

WISE

WATERLOO INSTITUTE
FOR SUSTAINABLE ENERGY



LECTURE SERIES

FREE ADMISSION | OPEN TO THE PUBLIC

BUILDINGS | CARBON CAPTURE AND STORAGE | FUEL CELLS | NUCLEAR | POLICY | PLANNING
RENEWABLES | SMART GRID | STORAGE | SUSTAINABLE MOBILITY | SUSTAINABILITY ANALYSES

PRESENTED BY THE WATERLOO INSTITUTE
FOR SUSTAINABLE ENERGY

Tuesday December 13, 2016

10:30 – 11:30 am

CPH 4333

EXPERIMENTAL AND COMPUTATIONAL OPTIMIZATION OF A WIND TURBINE BLADE DE-ICING SYSTEM

Daniela Roeper B. A. Sc., Founder, Borealis Wind

Borealis Wind has designed a wind turbine blade de-icing retrofit (the “Borealis De-icing System”). This system is an internal hot-air heating system designed as a retrofit for wind turbine blades. The purpose of this system is to de-ice the blades of the wind turbine, once it has shut down due to ice build-up. This presentation outlines the validation tests that have been completed and their results. The tests completed include: computational fluid dynamics (“CFD”) modeling of the airflow within the blade, numerical thermodynamics modeling, numerical airflow modeling, computational modeling of the thermodynamics and airflow within the blade and physical airflow testing. The static and fatigue load testing on the mounting system as well as the installation of the first prototype into a GE 1.5sle wind turbine are currently underway, however their results up until October 16, 2016 are presented. The results show that the system is able to de-ice the wind turbine blade in under 90 minutes at -5°C and that the installation of the system requires 1 day per blade for 3 technicians. The purpose of the presentation is to show the validation tests that have been completed as well as outline the remaining tests that must be completed and where there are possibilities for research collaborations.

Borealis is currently seeking research collaborations in computational fluid dynamics, material testing and control systems.

Biography



Daniela is a mechanical engineer with a passion for the environment. She has work experience in the renewable energy industry, specifically in wind and solar. While still completing her undergraduate degree from the University of British Columbia, Daniela founded Borealis Wind, a start-up that provides an internal rotor blade heating retrofit for wind turbines, de-icing the blades therefore improving the reliability as well as energy efficiency. The system is now installed at wind farms and undergoing the first winter of pilot testing.

ALL ARE WELCOME!

VISIT
[WISE.UWATERLOO.CA/EVENTS](http://wise.uwaterloo.ca/events)
FOR MORE DETAILS

REGISTER ON EVENTBRITE