

Summer 2023 Sustainability Scholars Program Internship Opportunity

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 on the Apply page to confirm your eligibility before applying.

Applications close at midnight on Sunday January 29, 2023.

Project title: Research to understand the success of building retrofit programs in BC

Project Background & Overview:

Communities, Provinces, and countries around the world are striving to meet deep GHG emission reductions. To meet IPCC 1.5°C targets emissions need to be reduced by about 50% below 2010 levels by 2030, and 100% by 2050.

There are credible pathways to meeting these emission reduction targets in many sectors, but existing buildings are an extremely challenging area. Most of the buildings that exist in 2030 and 2050 exist today, and they will need to be retrofitted to help meet these goals. Retrofitting half of low-density residential buildings to be GHG neutral by 2030 and all of them by 2050 is a momentous task. In practice, this means in any given community achieving retrofit rates of about 4-7% per year where each of these buildings becomes zero or very low GHG.

Many building energy retrofit programs have been in place for many years, but generally quantitative results have not been collected or made widely known, and certainly not results for GHG emission reductions. Where quantitative results have been made known or collected, and estimates for GHG emission reductions collected, the Community Energy Association (CEA) is not certain that any retrofit programs are coming close to the reductions required, and has identified many retrofit programs that are falling very short. E.g., some older retrofit programs CEA has previously studied that have been in place for years, have achieved no detectable reduction in GHG emissions. Although many studies of retrofit programs have been conducted (e.g., former UBC Sustainability Scholar project from 2019 [Local Government Policy and Opportunity Analysis for Accelerating Residential Retrofits](#)), they can lack details of quantification particularly GHG emission reductions.

With the increased interest in climate action in BC, Canada, and around the world, an ever-increasing number of retrofit programs are being implemented and they have increasing levels of ambition. This includes a large number of new programs that are focussed on air source heat pumps in BC and other parts of Canada, and the preliminary results from these programs will be of particular interest. Other parts of the world are also showing increasing interest in such programs.

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Project description

This project will study building energy retrofit programs that have been in place and see what results have actually been achieved – any quantitative data will be collected, including where possible GHG emission reductions. Programs that are achieving the highest rates of success in different contexts (e.g., communities with or without access to natural gas) will be identified, along with their success factors.

CEA wants to know what the current upper limit is for annual GHG emission reductions from building retrofit programs – in particular whether 50% reductions by 2030 is remotely possible – and what the success factors for these retrofit programs have been. This will help CEA to design the best possible building retrofit programs, and also to more accurately model / predict GHG emission reductions for communities.

The Scholar will conduct research on the available literature, and conduct interviews with people in the retrofit programs and related activities / organisations. BC Hydro will assist the Scholar by providing information, and doing email introductions for the Scholar to set up interviews.

Project scope

The Scholar will focus first on programs in BC, including the new heat pump programs – and particularly on programs that have received funding from or otherwise collaborated with BC Hydro. Then, if there is time, on other programs in Canada, (e.g., Ottawa, Durham Region, and heat pump programs in Atlantic Canada).

The Scholar will conduct desk-based research looking at published and previously unpublished data, and will conduct phone interviews with people leading programs. The Scholar will need to create a list of interview questions with the support of CEA. The programs will provide information and data. CEA would like a minimum of 5 programs to be analysed, but with no upper limit (depends on the Scholar's time / capacity).

Note: people leading retrofit programs can be extremely busy. To assist with data collection, BC Hydro has stated that they will assist the Scholar by providing information available to them, and doing email introductions with contacts at the programs they have funded / supported for the Scholar to set up interviews.

Questions that the Scholar should determine as much as possible through research prior to conducting the interviews (some outstanding questions may need to be asked in the interviews) are around context. Programs will be heavily affected by their context. Given that, what is the context for these retrofit programs? For example,"

- Does the program focus on buildings without natural gas, or does the community have no access to natural gas
- Cost of energy locally
- Target market, including estimated size
- Type of community (e.g., small & rural, bedroom, large urban)

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Questions that the Scholar should look at in data and ask in interviews with the programs:

- What metrics are the programs collecting, in order for them to judge their own success?
- What are the quantitative results being achieved for each program? This may include any of the following, for both absolute numbers and per capita:
 - Number of enquiries
 - Number of energy assessments conducted (if applicable)
 - Number of buildings being retrofit each year, and numbers for each type of retrofit (air tightness, insulation, heat pumps, etc.)
 - Number of buildings being retrofit each year to zero or close to zero GHGs
 - Energy consumption reductions (this may have to be calculated / estimated – CEA could help)
 - GHG emission reductions (this may have to be calculated / estimated – CEA could help)
- Finally, what challenges have been identified by the programs themselves, i.e., how do they think they could improve their retrofit rates?

Based on the research, the Scholar will summarise the information above, create case studies of each program they have investigated, and attempt to answer the following:

- Foundational questions regarding quantitative metrics:
 - What metrics have the programs been collecting?
 - What is the margin for error believed to be on these? I.e., how reliable are they? (E.g., no. of energy assessments should be reliable, estimated GHG savings may be unreliable)
 - What metrics does the Scholar recommend should be used to measure the success of programs?
 - If different programs use different methodologies for any metrics, such as energy reductions or GHG savings, then does the Scholar have any recommendations for making these consistent, or for best practices?
- How do the programs compare, and why? What appear to be the best retrofit programs in the marketplace, the ones achieving the best results?
- What are the success factors for retrofit programs, and can we identify which of these are linked to the best quantitative results showing up in the metrics?
 - Grants / incentives available to encourage retrofits
 - Financing mechanisms, such as low-cost loans (3rd party financial institution, PACE, on-bill financing), and interest rate of these loans
 - Energy assessments available or required, and are these subsidised
 - Concierge service / hand-holding provided or not
 - If the programs collaborate / connect / manage / or hire trades and contractors
 - Types of marketing conducted
 - Context such as availability of contractors, community has no natural gas or focussing on homes that are not using natural gas, etc.

Deliverables

- A final report containing a summary of the work completed, including answers to the key questions listed above (in particular quantitative results from the best examples available and what are believed to be the success factors for these)
- A final report for the online public-facing [Scholars Project Library](#).

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Time Commitment

- This project will take 250 hours to complete
- This project must be completed between May 1 to August 15, 2023
- The Scholar is to complete hours between 9 am and 5 pm, Monday to Friday, approximately 17 to 20 hours per week.

Required/preferred Skills and Background

- Excellent research and writing skills
- Demonstrated interest in sustainability
- Strong analytical skills
- Ability to work independently
- Deadline oriented
- Project management and organizational skills
- Ability to conduct energy saving or GHG reduction calculations an asset.

Applications close **midnight Sunday January 29, 2023**

Apply here: [Click here to apply](#)

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

Useful Resources

We are holding a special **resume preparation workshop for prospective Scholars** on January 23, 2023. [Click here for details and to register.](#)

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>