



New Brunswick's First Net Metered Site: Falls Brook Centre

In February 2004, with funding from the Government of Canada's ecoACTION Program, New Brunswick's first netmetered site was established in the rural community of Knowlesville (near Hartland). The collaborative effort - a three-way partnership between the Falls Brook Centre (FBC), NB Power and UNB's Sustainable Power Research Group - was designed to be an educational project. Since then, the site has hosted many visitors who flock to see the demonstration site each year, and has served as a learning model for all three partners involved in the project's construction.

Each partner approached the project as a learning opportunity. While FBC wished to discover the environmental benefits of renewable energy and energy efficiency, NB Power had the additional goal of gaining direct knowledge of how to connect small renewable technologies to the electric grid safely and efficiently. Two years after they began, success was achieved when a small 520W solar photovoltaic module array (solar panels) and a 3kW wind turbine were attached to the electrical grid.

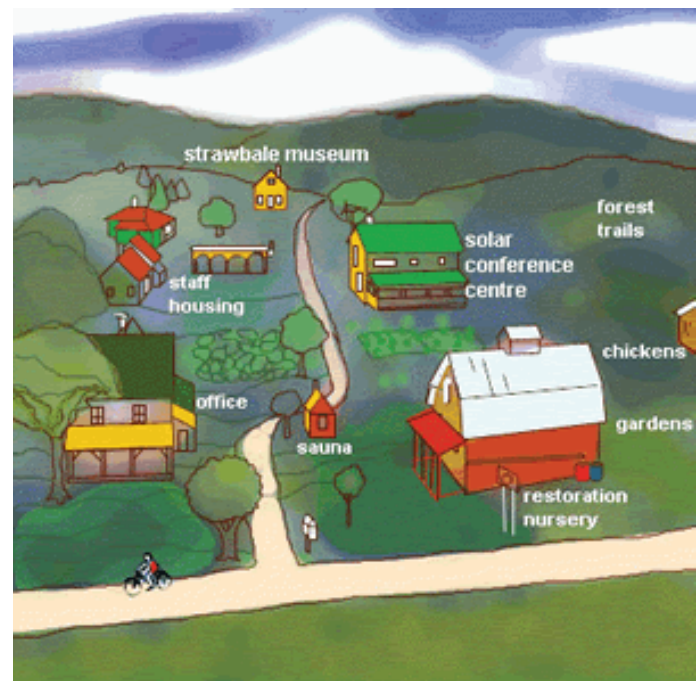
Though net metering was new to the industry at the time, the learning achieved on this project allowed NB Power to develop New Brunswick's first net metering program to benefit other customers who want to follow Falls Brook's lead.

Choosing a Demonstration Site

FBC was the ideal location for New Brunswick's first net metering site. FBC was established in 1992 as a non-profit, charitable, and community-based education tool under the initiative of Jean Arnold and other environmentalists. Today it covers four acres of land with a staff devoted to demonstrating and promoting the possibility of sustainable living in Canada. FBC successfully uses the site to highlight net-metering technology to hundreds of visitors each year. It also hosts summer energy workshops to encourage interest in renewable energy.

FBC netmetered a three-bedroom farmhouse complete with modern conveniences such as a clothes washer, electric water heater, refrigerator, and an electric range. The initial goal was to create equilibrium sustainable housing - to produce as much energy as you use per year.

To achieve this objective they needed to focus on energy efficiency, reducing electricity consumption as much as possible. They implemented conservation measures such as energy efficient lighting, a solar-thermal water heating system to offset hot water consumption and wood heat supplemented with oil heat. Net metering with NB Power allowed them to have grid-supplied electricity when renewable sources were not operating.





Technology and Challenges

A solar panel array, consisting of four 130W modules, was installed at an approximate cost of \$6,000. Despite its technical challenges, the process of connecting the solar panels to the house and then to the grid went smoothly (only a licensed electrician can do this type of work). Since coming online in spring 2004, the solar array has been flawlessly producing an average of 50 kilowatt hours of electricity per month (about \$60/year). The only maintenance required to date is to reposition the array's angle to the sun twice a year (once in the spring and again in the fall).

The wind turbine installation posed a few more challenges. Before the wind turbine was purchased, average wind speeds were measured for twelve months. Average wind speed calculations are very helpful in choosing the best location and estimating how much electricity the turbine is expected to generate. Ideally, the turbine should be installed in a location with the highest possible wind speed to produce as much energy as possible.

Wind speeds were a bit disappointing, but the three partners decided to continue the project as its primary use was for demonstration purposes. A 3 KW turbine was installed and currently generates approximately 150 kilowatt hours of electricity per month (approximately \$180 per year).

In 2004, the availability of equipment was limited due to the relative novelty of net metering. The largest challenge encountered was obtaining an inverter that connected to the electrical grid. FBC called upon the help of University of New Brunswick Professor of Engineering Dr. Liuchen Chang and his UNB Sustainable Power Research Group. They developed a Grid-Tie inverter that was compatible with the turbine. Although eventually replaced due to technical problems, it made it possible to bring the turbine online and was a significant achievement in net metering technology. The wind turbine has not operated as flawlessly as the solar array, but despite some maintenance requirements has been working well in recent months.

Successful Completion

The Falls Brook project took two years to complete successfully. Today, the turbine and solar array continue to produce environmentally friendly electricity, and three organizations came together to jointly resolve problems and gain experience.

The result: The first successful completion of a net metering site in New Brunswick .

The benefit to our customers: NB Power gained enough experience to develop and implement a net metering program of our own.

Advice and Responsibility

Before deciding to enroll in the net metering program, it is important to ensure that your house is as energy efficient as possible. Reducing electricity use in the home is the most cost effective way to reduce emissions. Using less electricity in your home will also allow you to buy smaller less costly renewable equipment. Be sure to purchase proven renewable technology and consider only buying products from companies that provide a list of satisfied customers.

Remember, wind turbines and solar panels are still relatively new technologies, so don't expect faultless equipment. Although new products are available every day, net metering in New Brunswick is still in its initial adapting stages. Use licensed and experienced electrical contractors to ensure work is done to CSA standards and the Canadian Electrical Code. The technical difficulties for both solar and wind power must be left to experts who can have you ready for net metering as quickly and safely as possible.