

SUSTAINABILITY SCHOLARS PROGRAM

Summer 2020

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 sustainability across the region.

- Visit the [Sustainability Scholars Program website](#) to learn [how the program works](#) and to [apply](#).
- Be sure to review the [application guide](#) to confirm your eligibility before applying.
- **Applications close at midnight on Sunday February 2, 2020.**

Research project title: Scan of the international status of engine electrification & assessment of opportunities for key sectors in the Metro Vancouver Region

How will this project make a contribution to regional sustainability?

Metro Vancouver's *Board Strategic Plan* provides direction to "develop and advocate for actions fundamental to meeting regional greenhouse gas emission targets and ensuring our region is resilient to the impacts of climate change." This includes "actions that will facilitate the transition to clean, renewable sources of fuel in transportation and energy provision." The Board Strategic Plan also provides direction to "continue to identify air contaminants in the region, identify priorities and pursue effective actions to reduce pollutants".

In addition, Strategy 1.1 of the *Integrated Air Quality and Greenhouse Gas Management Plan* gives direction to "Reduce emissions of and public exposure to diesel particulate matter".

The proposed research project will help staff understand the current state of electric engine technologies for various sectors and how these might be applied to key sectors in the region to reduce emissions.

This project is expected to inform the implementation of several *Climate 2050 Roadmaps*, including Transportation and Industry, as well as the non-road diesel engine emission (NRDEE) bylaw amendment process expected to take place in 2020.

Project description

The proposed project will help staff understand the current state of electric engine technologies worldwide and how these might be applied in the region to reduce emissions from a range of specific sectors.

Outline the scope of project, including how Metro Vancouver will use the Scholar's work:

This project will help Metro Vancouver incorporate measures to promote engine electrification where appropriate in support of *Climate 2050*, the *Clean Air Plan*, and *MVRD Non-Road Diesel Engine Emission Regulation Bylaw No. 1161, 2012*.

Climate 2050 and the *Clean Air Plan* will be the key climate change and air quality planning documents for Metro Vancouver to support a transition to a carbon neutral and resilient region, while continuing to improve air quality to protect public health and the environment.

The *Clean Air Plan* is the near-term action plan that will set Metro Vancouver's direction for air quality and greenhouse gas management for the next ten years. The Plan will outline actions to reduce emissions of air contaminants, including greenhouse gases, from all regional sources.

Climate 2050 is an overarching long-term strategy that will guide our region's policies and collective actions to transition to a carbon neutral and resilient region over the next 30 years. Metro Vancouver is implementing *Climate 2050* through ten issue area *Roadmaps*, which will describe how the region can reduce greenhouse gas emissions and adapt to climate change impacts. The proposed project is expected to support the implementation of the Transportation and Industry *Roadmaps*.

MVRD Non-Road Diesel Engine Emission Regulation Bylaw No. 1161, 2012 is a regional bylaw adopted in 2012 under Metro Vancouver's delegated authority to manage air quality in the region. This bylaw regulates the discharge of harmful fine particulate matter and other air contaminants from non-road diesel engines, particularly older, higher-polluting engines. A potential expansion of this bylaw is anticipated to be consulted upon in early 2020 and amendments to the bylaw would be proposed for MVRD Board adoption subsequently.

Phase 1: Investigation into the International Status of Engine Electrification

In the first phase of the project, the Scholar will research the technologies and the status of electrification of engines in a minimum of five transportation and non-road applications within Canada and globally. These applications may include, but are not limited to: heavy-duty vehicles, medium-duty vehicles, ferries, tugboats, and non-road equipment (cranes, excavators and other construction equipment, generators, forklifts, etc.). For each application, the Scholar will identify the location-specific factors for one to three locations that have supported the implementation of electric engines.

Phase 2: Assessment of Opportunities for Non-Road Electric Engines and an Emerging Priority Area in the Metro Vancouver Region

In the second phase of the project, the Scholar will drill down into the electrification of non-road engines, and if time allows, the Scholar may also complete further research about engine electrification in another emerging priority area identified in the forthcoming *Climate 2050 Roadmaps* or *Clean Air Plan*.

The Scholar will investigate the following aspects for each application of interest:

- Existing diesel engine use in the region
- Regional opportunities to implement electric engines
- Availability of suitable charging infrastructure
- Feasibility of using solar photo-voltaic charging for electric engines in the region

Further scoping details for this work will be provided based on the outcomes of the *Climate 2050 Transportation and Industry Roadmap* development and the consultation on the expansion of the Non-Road Diesel Engine Emission Bylaw.

The Scholar will rely primarily on internet research, supplemented by information provided by Metro Vancouver and primary research/interviews conducted by phone and email.

The Scholar will also identify potential next steps to build on the results of this project.

Project Deliverables:

The main project deliverable is a final report containing an executive summary and details of the research from Phases 1 and 2. The major task for this project is assessing regional opportunities for the application of electric engines to the non-road engine sector and another emerging priority sectors. The supporting analysis for identifying these opportunities should be included in the final report.

The report should include details of the methods used in collecting information and analysing the data, as well as a list of references. It is expected that the Scholar will provide a draft report before the end of the project and prior to completion of the final report, for review and feedback by Metro Vancouver.

The Scholar will also deliver a presentation of project findings to Metro Vancouver staff.

List of deliverables:

- Draft report
- Final report
- Presentation to Metro Vancouver staff
- A final report [or Executive Summary] for the UBC Sustainability Scholars online project library.

Time Commitment

- This project will take **250** hours to complete.
- This project must be completed between May 4 and August 14, 2020.
- The scholar is to complete approximately 17 hours per week.
- Research and report writing can be completed by the scholar at their convenience.
- The scholar must be available to meet over the phone or in person with the project team on a weekly basis for the first few weeks of the project, and then on a bi-weekly basis for the remainder of the project.

Required/preferred Skills and Background

- Excellent research and writing skills
- Strong analytical skills
- Deadline oriented
- Project management and organizational skills
- Demonstrated experience in conducting interviews
- Familiarity with benchmarking methods and tools
- Comfortable interacting with strangers to conduct public/in person surveys
- Communications skills
- Familiar with (or interested in) the transportation sector/electric vehicles or familiar with related technologies an asset
- Preference for students with strong research and writing skills, along with strong communication and interpersonal skills.



☒ Experience with conducting interviews for surveys and analysing, and collating the results. Experience with environmental regulatory and policy analysis is highly desirable.

The Scholar must have access to their own laptop and Microsoft Word software.

Applications close **midnight Sunday February 2, 2020.**

Apply here: <http://sustain.ubc.ca/scholarsapply>

Contact Karen Taylor at sustainability.scholars@ubc.ca if you have questions

Useful Resources

Below are some links to useful resources to help you with your resume and cover letter (there are many more online). Some of these resources also provide information on preparing for your interview.

<https://students.ubc.ca/career/career-resources/resumes-cover-letters-curricula-vitae>

<https://www.grad.ubc.ca/current-students/graduate-pathways-success>

<https://www.grad.ubc.ca/cover-letter-cv-resume-templates-ubc-career-services>

The Centre for Student Involvement & Careers will host a resume & cover letter webinar tailored for graduate students on Tuesday, January 21, 2020 from 12:00-1:30. Registration will open approximately two weeks before the webinar, and can be accessed at Careers Online.

