Énergie NB Power

The LEED Standard and Renewable Energy

In the fall of 2006, a new district ranger station for the Provincial Department of Natural Resources was built in Florenceville. In response to the growing need for environmental stewardship, they constructed the project using the Leadership in Energy and Environmental Design (LEED) Green Building Rating System implemented by the Canada Green Building Council.

The LEED rating system has been adopted in most jurisdictions across Canada. All new buildings for the provincial government will be designed to a LEED Silver standard. Click here for more information at The LEED Canada Green Building Rating System.

The Government of New Brunswick (GNB) piloted the new ranger station as a project to further their knowledge and experience in the design and construction of high performance buildings. The project was also a learning experience for NB Power as New Brunswick's second net metering project.

LEED projects are rated on a point system - the greater number of points obtained by a building project, the more green principles. In the winter of 2007, the Florenceville project achieved the LEED Gold certification, with a final score of 41 out of a possible 70. To obtain this certification, the project incorporated many energy efficient systems (geothermal heat pumps, energy efficient lighting and sophisticated lighting controls), responsible site development, water efficiency, use of environmentally friendly materials and provided a high quality indoor environment for its occupants with daylighting and indoor chemical pollutant control.

As part of the LEED 'energy and atmosphere' criteria, a building could earn points for using renewable energy sources. By installing a wind turbine and choosing to net meter with NB Power, the facility was able to claim points toward the LEED Gold certification.

Choosing a Location

Once GNB determined wind as the renewable energy source and established a targeted amount of energy to be supplied, the Department of Supply and Services led by Manager, Electrical Design, Endre Raduly, chose a site in Florenceville that had adequate wind speeds. The wind speeds had been recorded in this area and this data provided the information required to choose the proper wind turbine and height of the tower to achieve the targeted energy values.

During the construction of the $1.3 million building, GNB consulted NB Power's engineering team to make sure net metering would be permitted. After this was confirmed, GNB ordered a 10 kW wind turbine, which would allow them to meet the LEED target of having 10-15 per cent of the building's energy coming from a renewable source. The turbine was installed on a 24-meter lattice tower to ensure it would be exposed to adequate wind speeds.

Overall, construction on the wind turbine (including soil analysis and laying the foundation to ensure the tower would not sink) took about one month to complete and two days to raise the tower. A licensed electrician did all of the electrical installations. GNB then contacted NB Power to help with the net metering application procedure.

Technology, Safety and Challenges

Because small wind installations and net metering technology were relatively new, GNB expected challenges. One of the goals of the project was to experience these challenges, resolve them, and make the process a little less challenging for the next person. As more people use renewable energy sources, experts and contractors will gain the experience necessary to avoid these challenges in the future.

One of the challenges GNB met was with the inverter that was supplied with the turbine, as it was not compatible with the voltage that their facilities required. GNB contacted University of New Brunswick's Dr. Liuchen Chang to build a new inverter with the proper voltage output. Dr. Chang also worked on the Falls Brook Centre net metering project, the first in New Brunswick.

Another of the challenges GNB encountered was the required CSA approval for the wind turbine equipment. This step is necessary to ensure public safety. Net metered generation cannot be connected to the electrical grid unless all equipment has proper certification.

Since the implementation of this net metering project, some fine-tuning has been necessary, which has brought the turbine offline several times. Otherwise, the electricity output has been quite consistent.

Successful Completion

In July 2006, the wind turbine at the Florenceville ranger station was brought online. There are still a few technical challenges to overcome. However, GNB is confident that the turbine will continue to work efficiently in the years to come.

GNB estimates that the turbine's energy output amounts to approximately 27.8 per cent electricity savings for the building. The total cost for the turbine and its installation was about $80,000.

Lessons Learned

Before considering installing renewable energy for your home or business, Mr. Raduly suggests first making your home or building as energy efficient as possible. It is more cost effective to save energy through building efficiency than installing renewable energy sources. Both activities will help the environment and help to lower your power bill.

If you choose to net meter, remember that the process for installing a renewable energy system can be lengthy. Time is required to install your system safely whether it is a solar panel, a wind turbine or another renewable energy source. Ensure that your contractors are properly licensed and that they acquire the neccesary electrical permits and certfication requirements required.

If you are installing a wind turbine, Mr. Raduly recommends testing the average wind speeds in your area to ensure that an adequate and consistent amount of electricity can be generated. It is important to test the soil to ensure the tower is properly anchored. Electrically, the system needs to be designed by professional who is familiar with code requirements and who can ensure that the local inspection authorities are involved from the start of the project. Finally, once the turbine is installed and online you should expect to monitor it weekly or monthly to ensure it is working properly.

For More Information

Contact us at 1-800-663-6272 to learn more about net metering and energy conservation. We are happy to help our customers learn about this renewable energy option and we will provide you with up to date information to help you make the best decisions possible.