The Ravina Project

Wind Research – Request for Proposal

Gordon Fraser B.A.
Director - The Ravina Project
75 Ravina Crescent,
Toronto, Ontario
Canada, M4J3L9

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Introduction

Theoretically, we know that wind power will complement solar power on a yearly basis. There is very little or no data published as to what this complementarity is. Gathering data from wind and combining it with the data gathered from solar will provide a real basis for thinking concretely about the future of wind/solar power in Toronto. It may even provide insight into its future in other large urban centers.

The Ravina Project wants to answer several wind related questions.

- What is the power density of wind at 25 meters in Toronto using a state of the art wind turbine?
- Is the wind power density large enough so that wind power should be considered by the urban householder as another clean source of power?
- Is the wind power density enough for local municipal governments to lift zoning laws regarding tower heights in neighbourhoods?
- Twenty-five meters is about the hub height for a larger wind turbine that could be deployed adjacent to municipal buildings and schools. Does the data collected by The Ravina Project suggest that such alternative forms of energy should be considered by municipal governments and boards of education?
- The complementarity of wind and solar power are well established in the mythology of clean power generation. What exactly is this complementarity in real data terms on a month by month basis in a dense urban neighbourhood?
- Can an old but upgraded house in Toronto using a reasonably sized solar power collector and a reasonably sized wind turbine at 25 meters generate enough power to go off-grid?
- Can a modern wind turbine survive a series of Canadian winters?
- How much does the wind turbine and its associated technologies cost to install and to maintain over 60 months?
- How reliable is the wind turbine and its associated technologies in terms of the number of hours/days a year it is unusable due to: auto shutdown, manual shut down, maintenance issues or system upgrade / re-configuration?

The Ravina Project intends to install a Skystream 3.7 wind turbine on a 70 foot lattice, self-supporting tower and collect generation data.

Note that this installation will have the highest profile both in the neighbourhood and in the city. Pictures and video of various aspects of the project will be taken for posterity and WEB site use.

The Ravina Project has a 1.5 kW solar research installation that has been producing data since November 1st, 2006. The addition of the wind installation will allow The Ravina Project to include wind in its overall green power research and data collection program.

Tower Selection and Installation

The Ravina Project has worked with Josh Lange joshl@trylon.com at Trylon TSF who has contacted Southwest Wind Power and selected a tower size that will be appropriate for the Skystream 3.7. All proposals will quote this make and model of tower.

The tower will be located at: 43 degrees, 40’ 44.50” North Latitude by -79 degrees, 20’ 18.09” Longitude. These co-ordinates are from Google Earth.

Tower Model and Accessories

The proposals will include the tower and associated accessories listed below:

70 foot Trylon Super Titan P/N: 5.94.0600.070
Cable Safety Climb Kit P/N: 4.99.0485.100
Step Bolt Kit P/N: 4.98.0100.070
Anti-climb Shield P/N: 4.92.0001.012
Tower Grounding Kit P/N: 4.91.0103.000
Safety Cable Slider and Karabiner P/N: 4.99.0101.001

The tower shall be installed to industry (CSA) standards with respect to the tower anchor/base, grounding and any special bolts, pal nuts or bolt tightening methods recommended by the tower manufacturer. On the Super TITAN self-support towers, it is critical that splice bolts be installed properly using the turn-of-the-nut method. Pal nuts must also be applied to all bolts. The tower base shall be anchored in the ground using technology commensurate with its soil class. If access to the property is required for ASTM D1586-84 or other types of soil and/or penetration tests, indicate the length of time required.

The tower shall be painted leaf green before being erected.

Grounding of the tower and wind generator shall be accomplished according to the manufacturer's recommendations. They shall be integrated into the existing grounding / bonding system already in existence.

Property Access

Access to the property in and around the tower base is important. There is a public access lane way directly behind the property. There is room enough for a crane or cement delivery truck to operate in the lane way. There is a gate in the fence behind the property that will allow cement to be poured directly from a truck into the support base. There is access from the front of the property for a miniature mechanized back hoe. There are no obstructions above the tower base nor above the public access lane way.

Wind Turbine

Installation

The wind turbine to be installed is the Skystream 3.7.

The turbine will be mated with the appropriate diameter of schedule 40 steel pipe which will act as a seven (7) foot extender. This will result in the center of the hub being about 8 feet above the top end of the tower. The resulting height of the hub is about 23.77 meters above ground level.

The turbine will be assembled, tested and mounted on the tower in such a way that no warrantees are voided.

Power from the wind turbine shall be conducted using the appropriate diameter wires from the wind turbine as 240 V AC to a clearly labeled breaker switch in the existing power room. From that breaker switch the power will pass through a kWh meter which, at a minimum, will track as a running total, the kWh output of the wind turbine. From the meter the power will run through a step down transformer (220 V to 110 V) and on to the existing protected sub-panel which is

connected to the 120 AC output of the existing Xantrex SW 4048 inverter/charger. See circuit diagram on page 4 below for more details of the existing configuration.

Accessories

Accessories included in this installation are:

- Wireless Remote display
- USB Converter
- Battery Sensor
- Data Logger Software.

The battery sensor configuration shall be integrated with the existing batteries and the existing set points for battery float, bulk and absorb voltages on the model MX-60 Outback solar charge controller.

The wireless remote shall be set up and tested according to factory specifications.

No setup or configuration for the USB converter or *DataLogger* software is required.

Proposal

Please include in your proposal all information associated with:

- estimate of the expected per year maintenance costs or the yearly cost of a maintenance plan,
- estimate of the time per year The Ravina Project must spend in maintenance tasks associated with this installation,
- costs associated with guarantees and warrantees,
- a project plan with a timeline from contract signing until completion,
- what industry accepted inspection/certification will be provided by your company for this tower installation?
- what specific training has your company received in the assembling, testing and mounting the Skystream 3.7 wind turbine?
- provide number of Skystream 3.7 installations your company has completed,
- the number of tower installations similar to the size, type and configuration in this proposal, that your company has completed,
- what insurance coverage does your company employ during this type of project?

Proposal submission deadline is August 21, 2007, 23:59:59 EDT. Note that if the proposal is sent to us via e-mail we will also require a hard copy version. If an e-mailed copy of the proposal reaches us before the cutoff date and time, the proposal will be deemed to have met the cutoff time. However, in this situation the hard copy of the proposal should reach us within 3 business days or the proposal will not be considered.

Proposals may be sent to: gord@theravinaproject.org and be sent to the address:

The Ravina Project
75 Ravina Crescent,
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Canada M4J3L9

The Existing Circuitry at The Ravina Project