

18

WIND ENERGY FEASIBILITY STUDIES

The Finance and Administration Committee recommends the adoption of the recommendations contained in the following report, August 17, 2004, from the Commissioner of Corporate Services:

1. RECOMMENDATIONS

It is recommended that:

1. Committee and Council endorse the inclusion of the Town of Georgina in the Wind Pre-feasibility Study pilot at a total study cost of \$55,000.
2. Committee and Council authorize mesoscale mapping of York Region be completed at a cost of \$11,540.
3. The Region be authorized to enter into Grant Agreements under the Federation of Canadian Municipalities to offset pilot study costs and that the Commissioner of Corporate Services be authorized to execute on the Region's behalf, subject to the prior approval of the Regional Solicitor, the grant agreement(s) and any other documents required to give effect thereto.

2. PURPOSE

The purpose of this report is to:

1. Inform Committee and Council of the work completed to date on the wind energy pre-feasibility study for the Town of Whitchurch-Stouffville.
2. To obtain Council's approval on an approach to future requests for other York Region Local Area Municipalities.

3. BACKGROUND

3.1 Whitchurch-Stouffville Pilot

Regional Council agreed to the Town of Whitchurch-Stouffville's request of January 27, 2004 to investigate implementing a pilot project on "windmill energy" at a location in Whitchurch-Stouffville. The goal of the project is to decrease utility costs by reducing the overall draw from the power grid, produce green power on-site and to respond to the Town of Whitchurch-Stouffville's citizens request for wind power.

Staff have completed a RFP process and have chosen the team consisting of Dillon Consulting and Hélimax to perform the pre-feasibility study. The goal of the pre-feasibility study is to assess the potential to develop a wind power project by examining factors such as wind resource in the area, land availability, any potential environmental constraints, possibility of integrating into the electrical grid and constraints that may be posed by the Oak Ridges Moraine Conservation Plan (Four-fifths of the Town of Whitchurch-Stouffville lies within the Oak Ridges Moraine).

A wind energy project is conducted in three phases as follows: wind pre-feasibility study; detailed feasibility study and business plan; and implementation.

Pre-feasibility: A pre-feasibility identifies any wind “show-stoppers” that would prevent a wind project from proceeding. This study utilizes existing wind data and varies in scope from a simple pre-screening exercise to a more in depth look at engineering and interconnection feasibility.

Detailed feasibility: The rate of return of a wind energy project is highly dependent on the wind resource. A detailed feasibility study would provide a much more rigorous wind analysis including the set up of a wind monitoring station comprising a meteorological tower and anemometers to measure wind direction and intensity. At least one year’s worth of site-specific wind data is required to establish the business case for a wind power project and negotiate potential power purchase agreements(s).

Implementation: The implementation phase includes an environmental assessment, securement of land, purchase and installation of wind turbine(s), and interconnection.

The pre-feasibility study will recommend whether a wind project in Whitchurch-Stouffville is viable. Once the pre-feasibility is completed by November 2004, the Region will decide whether to proceed with a detailed feasibility study. A staff member was assigned from the Town of Whitchurch-Stouffville to be a liaison on this project.

3.2 Environmental Scan

The system by which energy is generated and distributed in Ontario is becoming more local as jurisdictions look for cleaner and more reliable sources of power. Municipal wind projects are at various stages of development across Ontario as follows:

- Niagara Region is proposing a 10 MW wind farm;
- Richmond Hill recently issued an RFP for the Provision of a Wind Power Pre-feasibility and Resource Quantification Study within their jurisdiction;
- The City of Sudbury has embarked upon a 50 MW wind farm, with a joint venture partnership with a private developer that has seen a wind power manufacturer incorporate a subsidiary firm within Sudbury;

- In December 2002 Toronto Renewable Energy Cooperative's WindShare in partnership with Toronto Hydro Energy Service Inc. built the first urban-based, community owned, utility scale (750 kW) wind turbine in North America. WindShare is currently working on the development of a second turbine;
- The Municipality of Northern Bruce Peninsula has developed a 1.8 MW wind project, with another 3.6 MW slated for development; and
- The City of Kingston is implementing a 36 MW wind farm on Wolfe Island.

Local governments are ideally positioned to show leadership in wind power due to their ability to attract both financial incentives and promote environmental initiatives. Local governments have access to an array of grants and financial incentives, such as FCM GMEF, which are not available to private wind developers. By accessing these grants local governments can reduce their costs while positioning themselves to negotiate favourable terms in potential future public-private partnership arrangements.

With the provincial government shutting down all coal plants by 2007, moving towards a target of 10% renewable energy sources by 2010, and also phasing in full-cost user pay for electricity, York Region is in a position to be proactive in addressing future demands and regulations.

The Federal government's current plans call for some 4,000 MW of wind generating capacity to be installed over the next few years. In Ontario, the Ministry of Energy (MOE) released a 300 MW Renewable RFP, with similar RFPs expected to follow. Hence, the conditions in Ontario are promising for wind power.

4. ANALYSIS AND OPTIONS

York's RFP Wind Energy Pre-feasibility Study elicited interest from both Local Area Municipalities and prospective proponents wishing to commend the Region for showing leadership in the field.

The Town of Georgina asked the Region's Corporate Services Department if the Region could also investigate the potential for wind power for their Town, and the Town of Richmond Hill requested a copy of the RFP Terms of Reference.

The Region's position in investigating and promoting further wind power studies within its boundaries must consider a variety of factors, as outlined below.

Confidentiality: The results of a wind feasibility study for one York Region Local Area Municipality are applicable, in part, over all York Region. However the studies which comprise wind regime data, map information etc. are typically held confidential. If York Region took the lead it could leverage the results from the Whitchurch-Stouffville pilot to

study the pre-feasibility of all Local Area Municipalities, thereby achieving cost efficiencies and consistency of approach.

Economies of scale: A wind study demands a certain level of familiarity with wind power on behalf of the municipal project liaison. The Region, acting as the lead, could alleviate the wind “learning curve” in each Local Area Municipality and would avoid possible duplication of work. Further benefits are derived by central project and grant coordination and by spreading fixed costs across a larger geographical area.

Requests from other area municipalities to conduct pre-feasibility studies. The following sections describe two options to address the Town of Georgina’s request for a Wind Energy Pre-feasibility Study while considering the potential interest of other York Region Local Area Municipalities.

4.1 Option 1 – Town of Georgina

Staff have received a verbal request from the Town of Georgina to be included in the pilot project.

The Town of Georgina, with access to open water along the shores of Lake Simcoe, is likely to have a more favourable wind regime with respect to other Local Area Municipalities within York Region. Windfall Ecology Centre, a local environmental community group based out of Newmarket, has already engaged local community groups and carried out some wind pre-feasibility work in the area.

This option is the most likely to result in a swift project development. The RFP Wind Energy Pre-feasibility Study for Whitchurch-Stouffville included a Sharing Clause which would allow York to utilize the services of Dillon/Helimax to complete additional Pre-feasibility studies for other York Region Local Area Municipalities. If the Town of Georgina formally requests a pre-feasibility study this project could be expedited efficiently under the same contract.

4.2 Option 2 - All Local Area Municipalities

Other Local Area Municipalities may request the Region to carry out Wind Energy Pre-feasibility Studies for their area.

Additional studies should commence only after the results of the Whitchurch-Stouffville pilot are finalized in order to leverage these findings and capture economies of scale associated with spreading fixed costs over a larger geographical area.

4.3 York Region Mesoscale Wind Speed Map

A mesoscale wind speed map of York Region would help choose a particular site(s) for a wind power project(s) within York Region, not necessarily specific to a Local Area Municipality as the case in Options 1 and 2.

A mesoscale map is a low resolution, “prospecting” tool used to identify areas with the highest potential for wind projects. It uses an atmospheric model combined with 50-yr meteorological inputs and other localized information to produce a colour coded map indicating wind speed and potential power density. Wind speed accuracy ranges between $\pm 5\%$ to $\pm 12\%$; depending on localized topography. The map can be developed within a relatively short period of time, roughly two to four weeks.

One of the factors with the greatest influence on the economic viability of a project is the site wind speed. It is therefore essential to choose a site with the best wind resource (the site should also meet other important criteria included in a pre-feasibility). The mesoscale map ensures that York Region would examine the sites with the highest wind speeds and thereby would enable York to develop the site with the most potential.

4.4 Relationship to Vision 2026

Implementation of the Wind Energy Feasibility findings will assist the Region in promoting conservation, specifically “investigating and promoting alternative energy sources”, which is part of Goal 2 in Vision 2026.

5. FINANCIAL IMPLICATIONS

The following table outlines the costs associated with the Whitchurch-Stouffville pilot as well as the various options described above.

Table 1
Wind Energy Pre-feasibility Costs

Pre-feasibility Costs (\$)	
Whitchurch-Stouffville Pilot	27,500
Option 1 - Town of Georgina	27,500
York Region Mesoscale map	11,540
Total	66,540

An ‘Intent to Apply’ for Federation of Canadian Municipalities (FCM) Green Municipal Enabling Funds (GMEF) was submitted on July 26, 2004 and was successfully approved on August 3, 2004. The pre-feasibility and detailed feasibility work are eligible for FCM funding only if the Region proceeds with a detailed feasibility study. These funds would cover 50% of the cost to complete the studies, up to a maximum of \$350,000.

Wind energy potential revenue, detailed feasibility costs and implementation costs are all determined at later stages of development.

6. LOCAL MUNICIPAL IMPACT

Wind power reduces emissions of carbon dioxide and other pollutants that result from electricity made from fossil fuels such as coal, oil, or gas. Locally generated power, or 'distributed generation', means less wires/infrastructure and associated upgrades, as well as greater municipal control of energy generation and distribution within their jurisdiction.

7. CONCLUSION

The Wind Energy Feasibility Studies will identify preferred sites for wind power in the Region and recommend whether to proceed with a wind energy project. The wind project may result in a potential revenue stream for the Region and/or Local Area Municipalities.

The scope and scale of a wind energy project is defined subsequent to the pre-feasibility stage. A future report summarizing the results of the Whitchurch-Stouffville Wind Energy Pre-feasibility will be tabled for review by Council within six months.

The Senior Management Group has reviewed this report.