

City of Burlington Wind Turbine Impact Study Proposal

Proposed is a complete impact study for generating electrical energy using wind turbines at two sites within the city limits of Burlington, Vermont. The sites selected are on the campus of the University of Vermont and on the Rock Point property owned by the Episcopal Diocese of Vermont, next to the Burlington High School. Both sites are publicly accessible and show excellent wind and educational potential. These sites would be ideal for demonstrating the effectiveness of the wind turbine technology. The impact study will address the following questions with defensible technical, scientific, social and economic analyses:

- How much power could be generated at each *specific* site using different sized turbines based on field data collected for this study?
- What perceived impacts will the proposed turbine have on community members who live, work and recreate near the proposed installation sites?
- How can the data collected for the study be used for educational purposes (i.e. website, university and high school classes)?
- What are the installation and maintenance costs for the different sized wind turbines, how long would their payback period be and what other economic benefits would be derived from them?
- What are the potential environmental impacts of wind turbines to the current ecosystem including bird interactions?

These questions need to be answered before a turbine can be installed within the City of Burlington because of the large number of stakeholders involved in placing a wind turbine in an urban setting. The results of all studies will be summarized into a single two-page document that can easily be posted on any number of websites. The study will be conducted specifically for small- to medium-scale wind turbines that are now commercially available.

The power-generation potential for each site will be quantified by Draker Solar Design, LLC using a research-quality data acquisition system. These data will be posted directly to the web using a dedicated webserver. The data acquisition system can be easily reused if wind turbines are installed at a later date in order to broadcast turbine performance data. Performance data include power generation, wind speed and direction, noise levels, temperature, relative humidity and barometric pressure. The data-acquisition systems will be run using small photovoltaic (PV) modules and will be installed to minimize vandalism potential. Draker Solar Design, LLC of Burlington, VT will design, install and calibrate the data-acquisition system integrating equipment purchased from NRG Systems of Hinesburg, VT.

A series of public meetings will be held within Burlington to outline the proposed turbine installations and gauge public sentiment. These meetings will provide an opportunity for interested citizens who may be impacted by a turbine installation to debate and discuss the relative merits and drawbacks of such installations. All impact study participants will be available to present their research and answer questions. Additionally, wind industry representatives will be invited to participate so that they may provide insights based on prior wind turbine installations in other urban settings. A public comment period will be established during which written comments will be accepted by the impact study committee. These public forums will, at the very least, begin a valuable community discourse about alternative energy options for the Burlington area.

A 'live' website will be designed for educational purposes. The environmental and social data collected for this study will be processed and formatted in a manner that are useable to both the general public and students studying renewable energy. The goal of the website is to bring about a better understanding of how wind turbines perform and what their impacts would be. The environmental data will also be used for wind turbine sizing exercises at the University of Vermont.

The Field Naturalist Graduate Program at the University of Vermont will conduct a study of the potential impacts of wind turbines on birds. Dr. Jeffrey Hughes, director of the program, will lead the research to (i) characterize diurnal flight patterns of species at risk (e.g., raptors), and (ii) assess possible impacts of wind turbines on birds during spring and fall migrations.

The economic analysis from an accounting standpoint will be performed by... The analysis will include an expected return on investment for the wind turbines using current Burlington Electric rates. Burlington Electric has tentatively agreed to do this study depending on approval.

This study is of local importance and can be used by others nationally and world-wide who are interested in assessing the impact of medium-sized wind turbines in urban environments exhibiting good wind potential.