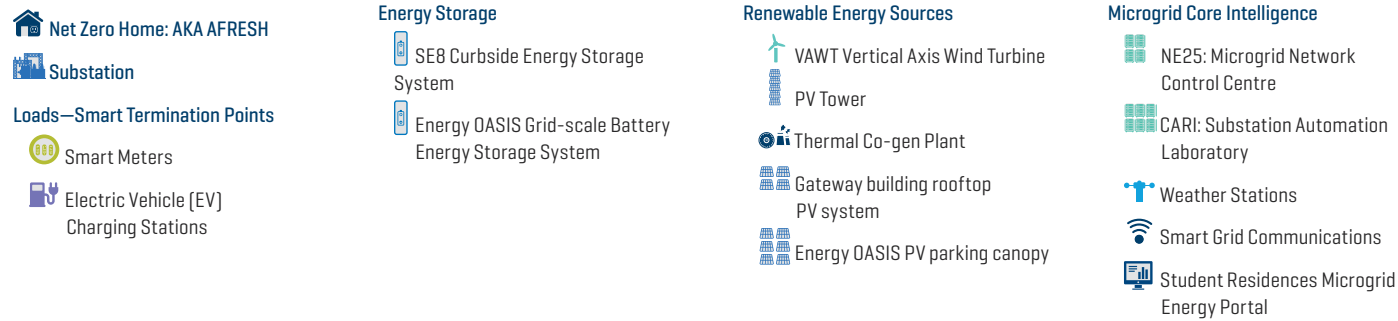
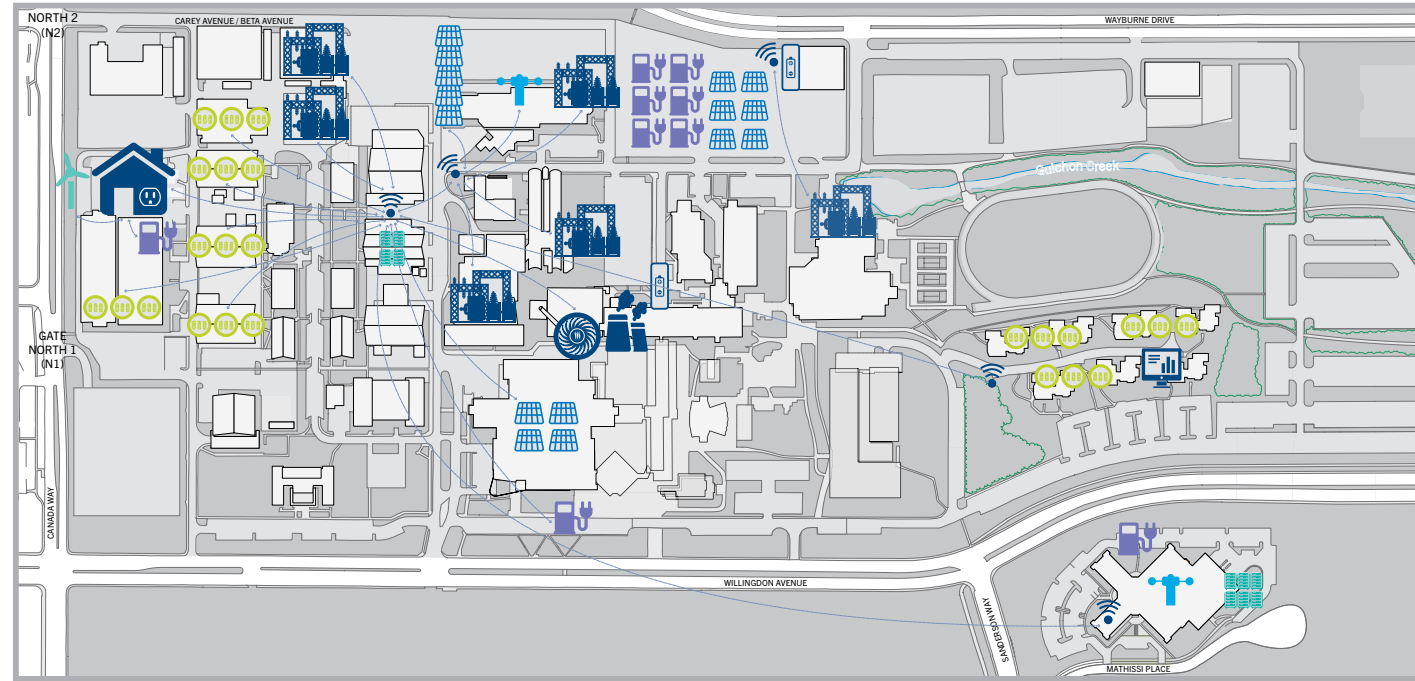


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SMART MICROGRID
TECHNOLOGY

**ENERGY INNOVATION
FOR A COMPLEX WORLD**

BCITTM

BCIT – BC Hydro Smart Microgrid



What is a Microgrid?

Simply put, a microgrid is an efficient, cost-effective and environmentally responsible way to produce, store and distribute energy for the new millennium.

Smart technologies enable legacy grids to incorporate renewable sources of power generation, reduce energy losses and increase the resiliency and reliability of electrical grids. Clusters of such smart technologies, organized as scaled-down versions of electricity grids, are called smart microgrids. Smart microgrids incorporate the most basic components of an electricity grid (such as load centers and power sources) working in close proximity, and without the need for expensive transmission assets. The degree of sophistication of the overarching command, control and protection in such systems determine their level of “smartness”.

Smart Microgrids: Unlocking Economic Potential

Environmental, economic and political issues in the latter half of the last century have made it challenging for the electrical utility industry to continue with the status quo. Considering the operational and economic challenges that are now being faced, the industry has begun to look beyond current technologies toward a future that contains more innovative and sustainable energy options. The socioeconomic benefits of adopting this technology are significant – from environmental sustainability, to job creation, to the expansion of services into rural, Indigenous and off-grid communities. Smart microgrids provide the infrastructure to build stronger societies – both today and for generations to come.

The BCIT Solution: Making a Difference

There is no singular design for all microgrid solutions. The factors involved in determining the right fit for each individual system or community are complex and varied – from geographical size and diversity, to urbanization patterns and economic realities in developing microgrid solutions for energy providers or communities in need.

The smart microgrid on the BCIT campus enables Canadian regulatory agencies to experiment with, and validate, various standards, protocols and frameworks suitable for Canadian applications. It also provides electrical utilities with a unique test-bed to verify and validate variations of smart grid technologies and solutions that suit their jurisdictions and their specific requirements before such solutions are implemented in the field.

Access to the virtual working environment of the BCIT smart microgrid also provides private sector partners with opportunities to incorporate such technologies into their existing products or develop new portfolios of products.

Smart microgrid technology provides solutions to overcome obstacles that have hampered the modernization of the electrical industry in Canada and around the world. Future products, technologies, standards, regulatory frameworks and implementations to be developed will accelerate the systemic and sustainable reduction of greenhouse gas (GHG) emissions, addressing the global issue of climate change. Working with local engineering firms or NGOs, BCIT can advise and help design smart microgrid solutions for infrastructure that will have a positive, long-lasting impact.

Accolades for the BCIT Energy OASIS

“This project is a demonstration of how clean technology can help reduce emissions, protect the environment and generate employment opportunities. I congratulate [BCIT] for being early adopters of electric vehicles and their supporting infrastructure. Projects like this are a beacon of innovation in the Canadian clean energy industry, which our government will continue to support.”

The Honorable James Gordon Carr
Minister of Natural Resources Canada

“British Columbia is a world leader in clean energy, with 98% of our system already clean or renewable. Solar is a great part of our mix and the Energy OASIS project will make an important contribution to understanding the impact of new technologies on the grid.”

Kip Morison
Chief Information Officer
BC Hydro

Research and Development

Canada’s Natural Sciences and Engineering Research Council (NSERC) supported BCIT microgrid research by providing \$5 million to establish the NSERC Strategic Network for Research in Smart Microgrids (NSMG-Net). This network includes nine research universities from across Canada, various public and private research institutes and more than 20 high-tech companies, using BCIT’s smart microgrid as the basis of its infrastructure. This is Canada’s very first national network for smart grid research and development.

No other post-secondary in Canada has been able to provide its students and faculty with such leading-edge, utility-grade and virtual microgrid research and development infrastructure.

This innovation is due to the support provided by our gracious funding partners.

NSERC	NB Power
BC Hydro	Siemens
Hydro One	Schneider
NRCAN	ABB
Hydro Quebec	EPRI
Manitoba Hydro	Panasonic



Expertise and Support

Given our considerable experience in the design of technologies and solutions for smart microgrid applications, and using the collection of resources, expertise and technologies developed as a result of decades of publicly funded research and development, BCIT is able to offer custom design and consulting services nationally and internationally in the following fields:

For Energy Providers and Utilities:

- Operational Efficiency—including Volt/VAR optimization, conservation voltage reduction, substation automation, load balancing and demand response
- Distributed Energy Resources (DER)—including integration and control of intermittent sources of energy, such as wind, solar, etc.
- Quality of Service Improvement—including Advanced Metering Infrastructure (AMI); loss, theft and tampering detection and control, and customer portals

For Energy Consumers and Communities:

- Energy Management—including load management, cost reductions, etc.
- Energy Reliability and Security—including redundancy and smart distribution
- Rural Electrification—including turn-key system design for electrification of off-grid and rural communities, campuses, forward operating army bases, etc.

Learn More

Contact our Applied Research team to discuss your unique microgrid needs.

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Applied Research and the NSERC
Smart Microgrid Network