



# 2018 Carbon Neutral Action Report

LANGARA COLLEGE

May 2019

**snəwəyət̓ leləm̓.**

THE COLLEGE OF HIGHER LEARNING.

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### Introduction

At Langara College, we are deeply committed to being part of a sustainable society. We understand that the world's resources are finite and need to be used conservatively and wisely. We know that our choices, both big and small, impact our world and future generations. As an educational institution, we have a responsibility to lead initiatives that positively contribute to our community. Our goal is to foster and provide leadership to create more environmentally sound, socially just, and economically vibrant communities.

Our mission is to provide accessible, high-quality undergraduate, career, and continuing educational programs and services that meet the needs of our diverse learners and the communities we serve. This is guided by Langara's Strategic Plan, which complements the Academic Plan. While all outcomes in the plan are important, the thematic priority to support our mission for academic excellence is a focus on organizational and financial sustainability.

- Langara 2020 Strategic Plan: [www.langara.ca/strategic-plan](http://www.langara.ca/strategic-plan)
- Langara Academic Plan 2014-2019: <https://langara.ca/about-langara/academics/academic-plan/index.html>

As part of the College's commitment to reducing GHG emissions, an Environmental Responsibility Policy was established in June 2001. The purpose of the board governance policy is to provide direction to the College regarding the creation of learning and working environments characterized by social responsibility, the Board is committed to:

- protecting and enhancing the environment for future generations, and
- using and managing its own physical environment more sustainably.

Langara College has been working at reducing greenhouse gases (GHG) and increasing sustainability for many years and has been actively monitoring and managing energy and GHGs of its facilities for over 15 years. Since 2010, along with all BC public sector organizations (PSOs), as mandated under the Greenhouse Gas Reduction Targets Act, Langara has been reporting their annual GHG emissions and investing in offsets to achieve net-zero emissions.

The College is proud of its commitment and successes related to our GHG reduction effort. We will continue to increase environmental, financial, and social sustainability at Langara, in our city, and in our world.

#### DECLARATION STATEMENT

This Carbon Neutral Action Report for the period January 1, 2018 to December 31, 2018 summarizes our emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2018 to reduce our greenhouse gas emissions and our plans to continue reducing emissions in 2018 and beyond.

By June 30, 2019 Langara's latest Carbon Neutral Action Report will be posted to our website at <http://www.langara.ca/about-langara/sustainability/initiatives/carbon-neutral.html>.



## 2018 Carbon Neutral Action Report

### Overview

Langara has been able to reduce our energy usage and emissions on campus while we grow. Since 2009/10, the campus area has increased by 33%. During this same period, our energy usage on and emissions per sqft on campus have decreased by 20% and 43% respectively. As the campus grows, we continue to incorporate energy efficiency in our designs and ongoing upgrades.

Our new Science and Technology building received LEED Gold certification, making this the fourth LEED Gold building on campus. The building construction included phase one of a renewed central heating plant on campus. Langara is also upgrading many end-of-life systems to more efficient alternatives including upgrading lighting to LED throughout the campus. We recently completed the installation and commissioning of BTU metering across campus to help us understand energy usage/emissions by building and prioritize our projects.

Langara College is implementing several other sustainability projects and initiatives:

- Our recycling and composting initiatives have included standardization of our recycling sorting stations to be consistent with the City of Vancouver and Recycle BC. Our next goal is to install outdoor recycling bins on campus.
- We installed several additional water fill stations around the campus to help eliminate the need for single-use water bottles on campus, with a goal to have one on every floor of every building.
- We continue to install additional electric charging stations on campus; in 2018 we installed 4 stations, and applied for funding for a level 3 charging station.
- We are collaborating with departments and committees across Langara on sustainability initiatives. The College worked with the Langara College Foundation to support a student-led renewable energy project which resulted in the installation of the College's first solar panels on the new Science and Technology Building.
- We officially started a new Sustainability committee on campus. This committee is working with our Academic Plan Action Group on Environmental, Financial, and Social Sustainability to implement initiatives which include working toward a STARS (Sustainability Tracking Assessment Rating System) and began the first steps towards implementation of a new campus sustainability tour ([www.langara.ca/sustainability/sustainability-tour](http://www.langara.ca/sustainability/sustainability-tour))
- The Communications & Marketing Department created a Communications Plan which includes monthly sustainability news to over 1,600 employees in our employee newsletter *The Langara Post*, and messages to students and the general public on social media to spread sustainability awareness.
- We officially became a [Smoke Free campus](#) as of May 1, 2018.

A few highlights are included at the end of this report.

We continue to look for opportunities to make our campus more sustainable for future generations. Over the next few years, the campus will be expanding our renewed central heating plant to other buildings on campus (creating a campus-wide district heating system), including exploring ways to

## 2018 Carbon Neutral Action Report

further reduce our heating plant emissions. We plan to explore geothermal and heat pump opportunities as a first step. We are currently undergoing an integrated planning process which will inform our priorities for the next 3-5 years.

### Emissions Summary

The total emission offsets applied to become carbon neutral in 2018 was 1,424 tCO<sub>2</sub>e. As indicated in the chart below, 91% (82% + 9%) of Langara's tracked emissions are from building energy use.

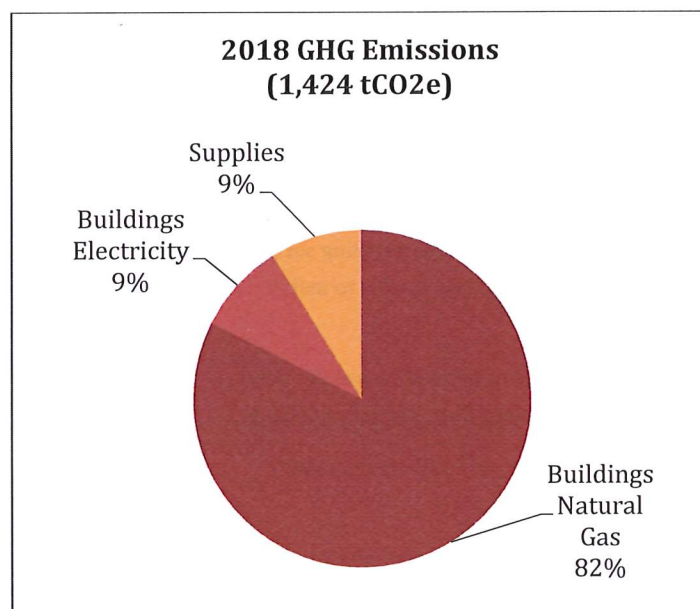


Figure 1: 2018 Emissions Breakdown

Langara College's GHG emissions for the mandatory reporting categories are summarized in the table below. Comparisons to 2018 calendar year and 2007 (the Ministry base-year for GHG target reduction) are included. The Buildings and Paper emissions are also charted on the next page.

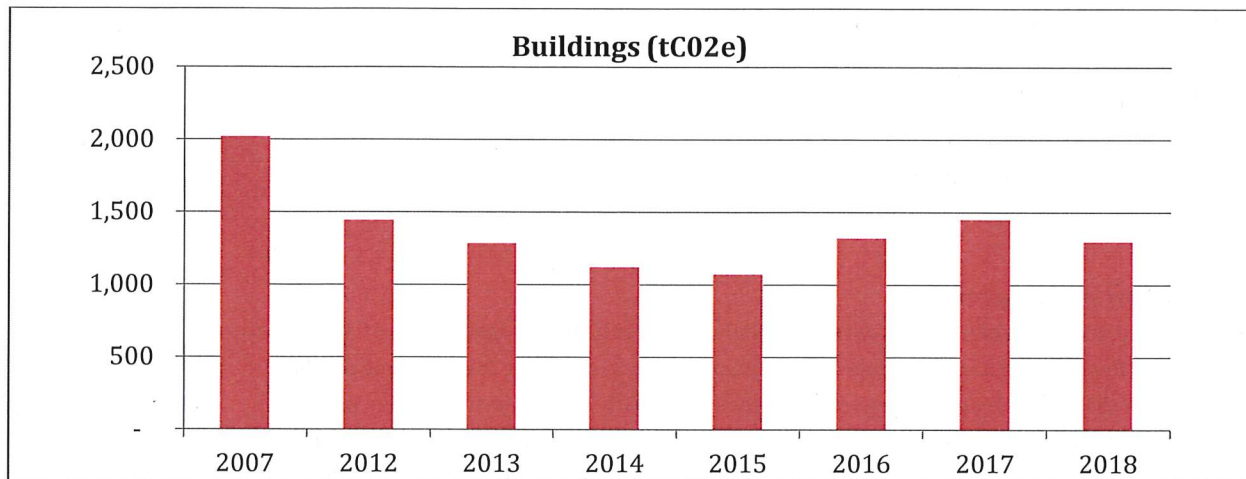
	2018 GHG Emissions (tCO <sub>2</sub> e)	2018 Results Compared to 2017	2018 Results Compared to 2007 Baseline
Buildings – Natural Gas	1,174	12% Decrease	36.5% Decrease
Buildings – Electricity	124	0% No change	27.7% Decrease
Supplies – Paper	124	7% Decrease	Not Available
Fleet	1.7		
Total	1,423	10% Decrease	35.7% Decrease

Table 1: Emissions Breakdown for 2018 Compared to Previous Year and Baseline (2007)

As required by the Greenhouse Gas Reduction Targets Act and Carbon Neutral Government Regulation, the results shown above are based on absolute emissions and have not been corrected for the impact of weather conditions.

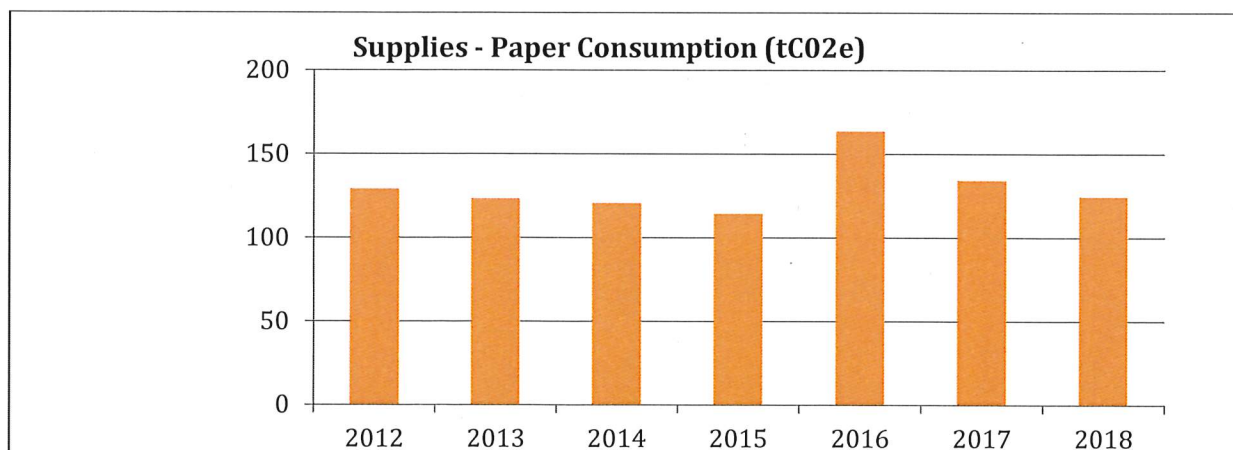
## 2018 Carbon Neutral Action Report

The chart below (Figure 2) shows the trend in GHG emissions for our Buildings compared to the base period year of 2007 and the previous five reporting years. As you can see in the bar graph and summarized in the previous Table 1, the emissions from buildings (natural gas and electricity combined) have increased from 2016 to 2017. This is expected as our new Science & Technology Building opened in September 2016, increasing the campus area by 20%; 2017 is the first full year of occupied operation for this new building.



**Figure 2: Building Emissions Trend (tCO2e) – Electricity & Natural Gas Emissions Combined**

Figure 3 below shows the trend in emissions for paper purchases on campus. As summarized in Table 1, paper consumption from 2016 to 2017 has decreased by 22%. We are happy to note that we have completed the installation of our new fleet of multi-function devices and printers across campus. With the addition of these new units we now have an accurate tool to track the consumption of paper and related resources. The information gathered will help us make better decisions and develop targeted reduction campaigns in an effort to reduce emissions and utilize our resources efficiently.



**Figure 3: Paper Supplies Emissions Trend (tCO2e)**



## Emissions and Offset Summary Table

Langara College GHG Emissions <sup>1</sup> and Offsets for 2018 (tCO <sub>2</sub> e <sup>2</sup> )	
<b>GHG's created in Calendar Year 2018</b>	
Total Emissions (tCO <sub>2</sub> e)	1,424
Total Offsets (tCO <sub>2</sub> e)	1,424
<b>Adjustments to GHG's Reported in Prior Years</b>	
Total Emissions (tCO <sub>2</sub> e)	0
Total Offsets (tCO <sub>2</sub> e)	0
<b>Total Emissions for Offset for the 2017 Reporting Year</b>	
Total Offsets (tCO <sub>2</sub> e)	1,424

### RETIREMENT OF OFFSETS

In accordance with the requirements of the Greenhouse Gas Reduction Targets Act and Carbon Neutral Government Regulation, Langara College (the Organization) is responsible for arranging for the retirement of the offsets obligation reported above for the 2018 calendar year, together with any adjustments reported for past calendar years. The Organization hereby agrees that, in exchange for the Ministry of Environment ensuring that these offsets are retired on the Organization's behalf, the Organization will pay the associated invoice to be issued by the Ministry in an amount equal to \$25 per tonne of offsets retired on its behalf plus GST.

### EXECUTIVE SIGN-OFF



Dr. Lane Trotter

President & CEO

June 14, 2019

Date

<sup>1</sup> Emissions are calculated as per Ministry of Environment, 2014 B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions (Victoria, BC: November 2014).

<sup>2</sup> Tonnes of Carbon Dioxide Equivalent as a standard measurement for GHGs by multiplying each gas' emissions by its global warming potential (GWP).

## Highlights

### STUDENTS HELP MAKE SOLAR POWER AT LANGARA POSSIBLE.



The first project funded by the Langara College Sustainability Fund was successfully implemented. The Science and Technology building was originally designed with the intention that solar panels could be added at a future date. In 2018, the passion of two students became the catalyst to turn this into a reality.

#### **Extract of published article for Langara's first solar panels:**

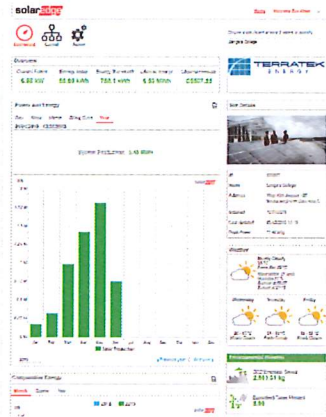
The Langara Sustainability Club, led by co-founders and environmental business students Cameron Bower and Sterling Keful, was the driving force behind fundraising for the project. Established in 2016, the club aims to raise awareness and take action to address environmental concerns at Langara.

Bower and Keful, guided by Langara School of Management instructor Deland Jessop, held a variety of fundraisers over the last year to support the project, including selling doughnuts.

"Cameron and Sterling were in my class and they had developed the Sustainability Club, and I mentioned this idea regarding solar panels being set up through charitable donations. I spoke to the Foundation and discovered that any donations would be matched," said Jessop. "This had me sold, so I donated some money to get it going and Cameron and Sterling were dedicated to raising funds through numerous events. They worked really hard to get the project finished."

Contributions to the Sustainability Fund were also made by a major individual donor, as well as through a grant courtesy of Vancity.

## 2018 Carbon Neutral Action Report

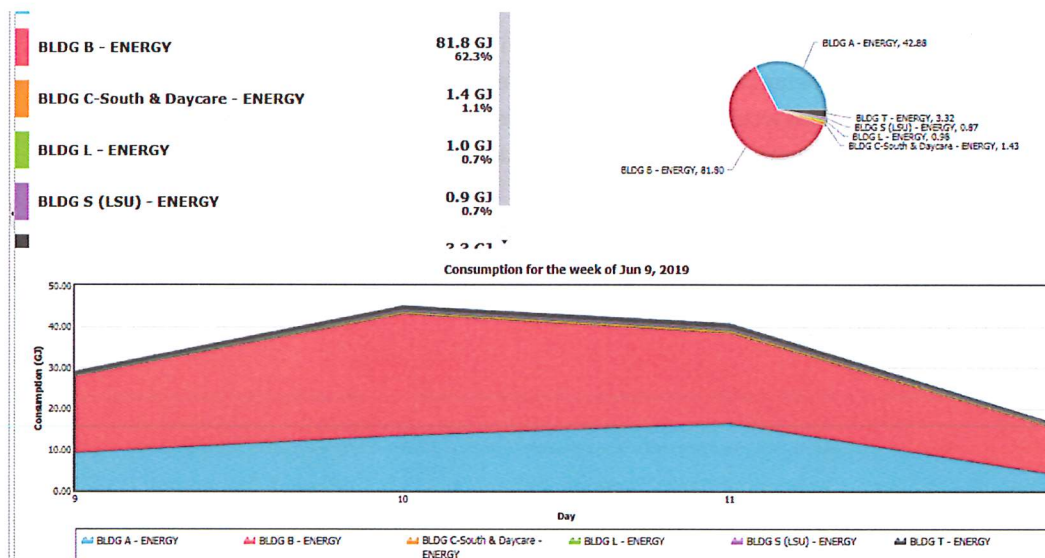


The electricity generated from the 6kW system that was installed is estimated to be approximately 6,000 kWh per year. This is the equivalent of an EV Car travelling 32,000kms, or 1,600 trips to Langara at an average of 20km per trip!

The Science and Technology Building, built to LEED® gold standards, is located on the northwest side of the campus by the Library building. It houses state-of-the-art biology, chemistry, physics, astronomy, nursing, and computing science labs, as well as a lecture hall, multi-purpose classrooms, and collaborative study spaces.

## COMPLETION OF BTU METER INSTALLATIONS

In 2018, we completed the installation and commissioning of our BTU metering across campus. This provided the much needed information to determine how the thermal energy from our central heating plant is distributed used around campus. With building level energy usage and emissions we are able to prioritize our actions to target high emissions opportunities.





## 2018 Carbon Neutral Action Report

### CAMPUS SUSTAINABILITY TOUR

#### Stepping towards sustainability.

##### LANGARA SUSTAINABILITY TOUR

What are some of the ways that Langara is eco-conscious? Take our self-guided tour to learn about the various ways Langara leads sustainability initiatives, from recycling to rain gardens.



Learn more.  
[www.langara.ca/sustainability](http://www.langara.ca/sustainability)

##### ABOUT THE TOUR

750m long (approx 900 steps)  
10-15 min duration

This tour is accessible via paved sidewalks, with exception of the community garden and apiary which are accessed by stairs and located on natural mulch.

Washrooms are available in all buildings.



##### T BUILDING AUDIO TOUR

Ready for more? Take an audio tour of Langara's award-winning sustainable T Building. The audio tour highlights the various green features of the state-of-the-art facilities and is designed to be listened to while perusing the building.

To access the tour, visit [www.buildingaudio.com](http://www.buildingaudio.com) and search for "Langara".

##### DO YOU KNOW?

- Every dollar that is recycled from a can or bottle on campus goes towards bursaries for our students.
- Langara has had an on-site worm compost for over 20 years.
- There are currently 38 solar panels providing renewable energy on campus.
- We have four programs in the topic of environment and sustainability (Environmental Studies, Biology, Ecology, and Applied Urban & Rural Planning).
- We have reduced our overall absolute GHG emissions from our buildings by 36% compared to our 2007 baseline.
- 63% of Langara's regularly commute to Langara via alternative transportation such as transit, cycling, or walking.\*
- Langara has been part of Bike to Work week since 2007.
- Langara has 48 water fill stations on campus to promote reusing your own water bottle. We have saved over 1.2 million plastic bottles to date!

\*2017 transportation survey



##### SUSTAINABILITY HIGHLIGHTS

- 1996 Langara joins the Energy Innovator Program.
- 2000 First strategic energy management plan is created.
- 2007 An Energy Management Coordinator is appointed. The College begins a project to revitalize the wetlands on campus.
- 2007 The Library & Classroom building is the first LEED® Gold® certified building on campus to open, and features energy efficient, geoswitch heating and cooling technology.
- 2009 The BC Hydro Energy Manager Program is initiated.
- 2009 Langara is approved for the BC Hydro Continuous Optimization Program. Adopts the Association of Canadian Community Colleges' Pan-Canadian Protocol for Sustainability.
- 2010 Community Garden is established on campus.
- 2012 The first electric vehicle charging stations are installed.
- With over 30 years of thinking green, IT continues paving the way forward by introducing the energy-efficient Cisco Thin Client model to the campus, which reduces energy output from 300W to less than 30W per device.
- 2016 Dedicated recycling depot is constructed.
- 2016 Apiary is established on campus.
- 2018 New LEED® Gold Science & Technology Building opened. Langara announces its first stand alone sustainability policy.
- 2018 First solar panels are installed.

\*LEED® Leadership in Energy and Efficient Design

#### Stepping towards sustainability.

##### LANGARA SUSTAINABILITY TOUR



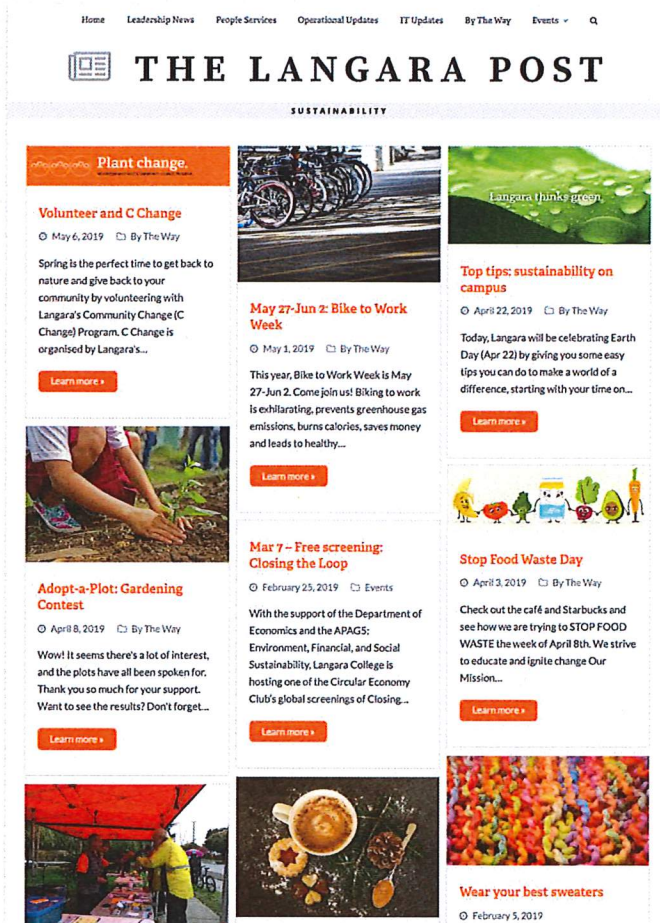
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Langara



## 2018 Carbon Neutral Action Report

### COMMUNICATION AND AWARENESS





# Part 1: CNAR Survey

## 1. General Information

**Name:** Dwayne Doornbosch, Patricia Baker

**Contact Email:** ddoornbosch@langara.ca, patriciabaker@langara.ca

**Organization Name:** Langara College

**Sector:** Post Secondary

**Role** - Please select your role(s) below.

*If more than one individual completed the survey, multiple categories may be selected:*

Energy Manager: No

Sustainability Coordinator: No

Administrative Assistant: No

Facilities/Operations Manager/Coordinator: No

CEO/President/Exec Director: No

Treasurer/Accounting: No

Superintendent: No

Other - Please Specify: Director and Associate Director, Facilities;

## A. Stationary Sources (e.g. Buildings, Power Generators): Fuel Combustion, Electricity use, Fugitive Emissions.

### 1. Actions taken by your organization in 2018 to support emissions reductions from buildings.

#### a) Do you have a strategy to reduce emissions from stationary sources?

Yes

If yes above, what are the main goals?: Continuously improve efficiency and reduce emissions, incorporating education where possible.

#### b) Whether you have a strategy or not (1.a), briefly describe your organization's plans to continue reducing emissions from stationary sources:

##### I. Over the medium-term term (1-5 years)

In particular, end of life equipment that requires upgrades are replaced with more efficient options - lighting, refrigeration, hvac units etc. We are also extending our new central heating plant to serve as a district heating system across campus. As we extend the system and upgrade the remaining old heating plant, we are considering additional ways of reducing the emissions of our primary heating source. We have been upgrading heating coils to low temperature in our buildings so our heating supply temperatures can be reduced and have an opportunity to make better use of low grade heating. We plan to investigate additional geo exchange potential on campus to feed our primary heating loop. We will continue to explore and stay informed on progress related to a future low carbon heating source along the Cambie corridor and how that could benefit the college. Rooftop units and similar systems will consider electric heat pump options. Further planning is planned and required to develop more detailed plans. We are also planning on piloting Real time energy management continuous optimization in one of our buildings. Continue solar PV installations across campus to increase renewable electricity component on campus. IT infrastructure thin clients upgrades and installs continue.

**II. Over the long term (6-10 years)**

The above applies, additional planning is required. As new buildings are built on campus, new regulations will be incorporated as required.

**c) Please describe your strategy's goals (if any) related to [energy audits](#).**

Over the next couple years, following the installation of several BTU energy meters, we will undertake building level audits and reconcile to energy usage to understand our energy usage further and to inform our planning process.

We have realtime energy usage (electrical and gas) by building available in dashboard format. This is monitored and reviewed frequently. Energy reports are provided monthly by an external consultant and highlight changes in energy usage. This information has highlighted problem areas and is used to prioritize action. ... this is considered 20%.

I. What % on average of your building portfolio has an energy audit completed each year (if any)? : 20

**d) Please describe your strategy's goals (if any) related to building retrofits.**

See above.

In general, upgrading to most efficient, lowest emissions options where feasible. Following LEED principals.

I. What % on average of your building portfolio is retrofitted each year in the following categories (if any) - click [here](#) for further information:

Minor retrofits (e.g., low cost, easy to implement measures including caulking, lighting, adding roof insulation, etc.) (%): 5

Major retrofits (e.g., replacing windows and doors, equipment replacement such as boilers, etc.) (%): 5

Deep retrofits (e.g., replacing roof, replacing the heating, ventilation and air-conditioning system with a renewable technology like a ground-source heat pump, etc.) (%): 5

**e) Please describe your strategy's [re/retro-commissioning](#) goals (if any)?**

Approximately 5 years ago, all our buildings were recommissioned, this was a very successful project.

This year we are planning to pilot real - time energy management in one of our buildings.

Additional commissioning was carried out following a large fan retrofit in our largest building, including ongoing review of energy usage and trend data to ensure system is performing as expected.

Ongoing energy monitoring and reporting is carried out monthly.

We plan to continue to re-commission buildings and systems and understand the value.

I. What % on average of your building portfolio do you recommission each year?: 15

**f) Do you keep records of Refrigerant gases category and refilling volumes?**

No

I. If yes, have you included the associated emissions in your reporting?

No

II. What, if any, mitigation approaches have been considered? Please describe.

We hire certified companies to carry out refrigeration servicing. Going forward we will request this information and track it.

**g) How many newly constructed buildings received at least LEED Gold certification in 2018 : 0**

I. How many newly constructed buildings did not receive LEED Gold certification?: 0

II. Please explain why LEED Gold certification was not obtained.

no new buildings

**h) Other actions? Please describe briefly.**

Looking into LEED V4 O&M and AASHE STARS for buildings and across campus.

## **B. Mobile Sources (Vehicles, Off-road/portable Equipment): Fuel Combustion:**

### **3. Actions taken by your organization in 2018 to support emissions reductions from mobile sources.**

**a) Do you have a strategy to reduce emissions from mobile sources?**

Yes

I. If yes, what are its goals?

Generally encourage use of public transit and active transportation and installing electric vehicle charging stations across campus.

Langara does not have a fleet of vehicles. Only one truck for our Theatre Arts program and a small snow plow.

**b) Whether you have a strategy or not (3.a), briefly describe your organization's plans to continue reducing emissions from mobile sources:**

I. Over the medium-term term (1-5 years)

Continue working on transit options for staff and students, including upgrading facilities and informing Translink of our usage requirements.

Generally installing electric vehicle charging stations, we added 4 in 2018. We plan to install another 4.

We have submitted an incentive application for a level 3 electric charging station.

We have installed conduit for additional stations on the south side of campus.

II. Over the long term (6-10 years)

To continue to monitor and install EV stations as required and encourage transit and active transportation.

**c) How many fleet vehicles did you purchase from the following categories:**

Electric Vehicle – EV - (e.g., Nissan Leaf, Chevy Bolt): 0

"Plug In" Electric Vehicle – PHEV (e.g., plug-in Prius, Chevy Volt): 0

Hybrid vehicle – HEV – non "Plug In"- (e.g., Toyota Highlander Hybrid): 0

Hydrogen fuel cell vehicle : 0

Natural gas/propane: 0

Gas/diesel vehicle: 0

I. If you purchased new gas/diesel vehicles, can you briefly explain why vehicles from the other categories were not chosen?

na



**d) How many existing EV charging stations does your organization have in each category:**

level 2: 8

How many level 2 stations (if any) are specifically for your fleet vehicles: 0

How many level 3 stations (if any) are specifically for your fleet vehicles: 0

**e) How many EV charging station(s) did you install in 2018 in each category:**

level 2: 4

**f) Other actions, please describe briefly (e.g. charging station feasibility studies, electrical panel upgrades, etc.)**

submitted application for level 3 charging station.

installed electrical conduit for future charging stations under long drive aisle in association with a drainage upgrade project.

**4. Please indicate the number of the vehicles in the following vehicle classes that are in your current fleet (including any purchased in 2018):**

Definitions:

- Light duty vehicles (LDVs) are designated primarily for transport of passengers <13 and GVWR<3900kg
- Light duty trucks (LDTs) are designated primarily for transport of light-weight cargo or that are equipped with special features such as four-wheel drive for off-road operation (include SUVs, vans, trucks with a GVWR<3,900kg )
- Heavy duty vehicles (HDV) includes vehicles with a GVWR>3,900 kg (e.g. ¾ tonne pick-up truck, transport trucks)

**a) Light duty vehicles (LDVs)**

Electric Vehicles – EV - (e.g., Nissan Leaf, Chevy Bolt): 0

"Plug In" Electric Vehicle – PHEV -- (e.g., plug-in Prius, Chevy Volt) : 0

Hybrid vehicles – HEV – (e.g., non "Plug In"- older Toyota Prius, Toyota Camry hybrid): 0

Hydrogen fuel cell vehicles: 0

Natural gas/propane: 0

Gas/diesel: 0

**b) Light duty trucks (LDTs)**

Electric Vehicles – EV : 0

"Plug In" Electric Vehicle – PHEV: 0

Hybrid vehicles – HEV – (e.g., non "Plug In"- older Ford Escape Hybrid, older Chevrolet Silverado pickup hybrid etc): 0

Hydrogen fuel cell vehicles: 0

Natural Gas/propane: 0

Gas/diesel: 1

**c) Heavy duty vehicles (HDV)**

Electric Vehicles – EV : 0

"Plug In" Electric Vehicle – PHEV : 0

Hybrid vehicles – HEV – (e.g., non "Plug In"): 0

Hydrogen fuel cell vehicles: 0

Natural Gas/propane: 0

Gas/diesel: 0

**5. Please indicate the number of the vehicles you plan to replace in your fleet:**

How much do you budget per LDV?: 0

How many LDVs do you plan to procure annually over the next 5 years?: 0

How much do you budget per LDT?: 0

How many LDTs do you plan to replace annually over the next 5 years?: 0

How much do you plan to spend per HDV?: 0

How many HDVs do you plan to replace annually over the next 5 years?: 0

**C. Office Paper: Indicate which actions your PSO took in 2018:**

**6. Actions taken by your organization in 2018 to support emissions reductions from paper supplies.**

**a) Do you have an Office Paper strategy?**

No

**I. If yes, what are its goals?**

nothing official

**b) Whether you have a strategy or not (6.a), briefly describe your organization's plans to continue reducing emissions from paper use:**

**I. Over the medium-term (1-5 years)**

All Multi-function devices are set to double sided printing as a default.

Looking at digital options for course packs and instructor notes.

Digital textbooks.

Login to print only.

**II. Over the long term (6-10 years)**

Potential large savings with digital approvals through new ERP system.

**c) Have an awareness campaign focused on reducing office paper use**

No

**d) Purchased alternate source paper (bamboo, hemp, wheat, etc.)**

Yes