

ALBERTA INNOVATES

CLEAN ENERGY

CLEAN TECHNOLOGY

RENEWABLE AND ALTERNATIVE ENERGY – CLEAN POWER AND HEAT

FUNDING DETAILS

Internet of Energy for Smart Grid Implementation in Alberta

Connect-X is solving acute and growing electricity grid instability by creating an Internet of Energy which enables planning, design and control of electricity consumption and on-demand supply without building additional power plants. Connect-X is developing their Energy Management and Operating Platform (EMOP™) to enable utilities and grid operators to connect, aggregate and operate consumers' energy loads and onsite power sources (also known as Distributed Energy Resources or DERs) on a Cloud platform. The resulting "Internet of Energy" network will enable dynamic balancing of power supply and demand, helping to ensure electricity system reliability and resiliency.



RECIPIENT:

Connect-X



PARTNERS:

**Red Deer Polytechnic,
Northern Alberta
Institute of
Technology**



TOTAL BUDGET:

\$665,296



AI FUNDING:

\$250,000



PROJECT DATES:

**APR 2024–
SEP 2025**



PROJECT TRL:

**Start: 3
End: 8**

INTERNET OF ENERGY FOR CONNECTED BUILDINGS



APPLICATION

Most DER management systems are either monitoring software or asset management systems that still require large client teams to manage and operate VPP. The Connect-X automated operating system integrates both functions and will enable utility companies and grid operators to run end-to-end planning, design, and operation of virtual power plants (VPPs). This technology is intended to be industry's first OEM-agnostic, real-time, fully autonomous VPP operating platform and is designed to allow VPP expansion without worrying about manufacturers and types of Distributed Energy Resources (DERs).



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PROJECT GOALS

- Validate the OEM agnostic technology for connectivity, controllability, scalability, affordability;
- Validate speed, efficacy and accuracy of EMOPTM energy optimization decisions, and level of autonomy t as a no-touch operating system;
- Validate EMOP's ability to detect and deter cyber threats in smart grid systems, and to operate during power outages;
- Develop a scaled simulation of the province's smart grid potential and its impact on grid stability, and economic and technical criteria for province-wide smart grid implementation; and
- Develop roadmap for implementing a Time of Use tariff for dynamic electricity pricing.

BENEFITS TO ALBERTA

- Advancing smart grid commercialization helps ensure electricity affordability in Alberta by deferring major capital investment in electricity grid upgrades and new power plant build out.
- Improved reliability and resiliency of power grid and avoidance of supply disruptions increases energy security for communities and businesses.
- Carbon footprint reductions of over 200,00 MTCO2e per year just with 90 homes, with associated higher reductions with expansion to numerous homes.
- Improved management and operation of power grid in the province due to increased demand visibility and automated power flows.
- Platform enables partnerships between consumers and their power providers to enable consumers to contribute to achieving grid stability.



2 Patents



2 Students
Trained



4 Project Jobs



11-100
Future Jobs



1 New
Product/Service



Enabling Project
GHGs Reduced



Enabling Future
GHGs Reductions

CURRENT STATUS

MAY 2025

Project has progressed through 3 phases of ConnTrol-ED™ firmware and ConnTrol Operating System development. First release of Energy Optimization module and Energy Management and Operating System (EMOP™) module tested in 5 homes. Various tests completed at NAIT Centre for Grid Innovation, such as OEM Agnostics Test and ED-Tuner Test. Phase 4 is ready for deployment at host site, once operating agreement is in place.