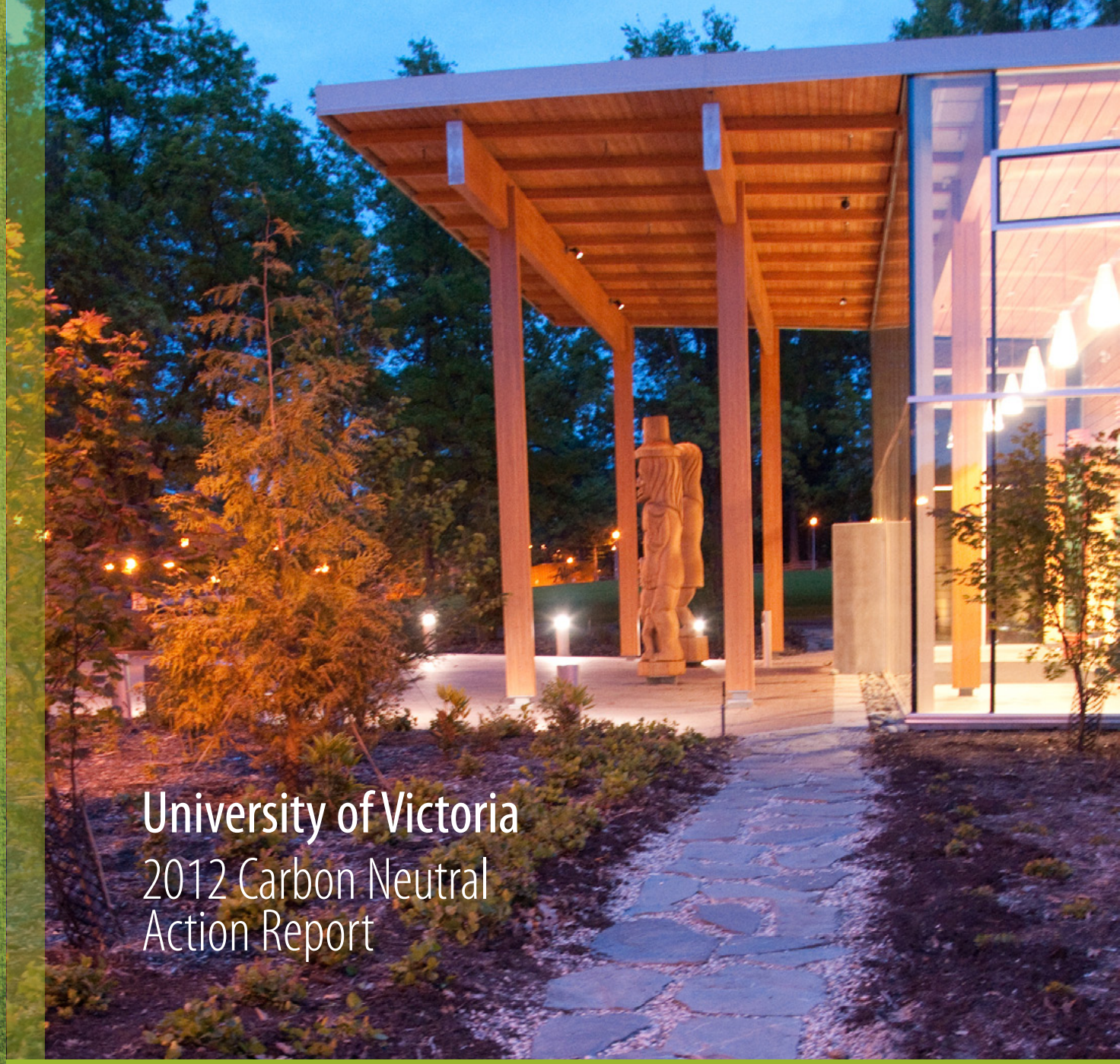

University of Victoria
2012 Carbon Neutral Action Report

University of Victoria

Sustainability in action.

Executive Summary

The University of Victoria (UVic) advances its commitment to sustainability through activities within a comprehensive institutional framework guided by a Sustainability Policy and *Sustainability Action Plan for Campus Operations: 2009-14 (the Action Plan)*. The Action Plan continued to set the direction for the wide range of carbon reduction activities and other actions related to sustainability more generally that were undertaken on campus in 2012. The Action Plan contains a detailed series of sustainability goals and actions in operational areas such as, energy conservation, greenhouse gas reduction, waste management, sustainable transportation, purchasing, food and green buildings.

Key actions from the Action Plan, such as an energy strategy, sustainability action teams, a revolving sustainabilty fund, a campus sustainability reporting system, student and staff sustainability awards and a sustainability advisory committee are well established and are helping UVic make progress on its carbon reduction and sustainability goals. A key objective is the creation of a campus that utilizes renewable energy sources for its energy needs and where facilities are developed and operated to meet current green building standards and to act as physical tools of education for both the campus and the broader community.

Through the combined efforts of facilities management, occupants and users, an eight percent reduction in the university's total greenhouse gas emissions was achieved in 2012. Both natural gas and electricity consumption levels were down compared to 2011, reflective of the success of the university's ongoing energy efficiency and conservation programs.

Two major initiatives, in particular, linked to the implementation of the campus Intergrated Energy Master Plan, have assisted in advancing the energy efficiency and low-carbon operations agenda at UVic. The university's active involvment in the BC Hydro Continuous Optimization program resulted in energy efficiencies in six of the largest campus buildings. The collective annual energy savings from these projects is estimated to be over 5 million e-kWhs, and approximately 550 tCO2e in reductions. These initiatives were complemented by a comprehensive sustainability action team behaviour change program in offices across campus where staff, faculty and students worked together to reduce energy and waste in their workplaces. Secondly, a request for proposals to complete a biomass feasibility study for the campus was initiated. The study will examine the potential to use local biomass as a renewable energy source that could supply up to 70% of the campus heating requirements.

The University of Victoria looks to continue progress on its carbon neutrality goals with the ongoing implementation of the campus Integrated Energy Master Plan, in conjunction with the enthusiasm, dedication and efforts of its students, faculty and staff.

Kristi Simpson
Associate Vice-President, Financial Planning and Operations
University of Victoria

2012 Greenhouse Gas Emissions

The total GHG emissions for the University of Victoria is 14,167.1 tCO2e for the 2012 calendar year. A breakdown of emissions is provided in Table 1 below.

Reporting Category	2011 tCO2e	2012 tCO2e	Percent Change
University Owned Buildings and Leased Space	14,987.7	13,725.0	-8%
Mobile Combustion/Fleet	271.3	306.5	13%
Paper Supplies	199.1	135.5	-32%
Total	**15,458**	**14,167**	**-8%**

Table 1. Greenhouse gas emissions for the University of Victoria.

The primary source of greenhouse gas emissions for UVic is from the natural gas heating of campus buildings. Natural gas accounts for over 85% of the emisssions, while electricity accounts for 12%. Vehicle and paper emissions make up the remainder.

Offsets Applied to Become Carbon Neutral in 2012

The total greenhouse gas emissions for the University of Victoria in the year 2012 is 14,167.1 tCO2e.

This total excludes fugitive emissions. It was estimated that stationary fugitive emissions from cooling do not comprise more than 1% of the University of Victoria's total emissions and an ongoing effort to collect or estimate emissions from this source would be disproportionately onerous. For this reason, emissions from this source have been deemed out of scope and have not been included in the University of Victoria's total greenhouse gas emissions profile.

Also, as required by section 5 of the Carbon Neutral Government Regulation, 11.3 tCO2e emissions resulting from the use of bio-fuels were reported as part of our greenhouse gas emissions profile in 2012. However, they were not offset as they are out of scope under section 4(2)(c) of the Carbon Neutral Government Regulation.

Therefore, the total University of Victoria is required to offset is 14,156 tCO2e for the 2012 calendar year.

Changes to Greenhouse Gas Emissions and Offsets Reporting From 2011

Following the public release of the University of Victoria's 2011 Carbon Neutral Action Report, it was determined that the total emission for the calendar year were over reported by 2 tCO2e for the 2011 calendar year and offsets required to become carbon neutral in 2011 were over purchased by another 80 tCO2e.

The surplus of offsets purchased in 2011 has been applied against the 2012 emissions offset purchase.

Emission Reduction Activities

UVic's commitment to sustainability and greenhouse gas reduction is comprehensive. We strive to integrate sustainability into teaching, research, campus operations and community partnerships. This approach allows the university to find synergies across disciplines and departments in order to develop strategies to address complex issues such as climate change.

Actions Taken to Reduce Greenhouse Gas Emissions in 2012

- The implementation of phase one of the BC Hydro Continuous Optimization program[1] was undertaken in six of the largest campus buildings. The projects included, but were not limited to, the installation of energy efficient lights, the integration of weather predictors into building HVAC systems, the tightening of occupancy schedules to better match occupants' actual schedules and the installation of a variable speed drive in one building's ventilation system. The result was an estimated energy savings of 3,000,000 kWh of electricity and 2,600,000 e-kWh of natural gas, which translates into almost 550 tCO2e.
- The revolving sustainability fund, which provides resources for electricity, natural gas and water use reduction projects that demonstrate cost savings to the university with a payback period of five years or less, continued to provide funding for projects that might not have otherwise been undertaken under normal budget scenarios. Three projects were implemented. First, the installation of a carbon monoxide sensing system that turns on only when needed in an underground parkade, eliminated the need to leave the system running 17 hours per day, resulting in savings of approximately 39,000 kWhs and $2,920 per year. Two additional projects, a water fixture upgrade in two campus buildings, and the replacement of old, water-based aspirators in a chemistry lab with portable electric vacuum pumps, together resulted in savings of approximately 6,603 cubic meters of water per year and $15,395 in utility costs.
- Detailed energy studies, co-funded by BC Hydro (through the Energy Study Program) and UVic, were completed on the Student Union Building and the University Club. The reports recommend various energy savings initiatives that could result in electrical and natural gas savings of at least 10%. These reports identified many different energy efficiency retrofit opportunities that will be assessed as part of future work projects.
- UVic is also in the process of implementing an Integrated Energy Master Plan, which recommends the investigation of a campus biomass energy plant. An RFP was issued in late 2012 to retain consultants to conduct a feasibility study in 2013. This is the first step towards the possible commissioning of a large scale renewable energy project that could provide up to 70% of the campus' heating requirements.
- The sustainability action team program, with funding from BC Hydro PowerSmart's Workplace Conservation Awareness program, continued with behaviour change programs with staff, students and faculty in four additional campus buildings (six buildings participated in 2011). Building occupants were provided with basic information on how to conserve energy and reduce waste in the work place, and teams competed to see which could show the most improvement over a one month period.

[1] The BC Hydro Continuous Optimization program offer incentives and supports, including funding 100% of the cost for a re-commissioning consultant to study a building and recommend energy efficiency improvements. In return, for BC Hydro's investment, customers must commit to implement, at their cost, electricity and fuel (including natural gas, steam, hot water, propane, etc...) measures that when bundled have a two-year simple payback.

Plans to Continue Reducing Greenhouse Gas Emissions 2013-2014

The University of Victoria has a strong history in sustainability and has established goals for electricity and GHG emissions reductions. UVic employs a range of methods to reach these goals, which extend from sustainable purchasing policies to continuous optimization programs for energy use.

A priority for the university in 2013-2014 will be to implement the recommendations of the Integrated Energy Master Plan. Specifically, a consulting firm will be retained throughout 2013 to conduct the biomass feasibility study. Other important aspects of the master plan being considered for implementation include:

- The installation of control systems on the existing district heating loop, which currently has minimal controls.
- The installation of a heat recovery ventilation system in the increasingly utilized UVic Enterprise Data Centre.
- An assessment of the feasibility of using solar hot water for some of our campus hot water needs, particularly in the summer months.

Other greenhouse gas reduction efforts will focus on:

- Continued implementation of a revolving sustainability fund to provide capital for innovative energy reduction projects. This includes the Enterprise Data Centre2 upgrade project, approved in, December 2012, with estimated savings of over 500 MWhs or ~$38K, or approximately 12.7 tonnes of CO2e/year.
- Behaviour change initiatives and programs that focus on the main users of the campus, such as the sustainability action team program in offices, labs and student residences.
- Implementation of phases two and three of the BC Hydro Continuous Optimization program.

Additional information on sustainability at the University of Victoria is available at **www.uvic.ca/sustainability**