



# 2018 CARBON NEUTRAL ACTION REPORT



Sustainability in action.

May 31, 2019



## Executive summary

This Carbon Neutral Action Report is for the period of January 1st to December 31st, 2018. The report summarizes the University of Victoria's (UVic) green house gas (GHG) emissions profile, the amount of offsets purchased to reach net zero emissions, the actions undertaken to reduce our greenhouse gas emissions and the university's plans to continue reducing emissions in 2019 and beyond. As of 2018, UVic is 25 percent below the 2010 GHG emissions baseline.

In 2018 emissions totalled 11,603 tonnes of CO<sub>2</sub>e (tCO<sub>2</sub>e) representing a 9 percent decrease (1,109 tCO<sub>2</sub>e) over the prior year. This decrease is attributed to scope 1 and 2 emissions and is mainly a result of reduced natural gas consumption by UVic's district energy system. The balance is from fleet fuel consumption decreases (scope 1) and decreased electricity usage in buildings (scope 2).

Several initiatives to reduce emissions were under taken in 2018 including retrofit and optimization programs in campus buildings, numerous energy efficiency studies, and the construction of the new District Energy Plant (expected to be complete in 2019). The university saved over 100 tCO<sub>2</sub>e as a result of these initiatives and created a plan for further efficiency improvements in 2019. While UVic efforts were significant, the emission decreases observed in 2018 are largely attributable to lower building heating partly due to warmer weather and partly due to the Enbridge Pipeline rupture, which UVic responded to by lowering the temperature set point in campus buildings in the fall of 2018.

UVic continued to optimize its fleet in 2018 with the purchase of three more electric vehicles. These changes combined with a reduction in consumption from fleet and academic research vehicles helped to reduce fleet emissions by 15 percent. The use of these vehicles fluctuates with research and teaching volume and therefore is expected to change from year to year.

In 2019, the university will continue to develop and implement climate action initiatives in support of achieving the goal of a 30 percent GHG reduction below 2010 levels by 2019. The project that will have the single biggest impact in helping us meet this goal is the new District Energy Plant. This plant is being commissioned for use during the fall and winter heating season of 2019 and is expected to result in approximately 700 tCO<sub>2</sub>e emissions reduction annually, getting us close to attaining our goal.



**Kristi Simpson**

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



## 2018 Greenhouse gas emissions

The total greenhouse gas emissions for the University of Victoria are **11,603 tCO<sub>2</sub>e** for the 2018 calendar year. Emission categories are outlined in Table 1 below:

REPORTING CATEGORY	2017 tCO <sub>2</sub> e	2018 tCO <sub>2</sub> e	% CHANGE
<b>SCOPE ONE:</b> University owned buildings & leased spaces: Natural gas, diesel, & heating fuel	11,451	10,415	-9%
<b>SCOPE TWO:</b> University owned buildings & leased spaces: Electricity	729	683	-6%
<b>SCOPE ONE:</b> Mobile combustion (Fleet)	386	329	-15%
<b>SCOPE THREE:</b> Paper supplies	146	176	20%
<b>Total</b>	<b>12,712</b>	<b>11,603</b>	<b>-9%</b>

Table 1: Greenhouse gas emissions for the University of Victoria

In 2018, UVic observed a 1,109 tCO<sub>2</sub>e decrease. This decrease is attributed to scope 1 and 2 emissions. The major driver of emissions in UVic's portfolio continues to be the district energy system. The system provides space and hot water heating in 33 buildings across campus and accounts for approximately 76 percent of the decrease observed. Decreases were observed across the UVic building portfolio, however, including those on campus, external properties, and shared facilities.

In 2018, UVic neared completion of a new District Energy Plant. The plant will allow for the decommissioning of three older, less efficient, plants on campus. New energy transfer stations are being installed throughout the district energy system and high temperature loads will be removed from the system. In total, these changes will allow UVic to reduce the temperature of the district energy loop and decrease the system wide emissions by approximately 700 tCO<sub>2</sub>e annually.



The new District Energy Plant is scheduled to be operational in 2019.

The plant is expected to be commissioned in time to provide heat and hot water to UVic buildings during the 2019/2020 heating season. UVic estimates approximately 300 tCO<sub>2</sub>e reduction in emission associated with the new plant in 2019.

New District Energy Plant is estimated to reduce approximately 300 tCO<sub>2</sub>e in emission in 2019

Building heating demand accounted for 98 percent of the decrease in emissions observed. Figure 1 demonstrates that the campus experienced an 8 percent decrease in heating degree days (HDD) below 2017. Heating degree days are measured by identifying days with an average temperature below 18°C (heating days) and summing the total number of degrees below that temperature for each day (heating degree days). The HDD were slightly below the 10 year average and UVic was 25 percent below our 2010 emissions baseline. The university's goal is a 30 percent GHG reduction below 2010 levels by 2019, which the graph shows may be met. The story the graph tells, however, is one of a struggle to continue the university's downward emissions trajectory.

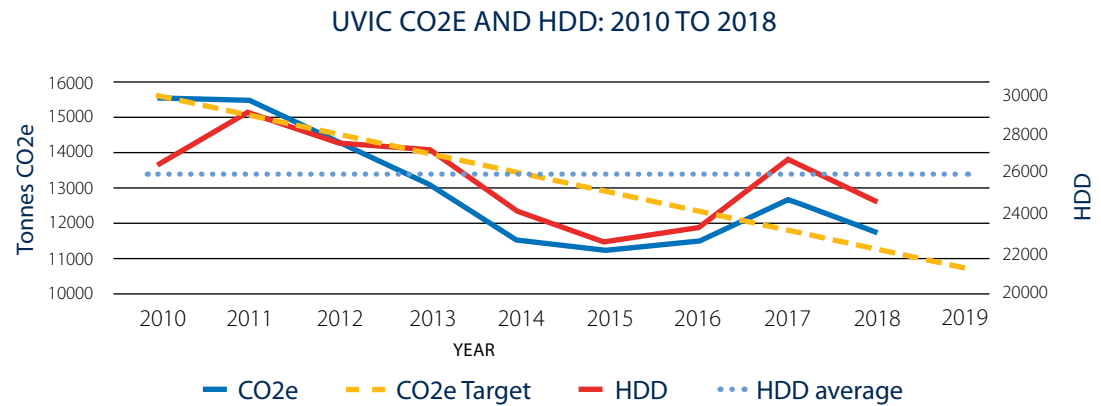


Figure 1: CO2e emissions and HDD at the University of Victoria 2010-2018

Mobile emissions decreased by 15 percent in 2018. UVic Facilities fleet accounted for the majority of mobile emissions produced in 2018 and can be partially attributed to continued electrification of the UVic fleet. The facilities fleet added three additional used Nissan Leafs in 2018. UVic also added a number of new vehicle charging stations. Academic research vehicles fuel consumption also decrease in 2018. The use of these vehicles and vessels fluctuates with research and teaching volume and therefore is expected to change year to year.

Electricity use on the UVic campus also decreased in 2018. This is partly a result of a decrease in heating demand in 2018 as discussed above and partly a result of the Enbridge pipeline rupture discussed further below. Energy management projects also contributed to the decrease. Approximately 30 percent of the decrease in electricity consumption was due to lighting projects, variable speed fan installations, control improvements, etc. The low cost of natural gas experienced since 2015 has made electricity projects, which provide a better payback, the most attractive from an energy management perspective.

Paper use increased in 2018 for the first time since 2011. A 7 percent increase in paper consumption was observed along with a 20 percent increase in associated emissions. UVic purchased a large amount of virgin paper content, which has a higher emission factor than recycled content, as compared to 2017.

Virgin paper content fluctuates year to year but the university shifted office supply purchasing contracts in 2018. The cost of recycled paper increased substantially under the new contract. The cost of virgin paper became approximately half that 100 percent post-consumer paper. As a result only 17 percent of the paper purchased under the new contract was 100 percent post-consumer versus approximately 80 percent in years prior.

Figure 2 below shows that natural gas accounts for 90 percent of total emissions, while electricity accounts for 6 percent. Emissions associated with fleet vehicles and paper purchases comprise the remainder.

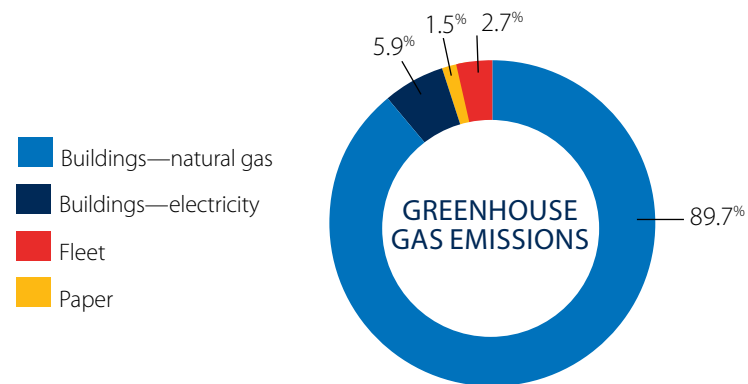


Figure 2: 2018 Greenhouse gas emissions percentage of each reporting category for the University of Victoria

## Changes to greenhouse gas emissions and offsets reporting from previous years

No changes were made to previous years' inventories.

## Offsets applied to become carbon neutral in 2018

The total greenhouse gas emissions for the University of Victoria in the year 2018 were 11,603 tCO<sub>2</sub>e, which includes all properties owned by the university on and off campus, properties leased from other entities for university business, and shared properties.

In accordance with the requirements of the Climate Change Accountability Act and Carbon Neutral Government Regulation, the University of Victoria is responsible for arranging for the retirement of the offsets for the 2018 calendar year. University of Victoria will pay an associated invoice to be issued by the Ministry of Environment and Climate Change Strategy for an amount equal to \$25 per tonne (plus GST) of offsets. The Ministry will ensure that these offsets are retired on the university's behalf.

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, 16 tCO<sub>2</sub>e emissions resulting from the use of bio-fuels were reported as part of UVic's greenhouse gas emissions profile in 2018. However, they were not offset as they are out-of-scope under Section 4(2) of the Carbon Neutral Government Regulation.

The total Greenhouse gas emissions that the University of Victoria is required to offset is 11,587 tCO<sub>2</sub>e (\$289,675 plus GST) for 2018.

## Actions taken to reduce greenhouse gas emissions in 2018

Building energy efficiency projects were completed in the 2018/2019 financial year; these included:

- The continued retrofit of UVic exterior walkway lighting to LED
- Optimization work and/or lighting upgrades which achieved an estimated 900,000 kWh savings in:
  - The Ian Stewart Complex
  - The Centre for Athletics Recreation and Special Abilities
  - The Continuing Studies Building
  - The Michael Williams Building
  - The Centennial Stadium Building
  - The Cunningham Building
  - The Human and Social Development Building
  - Student housing buildings

In total, 10 associated projects will prevent over 100 tonnes of emissions annually.

10 associated projects will prevent  
over 100 tonnes of emissions annually



The Enbridge pipeline rupture in October 2018 resulted in a significant drop in building heating use at UVic. In response to the rupture, and calls by Fortis BC for conservation, UVic reduced building temperature set points by 2-3 °C. Overall, energy use for heating was down 7 percent in 2018/2019 due to an extensive operation to reduce building temperature set points. This was in spite of the fact that the 2018/2019 winter was 1 percent colder than the 2017/2018 winter.

The campus shutdown during the Christmas holiday period was again coordinated by the Controls Group within Facilities Management. The heating and lighting schedules reduced starting December 23rd and remained as such until January 2nd. As a result, UVic prevented over 20 tCO<sub>2</sub>e emissions from being emitted. The amount saved in 2018 was smaller than in 2017. Building set point baselines were lower in 2018 as a result of the Enbridge pipeline rupture, which reduced the savings.

Construction of the District Energy Plant continued in 2018. The building will be fully commissioned in 2019. This new facility is expected to mitigate approximately 700 tCO<sub>2</sub>e emissions annually.

UVic continued the electrification of its fleet in 2018/2019 financial year. The facilities fleet added 3 additional used Nissan Leafs. UVic also added more new vehicle charging stations.

With funding from BC Hydro's Energy Wise Network program, the Sustainability Action Team program continued with behavioural change activities involving staff and faculty through our Green Labs program. The Green Labs program moved to address energy saving opportunities with Ultra-Low Temperature (ULT) freezers, which can use as much as a single family dwelling annually.

As a result of this engagement three faculty members changed their freezer set points, which will save an estimated 6000 kWh/year and extend the life of these freezers.

UVic also completed the Campus Cycling Plan in 2018. This plan identified a number of projects that will enable the university to increase the rate of cycling to campus and harmonize our cycling connections with the Districts of Saanich and Oak Bay.

## Plans to continue reducing greenhouse gas emissions

UVic will further reduce greenhouse gases in 2019 through the following activities:

- Conduct optimization work and or lighting upgrades the following buildings:
  - Engineering lab wing
  - Business and Economics
  - Strong Building
  - Engineering and Computer Science
  - Bob Wright Centre
  - MacLaurin D Wing
  - University Centre
- Implement projects through the UVic Revolving Sustainability Loan Fund
- Commission the new District Energy Plant and reduce the temperature of the district energy loop.
- Identify new energy saving projects that enable the university to reduce emission beyond our goal of a reduction 30 percent reduction of GHGs by 2019.

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](http://uvic.ca/sustainability)

