

## UBC SUSTAINABILITY SCHOLARS PROGRAM 2019

The UBC Sustainability Initiative (USI) is pleased to offer current UBC graduate students the opportunity to work on funded sustainability internship projects. Successful candidates work under the mentorship of a partner organization, and are immersed in real world learning where they can apply their research skills and contribute to advancing organizational sustainability goals.

For more information about the Sustainability Scholars Program and to apply to work on this project, please visit the [Student Opportunities](#) page.

Please review the application guide (PDF) before applying.

Applications close **midnight Monday February 25, 2019.**

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**Title of Research Project:** [Assessment of alternative power sources for remote water infrastructure sites](#)

### **1. The purpose of the project is:**

The project will identify new alternative energy technologies and evaluate their suitability for powering remote sites.

Metro Vancouver's Water Services department manages several assets that are not connected to the BC Hydro grid, and thus require alternative sources of power. For these remote locations, Metro Vancouver has been considering either solar panels or thermoelectric generators (TEGs), which have advantages and disadvantages. Due to limited solar radiation in the winter, solar panels and associated batteries must be sized quite large. TEGs have low efficiency, but are preferred over heat engine generators for low-power remote applications because they have no moving parts, and thus require no maintenance and are reliable over a long service life. Newer emerging alternative energy options may be suitable and preferable to these existing options.

### **2. How will this project make a contribution to regional sustainability?)**

This project contributes to Metro Vancouver's Board Strategic Plan goal of ensuring the resilience of the regional drinking water system, by securing reliable alternative power sources for specific sites.

The project may also lead to a reduction in the use of fossil fuels in generators, which contributes to two goals of the Drinking Water Management Plan: ensuring the sustainable use of water resources by reducing the greenhouse gas emissions associated with operations, and managing the watersheds to provide clean, safe water by reducing the risk from chemical contamination. Reducing fossil fuel use also contributes to the Integrated Air Quality and Greenhouse Gas Management Plan goal to minimize the region's contribution to global climate change.

### **3. Outline the scope of project including how the scholar's work will be used by Metro Vancouver:**

- Complete a literature review and web search to identify emerging alternative energy technologies potentially suitable to provide electrical power in remote locations.

## UBC SUSTAINABILITY SCHOLARS PROGRAM 2019

- Evaluate the feasibility of each new technology by considering: technology development level, evaluation of scientific basis, independent third-party assessments, measurable benefits compared to status quo, market position relative to competing technologies, capital and operating costs, etc. Metro Vancouver will provide a sample template and further guidance for the feasibility evaluation.
- Compare the suitability and performance of the new technologies to solar panels and TEGs, using an evaluation matrix. Criteria and weighting for the evaluation matrix will be developed in coordination with Metro Vancouver staff.
- Recommend one or more technologies for pilot testing and outline a work plan for the pilot(s).

Metro Vancouver may decide to conduct the proposed pilot test(s) for the recommended technologies in a future year.

#### 4. Project Deliverables:

- Interim report summarizing the literature review and feasibility evaluations.
- Final report that builds on the interim report and summarizes the findings of all the tasks, for Metro Vancouver's internal use.
- Create a PowerPoint presentation summarizing the findings and deliver presentation to Metro Vancouver staff (if time allows).
- Executive Summary for the UBC Sustainability Scholars online project library.

#### 5. Identify the required/preferred skill set and knowledge base for the ideal Scholar.

##### Required skills:

- Excellent research and writing skills
- Strong analytical skills
- Ability to work independently
- Demonstrated time management skills
- Deadline oriented
- Demonstrated experience in energy technologies or renewable energy
- Familiar with preparing feasibility studies
- Comfortable presenting to small technical audiences
- Project management skills
- Educational background in Mechanical Engineering, Clean Energy Engineering, or Electrical Engineering

#### 6. Should the potential Scholar submit a writing sample?

- Yes
- No

#### 7. Identify specific requirements required for completing this project (if any)

- Preferably able to travel to Metro Vancouver's head office in Burnaby for two meetings over the course of the project. Virtual meetings may be arranged instead.
- Able to participate in site visit(s) within Metro Vancouver or in the watershed(s), as needed.
- Access to computer.

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Apply here:

<https://sustain.ubc.ca/student-opportunities>

To learn more about the program here:

<https://sustain.ubc.ca/ubc-sustainability-scholars-program>

Read the application guidelines to confirm your eligibility to participate in the program here:

<https://sustain.ubc.ca/student-opportunities>

Contact Karen Taylor at [sustainability.scholars@ubc.ca](mailto:sustainability.scholars@ubc.ca) if you have questions.