



University
of Victoria

2015 Carbon Neutral Action Report



Sustainability in action.

May 31, 2016



Executive Summary

In 2015 greenhouse gas emissions for the University of Victoria decreased to 7 percent below 2014 levels. This continued reduction is a result of our many on-campus initiatives and activities, such as the BC Hydro Continuous Optimization program and the work of the University of Victoria (UVic) Facilities Management Department. The Sustainability Action Team programs also contributed to the decrease through various engagement activities with students, faculty and staff on campus.

With the 2015 calendar year greenhouse gas (GHG) emissions reduction, UVic emissions decreased to 31 percent below our 2010 baseline. The university's Sustainability Action Plan goal is to achieve a 30 percent emissions reduction by 2019 and in 2015 we have surpassed that goal. Weather was a contributing factor to this positive result. UVic remains well positioned to achieve the provincial goal of 33 percent by 2020 through its energy efficiency efforts.

UVic continues its building retrofit projects in partnerships and support with BC Hydro, Fortis BC, and the Carbon Neutral Capital Program,

and work with the campus community through behavioural change programs in offices and laboratories. Upgrades to the main UVic district energy system are planned to be completed by 2019 and are expected to contribute to significant GHG reductions on campus.

This Carbon Neutral Action Report for the period January 1st to December 31st, 2015 summarizes our emissions profile, the amount of offsets purchased to reach net zero emissions, the actions we have undertaken to reduce our greenhouse gas emissions and our plans to continue reducing emissions in 2016.



Kristi Simpson

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



2015 Greenhouse gas emissions

The total greenhouse gas emissions for the University of Victoria are **10,706 tCO₂e** for the 2015 calendar year. Emission categories are outlined in Table 1 below:

REPORTING CATEGORY	2014 tCO ₂ e	2015 tCO ₂ e	% CHANGE
University owned buildings and leased spaces: Natural Gas	10,357	9,607	-7%
University owned buildings and leased spaces: Electricity	690	614	-11%
Mobile combustion (Fleet)	322	326	1%
Paper supplies	203	160	-21%
Total	11,572	10,706	-7%

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

The primary source of greenhouse gas emissions at the University of Victoria derives from the energy systems in buildings on campus, which are powered primarily by natural gas. Specifically, in 2015, 68 percent of the natural gas related emissions were derived from the district energy system used for space and hot water heating in 33 buildings across the campus.

In 2015, the university's natural gas related emissions have reduced by 7 percent as compared to 2014 values. This reduction in natural gas emissions is due to energy retrofits on building heating systems and continued energy conservation practices. Energy conservation and retrofit work at the Bamfield Marine Sciences Centre resulted in a notable 40 percent reduction in gas use, which also contributed positively to the reductions reported. The shutdown of the McKinnon pool during building renovations as well as sections of the Ian Stewart Complex, and Petch Building during retrofits have also contributed to the reduction observed. On the other hand, UVic opened the largest single building on campus, the Centre for Athletics, Recreation and Special Abilities, in May of 2015. This new building added a significant energy footprint but did not adversely affect our overall energy reduction levels in 2015.

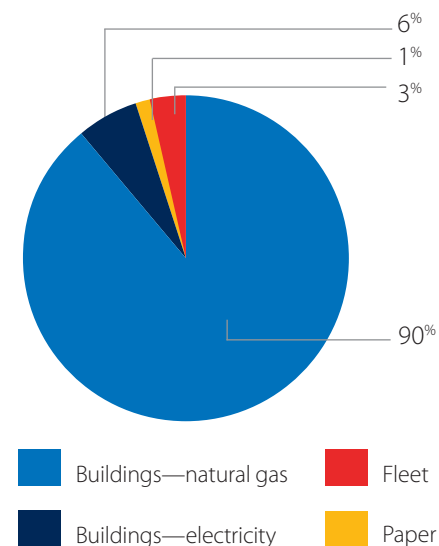


Figure 1: 2015 Greenhouse gas emissions percentage of each reporting category for the University of Victoria

Electricity based greenhouse gas emissions were down 11 percent in 2015 largely due to building energy retrofits and energy conservation practices.

Mobile combustion based greenhouse gas emissions were stable. The university did observe a small increase that was accounted for by greater fleet use by academic units on campus. The majority of the mobile emissions continue to be generated by Facilities Management fleet vehicle use.

Paper use has decreased campus wide. A 20 percent reduction in paper consumption was observed along with a 21 percent reduction in associated emissions. The greater reduction in emissions was a result of a substantial decrease in the amount of virgin paper reported, which has a higher emission factor than paper containing recycled content.

Figure 1 above shows that natural gas accounts for 90 percent of the total emissions, while electricity accounts for 6 percent. Emissions associated with fleet vehicles and paper purchases comprise the remainder.

Weather normalized data

The 2015 calendar year represents a significant milestone. Greenhouse gas emissions at the university decreased to 31 percent below 2010 levels. However, 2015 was the fourth consecutive year with warmer temperatures, resulting in less building space heating requirements.

Internal analysis indicates weather had a substantial impact on the GHG reductions observed this year. Approximately half of the reduction this year can be accounted for by reduced heating requirements. Further, when normalized for weather, UVic emissions are down 25 percent relative to 2010, which underscores the need for further work to reduce GHGs.

Changes to greenhouse gas emissions and offsets reporting from previous years

Following the public release of the 2014 Carbon Neutral Action Report, it was determined that 2014 natural gas data was incomplete for several locations, and therefore the total emissions were under reported by 9 tCO₂e.

Offsets applied to become carbon neutral in 2015

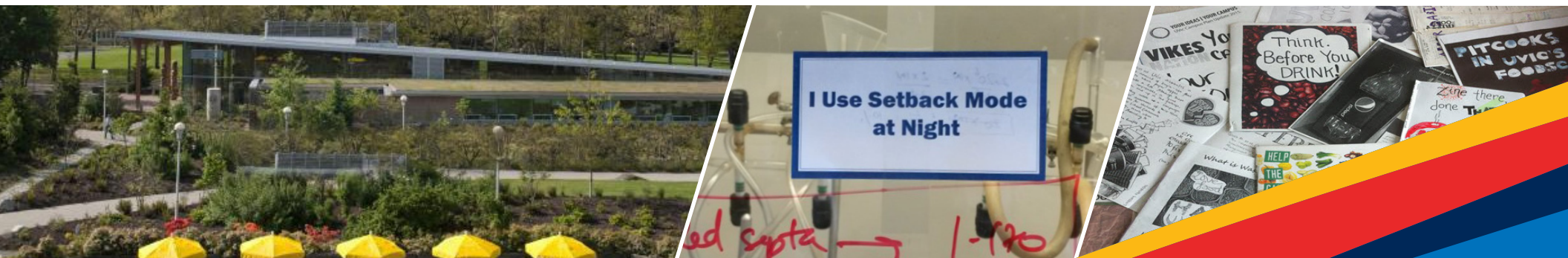
The total greenhouse gas emissions for the University of Victoria in the year 2015 are 10,706 tCO₂e which includes all properties owned by the university on and off campus, and properties leased from other entities for university business.

This total excludes fugitive emissions as it was estimated that stationary fugitive emissions from cooling do not comprise more than one percent 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.

As required by Section 5 of the Carbon Neutral Government Regulation, 12 tCO₂e emissions resulting from the use of bio-fuels¹ were reported as part of our greenhouse gas emissions profile in 2015. However, they were not offset as they are out-of-scope under Section 4(2) of the Carbon Neutral Government Regulation.

The total offset purchase includes 10,694 tCO₂e for 2015, along with adjustments from reporting for previous years. As a result, the total Greenhouse gas emissions that the University of Victoria is required to offset for 2015 is 10,703 tCO₂e.

¹Biofuels refers to B5 fuel (5 percent biodiesel, 95 percent petro diesel) used in university generators and diesel fleet vehicles.



Emission reduction activities

The University of Victoria's commitment to sustainability and greenhouse gas reductions is part of a comprehensive institutional effort and is guided by our Sustainability Action Plan: Campus Operations 2014—2019. The university strives to integrate sustainability into teaching, research, campus operations and community partnerships. This approach allows us to find synergies across disciplines and departments to assist in advancing campus sustainability and climate action throughout the institution.

Actions taken to reduce greenhouse gas emissions in 2015

The 2015 calendar year was impacted by a transition in energy management. Staff turnover within the Facilities Management resulted in a new Energy Manager and Director of Operations personnel in 2015. Key actions included:

- Planning for various large scale projects and Phase three of the Continuous Optimization (C-Op) program involved a significant concentration of work efforts in 2015.

Planning for implementation of phase three of the C-Op program, which included five high energy use buildings at UVic, occurred in late 2015. The planned retrofits included alterations to the interior lighting systems, HVAC systems, and boiler upgrades. The savings expected from this suite of projects is estimated at 1,126,000 kWhs of electricity and 1,000,000 kWhs of natural gas.

Two energy studies were commissioned in 2015 to examine energy saving opportunities in the Fine Arts and Visual Arts Buildings.

In conjunction with the UVic Campus Plan update, UVic Facilities Management conducted a Sustainable Site Requirement Study, which examined the space that would be require to install low and zero carbon energy systems and technologies. Technologies examined were:

- Solar photovoltaics,
- Biomass,
- Municipal solid waste combustion,
- Biomass combustion,
- Anaerobic digestion,
- Campus waste energy recovery, and
- Geo-exchange

The Carbon Neutral Capital Program funding was coupled with the UVic Revolving Sustainability Loan Fund to implement an integrated heat recovery system for the McKinnon Pool, which was designed in late 2015 for implementation in early 2016. This single project is expected to save over 900,000 kWhs and reduce emissions at UVic by over 200 tonnes of CO₂e/year.

In 2015 UVic initiated a multi-year planning process that will result in the upgrading of our district energy system. This project will involve the relocation of our current main boiler systems, an increase in boiler efficiency, and space allocated in the boiler facility to accommodate alternative low and zero carbon energy systems and technologies.

- The campus shutdown during the Christmas holiday period was coordinated by the Controls Group within Facilities Management. The heating and lighting schedules reduced starting December 24th and remained as such until January 3rd. As a result UVic saved over \$52,000 in operating costs and prevented over 140 tonnes of CO₂e emissions from being emitted.



- The UVic Controls group also initiated a project to decommission an underused boiler in the UVic Facilities' Shops and replace it with a more efficient system.
- UVic decommissioned an underutilized greenhouse in 2015, which was heated during the winter months.
- With funding from BC Hydro Power Smart's Workplace Conservation Awareness program, the Sustainability Action Team program continued with behavioural change activities involving staff, students and faculty in two categories: Green Offices and Green Labs.

The Green Office program run in 2015 was one of the largest to date, with more than 150 participants, most of whom committed to engaging in at least one energy saving activity.

The Green Labs program continued with guided group discussions sessions held with the chemistry lab groups that operate in the Bob Wright Centre. This program acquired commitments from the individual lab users to safely use the setback switches on fume hoods more frequently. The aim of the program was to maintain or increase the use of low energy mode of the fume hood.

Plans to continue reducing greenhouse gas emissions

The University of Victoria's priorities to further reduce greenhouse gases in 2016 will be through the following activities:

- Completing phase 3 of the BC Hydro Continuous Optimization program including:
 - Upgrades to the control systems in the University Centre and McPherson Library.
 - Lighting upgrades in the University Centre, Petch, McKinnon, and Child Care Centre buildings.
- Control upgrades in the Cunningham, McKinnon, and Petch buildings.
- Implementing the McKinnon Heat Recovery project in early 2016.
- Continuing to engage faculty, staff and students with behavioural change initiatives and energy savings programs.
- Continue the planning and design for the upgrade of the UVic district energy system.
- Implement projects through the UVic Revolving Sustainability Loan Fund

For additional information on sustainability, along with greenhouse gas reporting and energy initiatives at the University of Victoria, please see our website at uvic.ca/sustainability

