

CITY OF HAMILTON

***PUBLIC WORKS DEPARTMENT
Fleet & Facilities Division***

Report to: Mayor and Members Committee of the Whole	Submitted by: John Mater, C.E.T. Acting General Manager Public Works Department
Date: July 28, 2006	Prepared by: Geoff Lupton Extension 7372

**SUBJECT: Cleanfield Energy Corporation - Small Wind Turbine Pilot Program
Proposal to the City of Hamilton - (PW06093) - (City Wide)**

RECOMMENDATION:

- (a) That Council authorizes the General Manager of Public Works or his designate to continue to work with Cleanfield on developing the Small Wind Turbine Pilot Program.
- (b) That prior to signing agreements with Cleanfield, staff will bring a future report back to Council with details.

John Mater, C.E.T.
Acting General Manager
Public Works

EXECUTIVE SUMMARY:

Cleanfield Energy Corporation (Cleanfield) is a manufacturer of small VAWT's (Vertical-Axis Wind Turbines). These VAWT's are considered a renewable energy product and are designed for residential and commercial applications. The VAWT's features three narrow, three meter long vertical blades that rotate around a central axis. They are designed for both roof top and tower installations.

Cleanfield has approached the City of Hamilton and proposes to provide and install up to 150 Vertical-Axis Wind Turbines ("egg beater" style) on the roofs of various of the City's municipal buildings. Cleanfield will be working with other agencies to secure partial funding for the project. Cleanfield proposes that any shortfalls in funding would be captured by Cleanfield.

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Staff from Public Works, Office of Energy Initiatives and staff from Economic Development have reviewed the Cleanfield proposal. This report recommends that staff be authorized to work with Cleanfield to review their proposal in greater detail, with the aid of external expertise (as required) to properly evaluate the risks and opportunities associated with the proposal for the City Of Hamilton.

BACKGROUND:

Cleanfield is a developer, marketer, distributor and manufacturer of innovative proprietary renewable energy products focusing on harnessing wind energy and turning it into electricity. Cleanfield is currently a private company incorporated under the laws of Canada, in the Province of Ontario on December 5, 2002. Additional corporate information can be found on the company website (www.cleanfieldenergy.com) and www.sedar.com (search Strike Resources LTD.)

City staff met with Cleanfield and their representatives on May 29, 2006, at the request of Cleanfield to introduce the City to their prototype small VAWT units. Further to that meeting, on June 13, 2006, Cleanfield provided the City with an unsolicited initial proposal for the supply and installation of 150 small VAWT units. Cleanfield hope to work with the City to showcase their new VAWT product and to promote clean renewable energy wind technologies. This pilot project would be used as a demonstration project for the new VAWT renewable wind energy technology.

ANALYSIS/RATIONALE:

The proposal as outlined in this report, is supplied by **Cleanfield Energy Corporation**

Cleanfield in Summary Proposes the Following:

- Participate in a Rural, Suburban and Urban Wind Energy Pilot Project.
- As part of the project, Cleanfield will provide and install up to 150 Vertical-Axis Wind Turbines (VAWT).
- The systems to be mounted on mutually agreed City of Hamilton or appropriate municipal facilities.
- Capital funding for the proposed 150 wind turbines project would be provided by The Green Municipal Fund (GMF), Sustainable Development Technology Canada and Cleanfield (Cleanfield will be responsible for any funding shortfall)

According to Cleanfield the proposal may:

- Enhance the City of Hamilton's reputation as a green energy municipal leader.
- Potentially reduce the City's electricity costs.
- Reduce greenhouse gas (GHG) emission, by use a renewable technology.

Project Details as Proposed by Cleanfield:

The following is a list of key proposed project details, as proposed by Cleanfield.

- Cleanfield to install up to 150 Vertical-Axis Wind Turbines (VAWT)
- City of Hamilton to receive ownership of all 150 units

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- City of Hamilton and Cleanfield to mutually agree on the total number of buildings to be utilized for the pilot project (25 to 50 buildings)
- Buildings to be located in the downtown core, across the city and along the escarpment (together both parties will carefully choose locations for different wind properties and building heights).
- The turbines will be installed over a three to six month period
- Number of units installed per facility will range from one to two units
- Cleanfield will pay for all related maintenance costs for the first five years.
- Cleanfield will be working closely with OCETA/ETV Canada on test protocols to obtain a performance claim for different conditions.
- Cleanfield will determine CO₂ credits for the City.
- Cleanfield will also be working closely with McMaster University, to expand their current research and development relationship and contacting Mohawk College to perhaps participate in field measurement studies.
- Joint partnership opportunity (City of Hamilton and Cleanfield) to host/organize annually the largest renewable energy Trade & Consumer Show in Canada.

Direct Benefits as Proposed by Cleanfield

- No capital cost, liability or maintenance costs (maintenance for first 5 years) to the City of Hamilton.
- Cleanfield's VAWT can produce up to 9000 kWh/year per unit for a combine total of 1,350,000 kWh.
- Revenue potential is \$4.5 million over 30 year period.
- The City of Hamilton will have the option to select a Net Metering program or Standard Offer Contract program (Net Metering will provide the City with a production energy credit to offset electricity consumed).
- Cleanfield's head office and distribution centre will be located in Hamilton (Ancaster). Future opportunities to manufacture components or full turbines in Hamilton Cleanfield will be creating high tech jobs.

Potential Indirect Benefits as proposed by Cleanfield.

Extensive media exposure "Urban Wind Energy Project"

- Educational opportunities (local Elementary, High Schools, McMaster University and Mohawk College).
- Environmental benefits – reductions in greenhouse gas emissions.
- Kyoto Protocol – Hamilton's commitment to reducing greenhouse gas emissions.
- Long Term Benefits – Hamilton could become a Canadian and international renewable energy leader.
- The City could attract other renewable energy companies.

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- Hamilton could become a renewable energy research and development centre.
- A Renewable Energy Industry in Hamilton could create thousands of new jobs directly and indirectly relating to the industry (i.e. transportation, HR, legal, financial services).

Sample of the Proposed Small Turbine

<p>Product Specifications</p> <ul style="list-style-type: none">▪ Vertical Axis Wind Turbine (VAWT)▪ Rated Power – 2500W (2.5kW)▪ Weight – approx. 350 pounds▪ Height – 3 meters▪ Diameter – 2.5 meters▪ Power Output - up to 9000kW/h Annually▪ Low Maintenance - estimated life 20 – 30 years▪ 5-year Warranty▪ Designed for Grid or Off-Grid▪ Designed for Rooftops or Towers▪ Maximum nominal rotational speed: 250▪ Tip-speed ratio: 2-3▪ 2.5kW PM generator▪ Blade aerodynamic airfoil: Symmetrical NACA with four digits series	 <p>2.5kW VAWT</p>
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Next Steps

Given that the VAWT's are still in the developmental or prototype stage it will be necessary to ensure that proper due diligence is undertaken, before a recommendation can be brought forward to accept the Cleanfield offer. Staff proposes that we continue to work with Cleanfield on exploring this unique opportunity for the City and that prior to signing any formal agreements with Cleanfield, staff will bring a future report back to Council with details.

In addition to negotiating contract terms and conditions, staff will also be reviewing various technical aspects of the products to ensure public safety: operational and maintenance performance; site suitability; aesthetics; noise levels; zoning; overall benefits to the taxpayer; and, that all proper approvals are obtained by Cleanfield for the installation and operation of this product.

Cleanfield will be installing its first Canadian unit at McMaster this summer. McMaster will be doing extensive product testing over the next 3-years. Cleanfield also intend to install two additional units on the roof top of their new office, when it moves to Ancaster this summer.

ALTERNATIVES FOR CONSIDERATION:

Staff offers the following alternatives for consideration:

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- (1) The status quo is not recommended given the Cleanfield proposal offers a potentially unique opportunity to install new renewable wind technologies as a demonstration project in the City of Hamilton.
- (2) Proceed with the implementation as **proposed by Cleanfield** in this report. This alternative is not recommended by staff.

FINANCIAL/STAFFING/LEGAL IMPLICATIONS:

Financial:

There may be potential costs for external advisory services to assist City Staff in reviewing the technical, financial, environmental and legal merits of the proposal that are unknown at this time.

Staff will report back to Council on any financial implications to the City with respect to the Cleanfield proposal.

Staffing:

N/A

Legal:

Legal Services, Risk Management, Finance, Purchasing, Planning and Economic Development and Fleet & Facilities will have to work closely in order to determine the appropriate terms and conditions and the technical merits for any agreement to be entered into between the City of Hamilton and Cleanfield.

POLICIES AFFECTING PROPOSAL:

Purchasing POLICY # 6 - Policy for Unsolicited Proposals (1) Unsolicited proposals received by the City shall be reviewed by the Manager of Purchasing to determine if it is in the best interests of the City to follow a competitive process as outlined by the Purchasing Policy.

RELEVANT CONSULTATION:

Public Works Department
Fleet & Facilities Division

Corporate Services
Purchasing Division

Planning and Economic Development
Economic Development
Building and Licencing

CITY STRATEGIC COMMITMENT:

By evaluating the “**Triple Bottom Line**”, (community, environment, economic implications) we can make choices that create value across all three bottom lines, moving us closer to our vision for a sustainable community, and Provincial interests.

Community Well-Being is enhanced. **Yes** **No**

Public services and programs are delivered in an equitable manner, coordinated, efficient, effective and easily accessible to all citizens.

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Environmental Well-Being is enhanced. Yes No

As this is a renewable energy technology, the environmental well being of the City will be enhancing through emission reductions.

Economic Well-Being is enhanced. Yes No

Investment in Hamilton is enhanced and supported through the efforts of potentially reducing operating/utility costs and introduce a new renewal product that may enhance the City's reputation as a municipal green energy leader

Does the option you are recommending create value across all three bottom lines?

Yes No

Do the options you are recommending make Hamilton a City of choice for high performance public servants? Yes No

The recommendations in this report demonstrate the City's desire to set a high standard in attempting to maximize opportunities and to develop and endorse a sustainable energy management program.