

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 owns and operates a Wind R&D Park that features five 2 MW wind turbines and an energy 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.

WEICAN CURRENT RESEARCH ACTIVITIES

Wind Energy Storage and Grid Integration

Objective is to understand the benefits that energy storage can provide in terms of wind energy integration. WEICan has undertaken the following scenarios with the battery energy storage system:

- Demand/Energy avoidance
- Diesel Displacement
- Automated Generation Control for frequency support
- Time Shifting
- Stacked Services: Time Shifting and Automated Generation Control
- Future possibilities include voltage support, stacked services and wind prediction firming

Service Life Estimation

Data Analytics for Turbine Component Service Life

Objective is to use data from wind turbine performance and condition monitoring systems to study wind turbine service life with the following goals:

- Identify trends in maintenance issues
- Assess changes in loading conditions
- Identify causes for underperformance and component wear
- Map structural aging

Impact of Wakes and Cliffs on Wind Speed and Turbulence

Objective is to understand the impact wakes and escarpments have on wind speed and turbulence and how this affects wind turbine performance and service life with the following goals:

- Spatially map wind speed and turbulence to form a database that can be used for physical and numerical simulations
- Correlate wind speed and turbulence data to turbine performance and condition monitoring data

Small Wind Turbine Performance Study

Objective is to study small wind turbine performance and determine the root cause of underperformance with the following goals:

- Determine whether small wind turbines meet performance expectations
- Determine the cause for any discrepancy between expectations and actual performance

Wind R&D Park Characteristics

Generation Capacity	10 MW
Number of Wind Turbines	5
Model	Dewind D9.2
Storage Capacity	2 MWh
Storage Rating	1 MW
Inverter Model	S&C Purewave
Battery Model	GE Durathon
Temperature Range	-30°C to +27°C



North Cape Wind R&D Park



www.WEICan.ca

Contact:

Marianne Rodgers, Ph.D.

Scientific Director

(902) 882-2746 Ext 207 Marianne.Rodgers@weican.ca