ALBERTA INNOVATES

CLEAN RESOURCES

CLEAN TECHNOLOGY

GRID MODERNIZATION

EQUS Rural Alberta Smart Grid

Rural areas have not been ideal for smart grid applications due to traditional designs requiring high cost infrastructure, and network operability and communication challenges. As a result, opportunities for microgeneration, renewable energy and electric vehicles are limited in rural areas.

The Rural Alberta Smart Grid project will develop Canada's first member-owned rural smart grid. Advanced metering infrastructure (AMI) will be deployed to improve electricity outage management and response times. AMI will also provide the foundation for value-added functionalities to increase the penetration of renewable energy, microgeneration, energy storage and electric vehicles. These functionalities and benefits will be demonstrated through the project's technology deployment phase in EQUS' office building in Medicine Hat.

This project will deploy and demonstrate how smart assets and digital solutions can improve utility business processes.

FUNDING DETAILS

RECIPIENT:
EQUS REA Ltd.

PARTNERS:
Natural Resources Canada
Rewatt Power

TOTAL BUDGET:
$9,045,453

AI FUNDING:
$500,000

PROJECT DATES:
SEP 2018 – JUN 2022

PROJECT TRL:
Start: 7
End: 8

APPLICATION

Advanced Metering Infrastructure (AMI) is the foundation that is needed to install other smart grid technologies. The AMI system will result in new electricity meters for all EQUS members and communication equipment throughout EQUS' service area. The AMI system provides efficiencies in operations by supporting automation and monitoring equipment and gathers and communicates data that is valuable in understanding the health of the electricity distribution system. With this data EQUS is better able to prioritize system improvement projects with more certainty.

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PROJECT GOALS

- To deploy a new configuration of smart grid equipment to address traditional barriers and enable implementation in rural electricity areas:
  - Network reliability challenges: Network and communication coverage is a major challenge in rural deployments.
  - High capital costs: Traditional AMI requires expensive routers, lead acid batteries and a large fleet of collectors.
  - Control center data integration: Several hardware and software components must be seamlessly integrated.
  - Standardization of systems: Ease of interoperability is required between each component of a networked system, requiring central meter data management and automated outage management.
- To reduce GHG emissions associated with power delivery and use in rural areas.

BENEFITS TO ALBERTA

- Provide insights to EQUS and other Alberta electric distribution companies on how a smart grid system will perform in an Alberta rural setting.
- Improve system reliability and performance for EQUS' members by:
  - Increasing visibility into how the distribution system is operating, and
  - Use real time data to identify distribution system issues and prioritize system improvement projects.
- Share learnings on installing and integrating solar PV, battery storage and EV charging stations into a commercial facility including:
  - Monitoring the operating characteristics of each component individually,
  - Operation of an integrated system, and
  - Data to support cost-effective solutions based on electrical loads and geographic location.

3-5 Project Jobs

2 Future Jobs

64 kT/yr Project GHGs Reduced

Enabler of Future GHGs Reduced

CURRENT STATUS

JUL 2020

EQUS has deployed all AMI equipment in the Central Area with the majority of the network performing as designed. The remaining 2 EQUS service areas have AMI network equipment installed with meter installations expected to be completed by Dec 2020.

The technology demonstration in Medicine Hat has begun and is expected to be completed in Q4 2020 with monitoring throughout 2021.