

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 operator, with strong industry ties, WEICan is well-positioned to lead research in the advancement of wind energy.

WEICan owns and operates a Wind R&D Park that features five 2 MW wind turbines and well-instrumented 80 meter meteorological mast. In fall 2020, WEICan expects to have a >100 kW photovoltaic array and a 111.5 kW/223 kWh battery energy storage system. 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 generated over 245 GWh of energy as of December 31, 2019.

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

- Reliable operation in harsh coastal environment and cold weather
- Direct 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

2019 Performance Statistics (January 2019-December 2019):

- 43 GWh energy produced
- 95% Availability
- 49% 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 PROJECT HIGHLIGHTS

Grid integration:

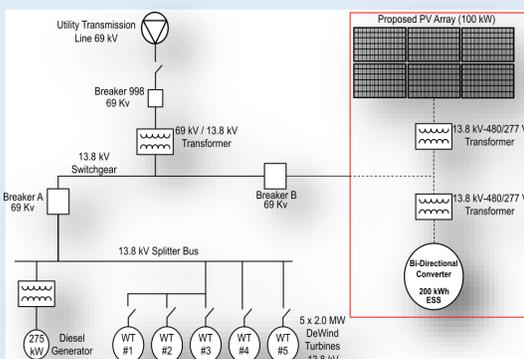
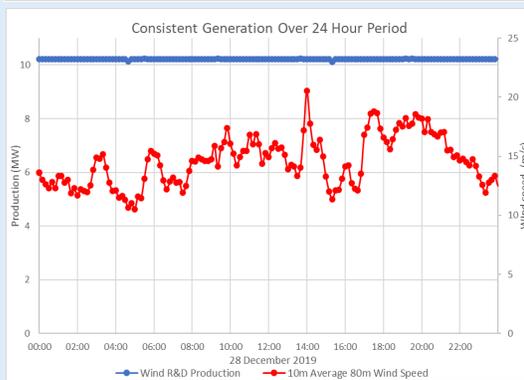
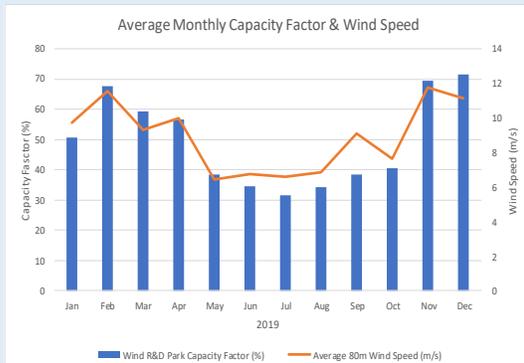
Increasing the amount of renewable generators such as wind turbines and photovoltaics on the electrical grid can bring challenges. Not only are generation outputs uncertain because wind and solar are variable, but they are replacing conventional generators, which have traditionally provided ancillary services. The ability of these technologies, along with batteries, to provide ancillary services is increasingly critical to maintain grid stability. WEICan is interested in improving grid stability as the penetration of renewable energy increases.

Asset Management/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 impact turbine service life and/or performance degradation. Data, including SCADA, meteorology, maintenance logs and reports, and condition monitoring systems are being used to enhance understanding of turbine component aging and improve wind farm operations and maintenance.

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North Cape Wind R&D Park

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