whereby ice could form on a blade and become a possible projectile when the blades spin.

With regard to the issue of **impacts on birds**, studies have shown that "Even in poor flying conditions there has never been a mass kill of nocturnal migrants such as are commonly associated with tall buildings or communications towers" (Gipe 1995, Winkelman 1992). It has been concluded that the vast majority of birds can fly unharmed through slowly rotating turbine blades, and that the average turbine kills two birds per year.

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Notwithstanding the above, CIELAP states that “in general, turbines should not be placed in the middle of areas of high concentrations (*of birds*), i.e. in the centers of valleys, ridges, swales, or other microhabitats where large numbers of birds are known to fly or concentrate”.

Similarly, the impact of **noise** of wind turbines appears relatively benign. CIELAP describes the sound heard as the “swoosh, swoosh, swoosh” of the passing blades, similar to the waves on a beach, only more regular, and claims that there is virtually no mechanical sound from a modern wind turbine.

Notwithstanding the fact that the Windshare turbine at the CNE is located in a dense urban area situated beside the Gardiner Expressway, in 1999 the City of Toronto adopted the following turbine location setbacks to alleviate the noise problem and the potential impacts on residents:

- A 200 metre separation between wind turbines and residential low-rise dwellings,
- A 300 metre separation between wind turbines and high-rise residential buildings, and
- A 50 metre separation between wind turbines and sensitive natural areas or sensitive park use areas.

The question of **visuals** appears to present more of a potential problem in populated areas because of the perception that property values may be adversely affected. Or in areas such as the Niagara Escarpment, a wind tower may be seen as an unsightly encroachment on a protected, pristine natural area. However, CIELAP states in its Reference Book that “many individuals consider wind turbines to be a symbol of sustainability”, and that recent studies in the USA and Europe have shown greater public acceptance after construction than before.

The issue of problems associated with **ice** in the wintertime seems to have been resolved technically in that a turbine is designed to automatically shut down when winds exceed anywhere from 70 to 100 km/hr (depending on the equipment used) and whenever a blade imbalance is detected. Therefore, ice shedding does not appear to be a significant risk.

### **Land Use Planning Issues<sup>1</sup>:**

The footprint of a wind turbine is small, and the surrounding land can be used for other purposes or left in its natural state. CIELAP has concluded that for this reason wind development is ideally suited to farming areas, and that farmers can derive increased income from the leasing of land for wind turbines. According to the Ministry of Municipal Affairs and Housing, wind energy can benefit landowners and farmers by as much as approximately \$20,000 to 30,000 per 100 hectares.

With regard to the installation of wind turbines on Crown land, in November 2002, the Ontario Minister of Energy announced “a policy framework dealing with the development of wind power sites on Crown land with royalties payable”. This announcement was made together with a commitment to purchase 20 % of the provincial government’s electricity usage from “green electricity” (no timeline given).

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**Conclusion:**

The Ontario Ministry of Municipal Affairs and Housing has stated that “ Wind power is a renewable energy source with the potential to be a commercially viable source of energy in Ontario. Municipalities across the province are exploring the economic development opportunities of wind energy. One way of preparing for wind energy is by building community support and developing clear land use policies. Within this framework, wind energy can represent an opportunity for economic, social and environmental benefits in many Ontario communities”.<sup>2</sup>

CEAC believes that wind power has the potential to be of benefit to the citizens of the Town of Caledon from both an economic and environmental perspective, and urges Council to give serious consideration to the recommendations contained in this report.

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<sup>2</sup> Quoted from Ontario Municipal Affairs and Housing’s *InfoSheet, Spring 2003*.