

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, the Institute 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 that was commissioned in 2013, a battery energy storage system with a 111.5 kW/223 kWh capacity, and solar PV array with a 109 kW capacity. The Institute 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

WEICan's Wind R&D Park produces ~40 GWh each year, with higher production in the winter than the summer mainly due to higher wind speeds..

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 13.8kV synchronous generator
- Voltage control capabilities providing stability to utility grid presents a unique opportunity to view impact on grid

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
Operating Temperature Range	-30 to +40 °C

RESEARCH PROJECTS HIGHLIGHTS

Grid integration of renewable energy:

As the amount of non-synchronous renewable generators such as wind and photovoltaic increases on the electric grid, they can present challenges to its operation:

- Generation sources such as wind and solar are variable by nature, making their generation uncertain
- Wind and solar generators replace conventional power generators which traditionally provide ancillary services

WEICan is researching ways to overcome the perceived shortcomings of renewable energy through carrying out demonstrations in collaboration with utilities and system operators.

Service Life Estimation:

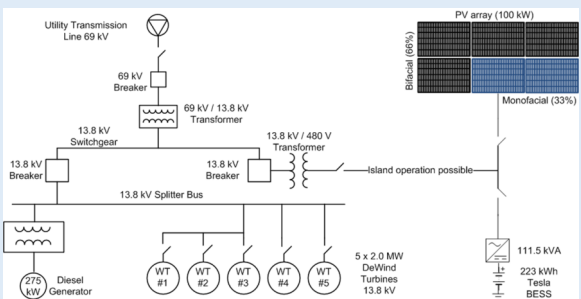
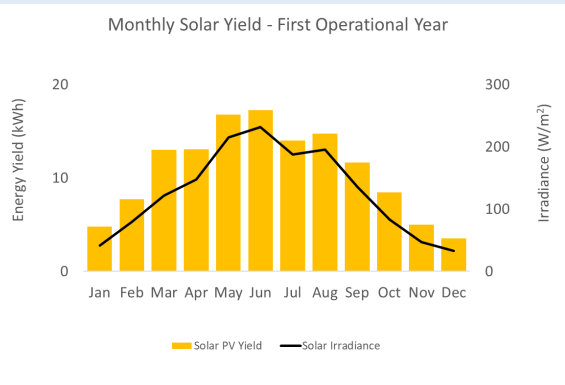
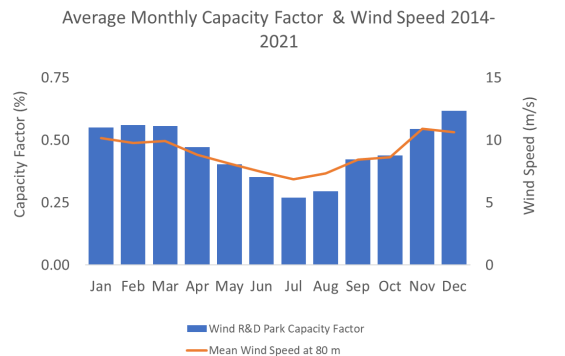
As wind farms age, owners question whether to invest to maintain assets, expand operations, or discontinue investments. Bankability, reliability, and long-term performance are critical issues for wind turbine investors, owners, operators, and manufacturers.

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 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

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North Cape Wind R&D Park



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