

# Wind Energy Institute of Canada

Leading the development of wind energy across Canada through research, testing, innovation, and collaboration.

The Wind Energy Institute of Canada (WEICan), located in North Cape, Prince Edward Island, has been leading the development of wind energy across Canada through technical testing and consultation; research, development and demonstration; and outreach since its formation in 1981. As a national research facility and independent wind farm and battery energy storage system operator, with strong industry ties, WEICan is well-positioned to lead research in the advancement of wind energy.

WEICan received funding through NRCan's Clean Energy Fund and a loan from the province of PEI to own and operate a Wind R&D Park that features five 2 MW wind turbines and a storage system with a 1 MW/2 MWh capacity. WEICan views this infrastructure as a laboratory that is available for research and is open to collaboration with interested parties.

## WIND R&D PARK

### WIND TURBINE PERFORMANCE

Since commissioning in 2013, WEICan's 10 MW Wind R&D Park turbines have generated over 180.2 GWh of energy.

#### Attributes of the Wind R&D Park's DeWind D9.2 turbines :

- Reliable operation in harsh coastal environment and cold weather
- Direct medium voltage tie-in of the D9.2's 13.8 kV synchronous generator
- Voltage control capabilities providing stability to utility grid presents a unique opportunity to view impact on grid
- Integration of battery grid stability support in the future

#### 2016 Performance Statistics (January 2016-December 2016):

- 41.9 GWh energy produced
- 91% Availability
- 48% Capacity Factor

#### Wind R&D Park Wind Turbine Specifications:

Installed Turbine Capacity	10 MW
Number of Wind Turbines	5
Model	DeWind D9.2
Frequency	60 Hz
Cut In Wind Speed	4 m/s
Cut Out Wind Speed	25 m/s

### RESEARCH PROJECTS HIGHLIGHTS

#### Wind energy grid integration:

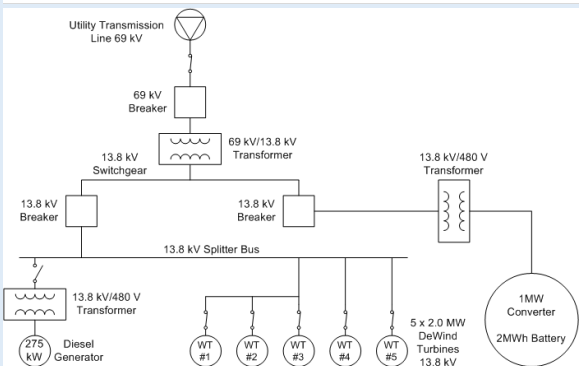
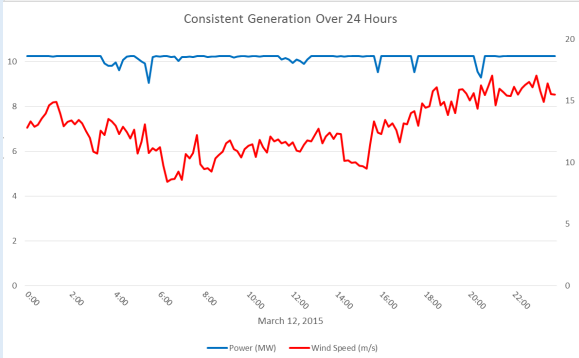
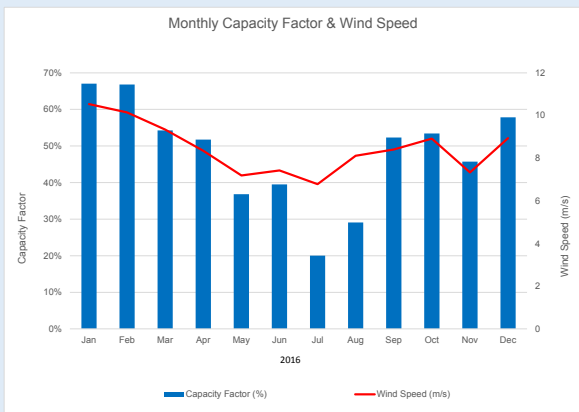
Objective is to understand how wind turbine operation and energy storage can offer benefits in wind energy integration into the grid. Scenarios tested include:

- Demand/Energy Avoidance
- Automatic Generation Control
- Diesel Displacement
- Time Shifting

#### Service Life Estimation:

WEICan is interested in how factors such as complex terrain, high capacity factors, icing and severe weather, cold climate, and delayed maintenance cycles will impact turbine service life and/or performance degradation.

Data is collected from SCADA, log books, condition monitoring equipment, and meteorological masts to estimate wind turbine service life.



## North Cape Wind R&D Park



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