



ALBERTA INNOVATES

CLEAN ENERGY

CLEAN TECHNOLOGY

ENERGY STORAGE AND CRITICAL MINERALS

FUNDING DETAILS

Grid Modernization with Salt-Water Flow Batteries

With unprecedented growth of electricity demand, the need for safe, low-cost energy storage solutions is growing to support stability, reliability and affordability of electricity supply, while reducing greenhouse gas emissions in the electricity system. Aqua-Cell Energy's novel salt-water flow battery offers electricity grid operators and industrial customers a cost-effective way store energy for period of 12 hours or more. The objective of this project is to design, build and validate a fully operational and automated battery system that can communicate with an electricity microgrid. Successful project completion paves the way for field pilots with distribution system owners/operators.



RECIPIENT:
**Aqua-Cell Energy
Inc.**



PARTNERS:
**Northern Alberta
Institute of
Technology**



TOTAL BUDGET:
\$1,222,678



AI FUNDING:
\$400,000



PROJECT DATES:
**FEB 2025 –
MAY 2026**



PROJECT TRL:
**Start: 6
End: 7**



APPLICATION

Potential applications in electricity systems include peak shaving, infrastructure investment deferral, management of intermittent wind and solar generation, backup supply during short and long duration outages and, where permitted, energy arbitrage and provision of ancillary services. Potential customers include distribution system owners/operators, utility scale solar and wind generators, industries and data centers with high electricity demand, and off-grid or end-of-the-line rural and Indigenous communities and industrial facilities.



ALBERTA INNOVATES

CLEAN ENERGY

CLEAN TECHNOLOGY

ENERGY STORAGE AND CRITICAL MINERALS

PROJECT GOALS

- Design and assemble containerized battery pilot, complete with sensors and controls, to test on the Northern Alberta Institute of Technology (NAIT) Centre for Grid Innovation 50 kW micro-grid.
- NAIT's Centre for Sensors and Systems Integration (CSSI) will build the control system and interface in a parallel, out of scope project.
- Complete necessary certifications and stamped engineering drawings in preparation for next phase of development.
- Complete a battery system Unit ready for integration into a shipping container to be deployed in Alberta for the first field pilots

BENEFITS TO ALBERTA

- Help ensure affordable, reliable and resilient electricity supply and offset intermittency of low-emitting solar and wind electricity generation.
- Enhance capacity to address lengthening periods of peak energy demand.
- Provide backup electricity supply for hours or days during prolonged power outages.
- Economic diversification and job creation in Alberta's clean technology sector, from mineral extraction to battery system manufacturing, sales, installation and servicing.
- Potential economic benefits from sales and installations throughout Canada and internationally.



**3 Students
Trained**



5 Project Jobs



**101-1000
Future Jobs**



**1 New
Product/Service**



**100,000 – 1 MM t/yr
Future GHGs**

CURRENT STATUS

MAY 2025

The project has commenced. Design of key auxiliary components, materials procurement, draft FEED report and engineering drawings, and pre-seed fundraising are in progress.