

NORTH BRANCH SMART ENERGY NEIGHBOURHOOD

Research Project Information for Homebuyers

What is the North Branch Smart Energy Neighbourhood?

To build tomorrow's power grid for New Brunswick, we need to research and test future technologies right here at home. A modern grid is going to be smarter, greener, more resilient and efficient, and we're extremely pleased that North Branch is partnering with us to help create a new energy future for our province!

The North Branch Smart Energy Development Project in Moncton is part of a four-year federally funded research and demonstration program called Smart Grid Atlantic (SGA). SGA is aimed at determining how smart energy technologies and small-scale renewable energy installations can provide customer, community and provincial benefits – like being better able to withstand and recover from extreme weather events, while reducing our energy use and our carbon footprint as individuals and as a province. SGA is working on smart energy community projects with several communities in Atlantic Canada, and the brand-new North Branch development is one of them!

Who is involved in the research project?

Smart Grid Atlantic partners are NB Power, NS Power and Siemens. The federal department of Innovation, Science and Economic Development Canada (ISED) is helping to fund this important research.

The North Branch Smart Energy Neighbourhood project is partnering with Solaire Homes to build a small community of net-zero ready homes enabled with smart home energy technologies.

Siemens will develop new technology platforms that will help manage the energy systems for homes and the North Branch neighbourhood overall. This includes nanogrid technology that will manage energy consumption within your home, and microgrid technology that will manage the nanogrids in all the homes.

With this broad partnership between industry, electric utilities and government, what is created and tested here in NB could become the model for the use of this kind of smart energy technologies for homeowners and communities around the world.



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Why should I take part in this research project?

As someone purchasing a smart energy and “zero-energy ready” home at North Branch you have demonstrated that you are committed to sustainable energy. As an early adopter of smart home technologies that can help you to save energy and money while reducing your carbon footprint, you know the value of good energy investments. And participating in this project provides you with the opportunity to purchase a subsidized technology package that will provide you with a roof-top solar system for a significant savings over the typical market price, and a smart energy storage battery at no cost to you!

NB Power and our partners would like to help you maximize the benefits of your new home by working with you to better manage your energy use through energy monitoring and optimization systems, and introducing new exciting concepts such as home-to-home energy trading.

By participating in this project, you will help us to better understand how technologies such as solar panels, battery storage, and home energy management systems can be better used to help you to reduce your energy consumption; manage the overall energy usage in your community to make it more self-sustainable; and help the utility use more renewable energy and reduce carbon emissions.

What are you trying to learn at North Branch?

Every year, more homeowners – such as yourself – are choosing to build new, highly energy efficient smart homes. These homes use significantly less energy than existing homes in NB, and even many other new homes. As the way we use energy changes, thanks to modern building practices and technologies, so do the systems that support these homes. Products such as rooftop solar, smart home batteries for energy storage, smart thermostats, and heat pump water heaters help you to use less energy within your home. And if we can find ways to synchronize those systems to operate in harmony, we may be able to reduce the overall energy consumption of your community as well, which means less energy needed from electricity generation facilities that burn fossil fuels.

That’s the whole concept of a microgrid: instead of a big power plant feeding electricity into your home and your community, NB Power would like to investigate if communities such as North Branch can be made self-sustainable at times of day and year when there’s lots of solar energy potential. And with the addition of batteries for storing this energy, can those technologies help the utility use less fossil fuels at times of day and year when the sun doesn’t shine (like early morning or on a cold and cloudy winter day)?

Being able to create a community microgrid, where all of the homes work in unison to balance their energy consumption based on what is generated from the rooftop solar and stored in the batteries in the community, requires smarter energy usage within the homes, too. This is why we’re introducing nanogrid technology into the homes to help coordinate your solar production and battery storage.

You may be wondering “if my home is already net-zero thanks to all the insulation and the solar panels, why do I need you to manage my energy systems?”. This is where some new concepts like home-to-home energy trading come in. What if you could sell electricity you’re not using to NB Power, or better yet, share it with your neighbours? This is the type of research we would like to do with you as a homeowner in the leading-edge North Branch neighbourhood!



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What smart energy technologies will be installed in my home?

SMART SOLAR PANELS THAT CAN BE BETTER INTEGRATED INTO THE GRID

When it comes to managing electricity systems, NB Power has over 100 years of experience! But our systems are designed to have large electricity generation assets and the ability to transport electricity through transmission and distribution systems to homes and businesses throughout the province. As more and more customers start to generate their own electricity, adjustments need to be made to how the overall electricity system operates. For starters, it's hard to manage something you can't see! Since NB Power does not know how much energy is being produced by rooftop solar panels, it's difficult to coordinate the benefits of this technology with the rest of the system. This is why at North Branch we'd like to monitor exactly how much electricity is produced by the panels at different times of day or year, and how much of it goes into your home or back to the power grid.

SMART BATTERY FOR ENERGY STORAGE

Unlike a basic battery (energy storage) system that is only available for back-up power, smart home batteries bring a layer of battery control, such as being able to program them to charge or discharge (or draw on) this electricity at certain times of day. This smart functionality we're enabling for your battery is similar to how you'd use a programmable thermostat: you want the temperature to be higher at times of day that you are awake or at home, and lower at times of day that you are asleep or at work. Using the energy management technology, we'll do the same with your battery: we will determine what times of day you need the most energy and program the batteries to make sure they are fully charged and ready to send energy into your home when you need it. This means we can help you do things like store excess solar energy in the battery and use it to offset the amount of energy you purchase from the grid at other times of the day! The batteries will also help enable home-to-home energy sharing in North Branch, and most importantly, to allow you to keep your essential home systems operating in the event of a power outage.

What else are you researching in the North Branch project?

CREATION OF A NEIGHBOURHOOD MICROGRID

As described above, each home in the North Branch neighbourhood acts as their own nanogrid, so when we put all these homes (nanogrids) together we create a neighbourhood microgrid with benefits of using local and renewable energy! And a microgrid allows you and your neighbours to act as 'energy prosumers' vs just consumers - to generate, store, and take part in home-to-home energy sharing, and the opportunity to sell electricity to NB Power. These concepts are described in more detail below.



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A HOME-TO-HOME ENERGY EXCHANGE AS PART OF THE MICROGRID

As described above, smart energy technologies provide homeowners and their utilities the opportunity to take advantage of smart features and innovative programs. Although the home-to-home energy trading model we'll be testing at North Branch will be a first for Canada, the concept is being tested in other jurisdictions as well. The challenge for utilities in managing these programs is they need to be able to see and control the solar and battery output and how much energy it is providing to the grid. Since we're installing the latest in smart energy management systems, we intend to realize greater benefits than others who have tried it before using more basic technologies and lacking information to make the right decisions.

The home-to-home energy exchange program we will be testing is designed to provide benefits to all New Brunswickers and create opportunities to realize additional value from your smart energy technologies. In addition to sharing energy with the neighbourhood there will be opportunities to send electricity back to NB Power for compensation or credit.

With this research, NB Power is studying ways to address one of its fundamental problems; that NB Power's true cost to produce electricity differs depending on the time of day and time of year it is generated and on the generation source. So, as part of this research project we'll be looking to determine how we can use your smart home technologies to better align your energy usage to the lowest cost and lowest emissions generation source. One way we expect to do this is by charging your batteries at night when electricity prices are low, and then using the battery to power your home in the morning (before the sun is up) when electricity is more expensive.

What are you asking me to do?

1. Agree to participate in the research. If you are intrigued by what we want to create in North Branch, and are open to helping us to test new technologies and programs, and determine how to maximize the benefits of more home-based renewable energy on the grid, we'd love to have you involved!
2. Purchase the subsidized technology package that will provide you with high performance solar panels and a smart inverter for a significant savings over the typical market price.
3. Let us install the battery and nanogrid technologies in your home, at no cost to you.
4. Let us monitor your energy usage.
5. Participate in a home-to-home energy exchange program and associated compensation models.
6. Answer up to 4 surveys a year. We want to hear from you! NB Power would like to get your feedback on what you think of the technologies and research programs you are involved in, as described above. And of course, what your overall experience is like living in this smart energy neighbourhood!



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How long will I be involved in the project?

This demonstration project lasts until March 2024, however, the homes and the technology will last much longer than that! We are asking homeowners to commit to participating in some form of research or ongoing engagement in the microgrid community for 5 years from the date you enter the project. You officially enter the project upon signing of the Research Participation Agreement, however, the research period will not begin until your home is built, all smart energy technologies are installed and commissioned, and you have taken residence.

What information will you collect about my household?

- Electricity meter data
- Solar and battery systems operations
- Energy monitoring of critical loads such as heating system, water heater, and appliances
- Your answers to surveys about the technology and your perceived benefits of being involved in the research

NB Power and Siemens will have access to your data for research purposes.

What happens when the project is over?

As the first microgrid-enabled community in New Brunswick we anticipate there will be opportunities to do additional technology demonstration and research projects well beyond the term of this project. Once this project is over, you will own your solar panels outright, however the battery will remain the property of NB Power until 2029. You have the option of keeping the battery in your home – at no cost to you - and continuing to participate in this unique microgrid community, or we can remove the battery and nanogrid controller and disconnect you from your neighbors. You don't need to decide now; we will reach out to you at the end of the project to discuss next steps with you.



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