The Wind R&D Park, commissioned in April 2013, is projected to produce over 3.5% of Maritime Electric Company Limited energy for 2014. Along with five DeWind D9.2 wind turbines with a generating capacity of 10 MW, the R&D Park also incorporates a Battery Energy Storage System (BESS) from S&C Electric Canada Ltd. (S&C) and General Electric (GE), which was commissioned in March 2014. The BESS is currently being used to store night-time wind energy, which is used during PEI’s evening peak load. The Wind R&D Park is demonstrating how wind energy’s variability can be mitigated and that the Wind R&D Park can be relied upon to provide power when it is most needed. This grid integration project provides a storage facility to mitigate energy variability and enhance the power system by validating grid integration models.

The BESS is composed of two primary components, namely, a Power Conversion System (PCS), supplied by S&C via its field-proven PureWave® Storage Management System (SMS), and the Durathon DC2MWh Battery System supplied by GE. The GE Durathon DC Battery System is based on GE’s sodium nickel chloride battery modules and includes GE’s Battery Management System and integrated outdoor enclosure with all required climate controls for temperatures ranging from -40 to +50 °C. This represents the first such project for GE Energy Storage in Canada. The PureWave SMS allows the energy generated by the wind turbines to charge the batteries and also allows the energy from the BESS to be released when it is needed to the utility, Maritime Electric Company Limited, for sale to retail customers.

The Institute’s new asset base will allow the Institute to expand its research mandate; support manufacturers, government, and academia; and offer system operators and utilities a unique test bench for wind and storage systems. The Institute has expanded its research into:

- optimization of wind forecasting using real-time data
- grid integration
- storage facilities to mitigate energy intermittency
- storage performance regarding reliability and economics
This project was made possible when the Natural Resources Canada’s demonstration project, the BESS will be operated in a number of ways including:

- demand reduction
- power smoothing
- voltage control
- power smoothing
- time shift mode

The Institute’s Wind R&D Park and Storage System

The Institute will examine how energy storage can improve renewable energy penetration and stabilize the grid, particularly examining the effectiveness of storage on a weak transmission network. As a demonstration project, the BESS will be operated in a number of ways including:

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TRAINING, OUTREACH AND PUBLIC EDUCATION

Public Outreach Activities

The Institute hosts numerous groups each year at their site in North Cape. These include political leaders, professionals, academics, and clients from all over the world. In addition, the Institute has participated in industry conferences and other wind-related seminars. These activities have been an important part in the process of educating key decision makers about the technical and economic capabilities of wind energy; as well as allowing the Institute’s staff to remain current on the status of the industry.

Visiting Academics and Students

The Institute provides the opportunity for scholars and summer and co-op students in the field of wind energy to work at the Institute.

TECHNICAL CONSULTATION AND ASSISTANCE

Wind Resource Assessment (WRA) in the North

The Institute continues to perform WRAs in Northern Canada. As these communities rely on expensive imported fossil fuel supplies to meet electricity needs, it is expected that these WRAs may be the first step to a decreased dependency on fossil fuels. The Institute’s recent work includes:

1. Qulliq Energy Corporation - Cape Dorset
2. Cambridge Bay

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