

Renewable Energy Applied Research at Lakeland College

Renewable energy (solar photovoltaic, solar thermal, wind and geothermal) is becoming an increasingly important part of our global sustainable energy generation future. Today, solar energy represents less than one percent of the Canadian energy generation portfolio, but with increasing advances in renewable energy (RE) collector technology, enhanced consumer awareness and the right incentives and policy frameworks, Canada is poised on the cusp of developing a renewable energy generation future.

To make renewable energy a viable future reality, actions need to be taken on multiple fronts. • Growing consumer awareness of the total cost of conventional energy, and the environmental, economic, and aesthetic benefits of developing renewable energy. • Increasing the number of skilled workers trained in the development, design, installation and maintenance of RE energy systems to meet future growth in the industry. • Improving technology to reduce cost and create space efficient methods to harvest renewable energy. • Government incentives to develop and support new and emerging technologies.

Over the past five years, Lakeland College has been building applied research momentum in renewable energy, conservation, reclamation, and agriculture. Lakeland's 'Renewable Energy Cabin', a new off-grid building at the Vermilion campus, is a demonstration facility for various renewable energy technologies. The College actively promotes RE technology adoption in the community through demonstration, communications, workshops, and other training initiatives. The College is in the second year of delivering the 'Renewable Energy and Conservation' program that aims to train the next generation of leaders in renewable energy and energy conservation. Our 'geo energy exchange – installation' course is approved by the Canadian GeoExchange Coalition as a pre-certification course. Lakeland plans to develop our solar courses to align with Canadian Solar Industry Association and North American Board of Certified Energy Practitioners standards.



There are many research groups across Canada tackling various elements of the RE technology development chain. Lakeland's applied research efforts focus on the integration and adaptation of various technologies to develop a hybrid systems approach at the homeowner level to visualize and maximize energy generation efficiency. In our recent application to the [NSERC College and Community Innovation Program](#), four out of four reviewers recommended our research for funding, however, the proposal was declined as the program requires more direct industry investment. The applied research proposal encompassed three main themes:

1. Developing multi-component monitoring and diagnostic systems that can be accessed from anywhere. Single technology installations are simple but challenges arise when multiple components (solar PV and wind power) are installed in tandem. Lakeland plans to work with renewable energy companies to develop 'smart' solutions to address the challenges of technology variances including methods to tie to smart grid dashboard solutions that visualize and quantify energy output.
2. Implementing systems to control and increase the efficiency of multi-component installations.
3. Identifying and testing technologies suitable for more efficient seasonal and low temperature maintenance geothermal storage of solar heat in the Western Canadian climate including methods to improve heat transfer between storage and site usage.



Lakeland will be resubmitting the proposal on November 23 for \$2.3 million in federal research funding over five years. The College is currently looking for industry partners to join in and support our program of research. The College hopes to raise an additional \$50,000 cash and \$120,000 in-kind per year for the project.

The Lakeland Advantage: Lakeland College faculty cover a broad range of expertise in trades, engineering, construction and instrumentation. Students come to Lakeland from BC, AB, SK and other provinces to experience our unique programs and lifestyle. Our rural community and students are a key market demographic for renewable energy technologies and have been very involved in our renewable energy outreach activities. Companies that work with Lakeland will gain access to our pan-Canadian network of renewable energy expert advisors, access technology assessment support, and leverage our solution-focused applied research approach.

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