



Campus Sustainability Fund Final Report

1.0 - Project Report

1.1 - Project Title:

Renewable energy options for UVic high temperature district energy system

1.2 - Report Prepared by:

Please indicate which leader is the main contact person

Name: Daniel Clancy, Rojin Derekhshan, Curran Crawford

UVic affiliation: Student, Student, Faculty

[Redacted]

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1.3 - Key Accomplishments

Please describe your projects key accomplishments.

The project re-examined previous studies done for UVic on district energy system (DES) renewable energy options and process optimization, in light of new technology developments. Two options were studied in more detail; biomass and ground-source high-temp heat pumps/solar thermal. Biomass feedstock available and carbon accounting was found to be the main uncertainty in that option, along with community acceptance of local combustion and truck traffic. The heat pump/solar option could provide a significant fraction of the DES load, and would be a unique technical approach for a BC university, tied in the 'greening' campus mission with research/teaching, including potentially attracting demonstration project funding to implement the system. Both options would require further in-depth engineering to fully cost and verify system performance/optimize the system.

1.4 - Student Learning:

Please describe how the expected student learning opportunities were realized.

Students learned about the overarching principles of district energy networks as well as how renewable energy systems can be integrated into them to displace natural gas consumption and consequently reduce GHG emissions. Through investigative analysis the students learned the strengths and weaknesses of various thermal energy generation technologies and how these technologies can be integrated into thermal energy distribution networks. The project was also an excellent opportunity for real-world experience, involving design trade-offs and practical implementation issues for renewable energy



systems.

1.5 - Goal Acquisition:

Was the project goal achieved? In answering please describe the how the project effected the relevant stakeholders and where the project is currently.

The project goal was in examining the potential of various renewable energy technologies in contributing to decreasing the natural gas usage within the future UVic district energy system. The goal was achieved in that reasonable estimates were made of the ability of these renewable technologies decreasing UVic GHG emissions. As well, the technologies were assessed from a technical standpoint as to whether or not they could actually connect to the high temperature district energy system. This information is intended to allow facilities management to make an informed decision about which technologies are worthy of further pursuit in regards to detailed design work.

1.6 - Long Term Consequences:

How will this project be continued and its accomplishments carried forward?

The project report is being handed over to facilities management for consideration. There is a 5-10 yr project to supplement the current DES upgrade with non-natural gas options. Both biomass and ground-source HPs/solar are potential options, that can be looked at in more detail by facilities management.

1.7 - Lesson's learned:

What advice would you give others attempting similar projects through Sustainability Fund?

The timeline for this project was longer than anticipated. Competing student time demands were challenging; setting interim dates for the project would have helped, but in this case, the project is longer-term anyways, so the project was quite successful.

1.8 - Timeline:

Please provide the *actual* project start and end dates

Start Date: May 2016

End Date April 2017

1.9 - Feedback

Do you have any feedback for the Office of Campus Planning and Sustainability or the Sustainability Fund Application Review Committee regarding your experience with the Fund?

The fund is an excellent way to concretely involve UVic campus members in on-campus projects to improve sustainability. A small amount of funding can go a long way toward the goals of integrating the teaching/research/campus operations aspects of sustainability in a very positive way.



2.0 - Project Financials

2.1 – Budget

Please provide a completed final budget describing how the budget provide was actually spent. Please provide receipts for any expenses that have not yet been claimed through the Office of Campus Planning and Sustainability.

See detailed time sheets.

Please submit completed forms electronically to mgreeno@uvic.ca

Any questions please contact:

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