

# 2016 Carbon Neutral Action Report

LANGARA COLLEGE

May 2017

**Langara.**

THE COLLEGE OF HIGHER LEARNING.

## 2016 Carbon Neutral Action Report

### 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>

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.

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 as follows:

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.

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, 2016 to December 31, 2016 summarizes our emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2016 to reduce our greenhouse gas emissions and our plans to continue reducing emissions in 2016 and beyond.

By June 30, 2017 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>.

## 2016 Carbon Neutral Action Report

### Emissions and Offset Summary Table

Langara College GHG Emissions <sup>1</sup> and Offsets for 2016 (tCO <sub>2</sub> e <sup>2</sup> )	
<b>GHG's created in Calendar Year 2016</b>	
Total Emissions (tCO <sub>2</sub> e)	1,485
Total Offsets (tCO <sub>2</sub> e)	1,485
<b>Adjustments to GHG's Reported in Prior Years</b>	
Total Emissions (tCO <sub>2</sub> e)	1
Total Offsets (tCO <sub>2</sub> e)	1
<b>Total Emissions for Offset for the 2016 Reporting Year</b>	
Total Offsets (tCO <sub>2</sub> e)	1,486

### 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 2016 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 19, 2017*

Date

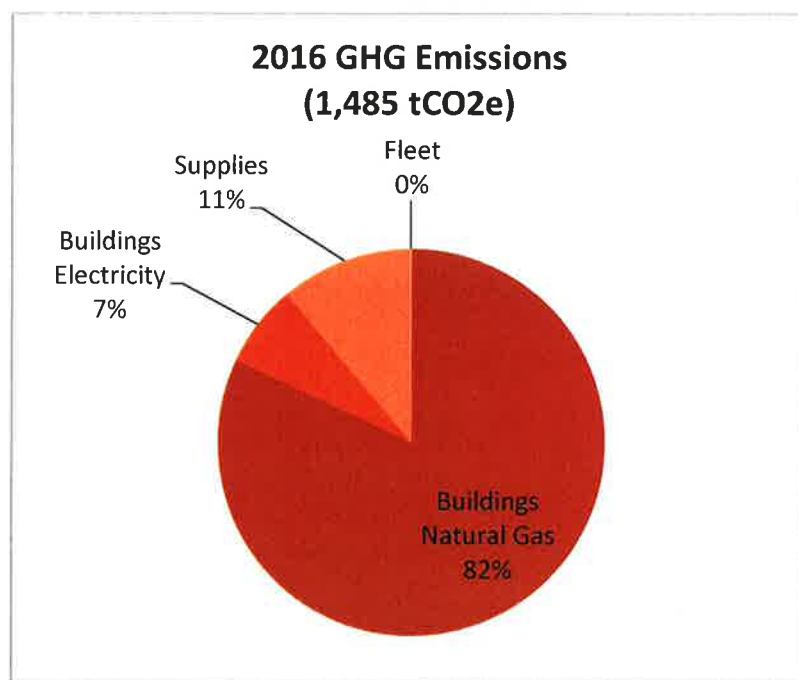
<sup>1</sup> Emissions are calculated as per Ministry of Environment, 2014 B.C. Best Practices Methodology for Quantifying Greenhouse Gas Emissions (Victoria, BC: November 2014).

<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).

## 2016 Carbon Neutral Action Report

### Overview

The total emission offsets applied to become carbon neutral in 2016 was 1,486 tCO<sub>2</sub>e. As indicated in the chart below, 89% (82% + 7%) of Langara's tracked emissions are from building energy use.



**Figure 1: 2016 Emissions Breakdown**

Langara College's GHG emissions for the mandatory reporting categories are summarized in the table below. Comparisons to 2015 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.

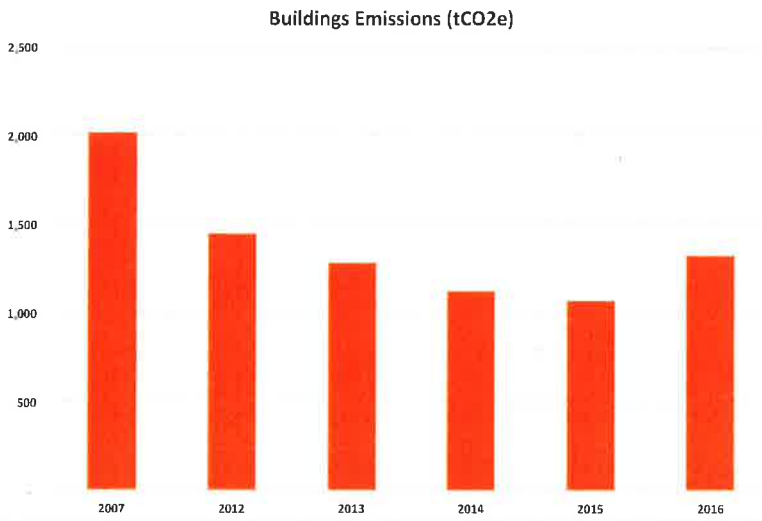
	2016 GHG Emissions (tCO <sub>2</sub> e)	2016 Results Compared to 2015	2016 Results Compared to 2007 Baseline
<b>Buildings – Natural Gas</b>	1,218	22% Increase	34% Decrease
<b>Buildings – Electricity</b>	103	30% Increase	40% Decrease
<b>Supplies – Paper</b>	164	49% Increase	Not Available
<b>Fleet</b>	0.01		
<b>Total</b>	1,485	<b>25% Increase</b>	<b>29% Decrease</b>

**Table 1: 2016 Emissions Breakdown Compared to Last Year and Base Year**

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.

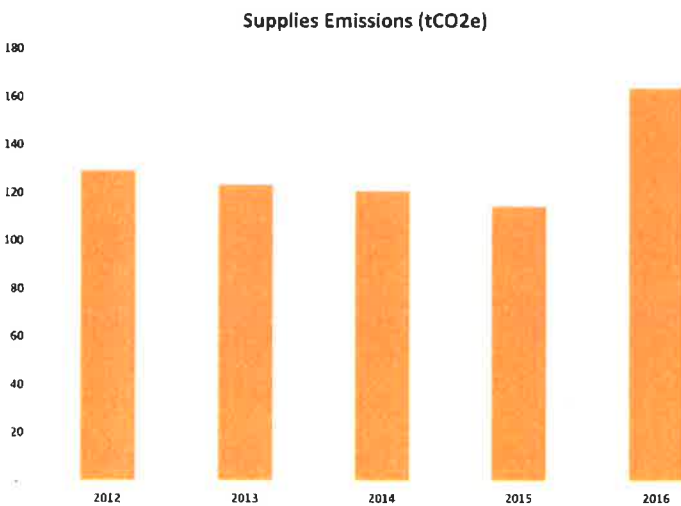
## 2016 Carbon Neutral Action Report

Figure 2 below shows the trend in GHG emissions for our Buildings compared to the base period year of 2007 and the previous four 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 2015 to 2016. This is expected as our new Science & Technology Building opened in September 2016, increasing the campus area by 20%. The campus population also increased. It is also noteworthy that we had an extremely cold winter and the fuel required for heating would be greater in 2016 compared to 2015.



**Figure 2: Building Emissions Trend**

Figure 3 below shows the trend in emissions for paper purchases on campus. The significant increase in paper, from 2015 to 2016 of 49%, as summarized in Table 1 is noteworthy. It is expected a portion of the increase is the result of a larger campus population; other contributing factors will be investigated.



**Figure 3: Paper Supplies Emissions Trend**

## 2016 Carbon Neutral Action Report

### Emission Reduction Activities 2016

As shown in the 2016 Emissions Breakdown pie chart (Figure1), 89% of the emissions from Langara's operations are related to building energy usage. Emissions reduction activities for 2016 related to building are summarized below in four key areas: Green Buildings, Green Renewal, Operations & Maintenance, and Engagement & Awareness.

#### Green Buildings

The Science & Technology Building features over 12,000 square metres of new campus space allocated over five storeys. On the west side, a dramatic 16-metre cantilevered portion incorporates a skylight window that allows natural daylight to penetrate through to the ground below. Registrar & Enrolment Services and food outlets anchor the main floor, with event space and meeting rooms on the second level. State-of-the-art chemistry, biology, physics, astronomy, nursing, and computing science labs populate the upper three floors. There are also collaborative study spaces, a greenhouse for instructional purposes, and an observation deck on the roof. Langara is pursuing third party certification via the Canada Green Building Council, aiming for a Gold level in their Leadership in Energy and Environment Design (LEED) standard. The project has incorporated green building features such as a low emissivity roof, the use of local, sustainable building materials, an energy-efficient building envelope, and low-flow fume hoods with adjustable sashes.

#### Other Green Features:

- Proximity to major transportation hubs
- Protected a landscaped area from future development equal to the building footprint (2,087 m<sup>2</sup>)
- Modeled to save the equivalent of an Olympic swimming pool of water each year through washroom fixture efficiencies
- Innovative water-side heat recovery system that targets zero thermal energy waste and preheats domestic hot water
- Outdoor views in over 90% of the regularly occupied areas for greater indoor environment quality

*Photo: Andrew Latreille*



## 2016 Carbon Neutral Action Report

### Green Renewal

- Green IT: Ongoing campus-wide server virtualization implementation continues
- To save energy and maintenance costs associated with aging equipment, Langara is upgrading exterior lighting to an energy-efficient LED program.
- As campus renovations are carried out, lighting is renewed with more energy-efficient LED options that improve lighting quality and incorporate new dimming controls. The new lighting replaces aging, end-of-life fixtures and will reduce maintenance costs related to lamp change-outs. The following renovated spaces were upgraded with new LED lighting:
  - C Building 4th and 5th floor classroom upgrades
  - S032 - Movement room
  - B Building - 2 computer labs
  - B Building - Disability Services renovation
  - B Building – Senior Leadership, Communications & Marketing, and Langara College Foundation office renovations

### Operations & Maintenance

- Training for operators on building automation systems, including customized graphics
- Set-up and implementation of new Preventative Maintenance Work Order system

### Engagement & Awareness

- Participation in Energy Wise Program: Developed a "Shut the Sash" program to educate and engage students and faculty in understanding how to operate the fume hood and why it is important
- Partnership with Open Green Building Society: Produced a [green building audio tour](#) for the new Science & Technology Building to engage with students, employees, visitors, and green building aficionados about our newest green facility through a convenient, accessible audio format

### LANGARA SCIENCE AND TECHNOLOGY BUILDING



▶ AUDIO TOUR: Langara Science and Technology Building - Wendy Lannard, Facilities Director, Langara College & Kori Chan, partner architect at Proscenium Architecture + Interiors



# Shut the sash.

## LANGARA GUIDE TO USING LABORATORY FUME HOODS

Langara's new Science & Technology Building (T Building) features over 12,000 square metres of new campus space allocated over five storeys. State-of-the-art chemistry, biology, physics, astronomy, nursing, and computing science labs populate the upper three floors. The new building targets LEED Gold standards. It incorporates green building features such as reflective and green roofs, an energy-efficient building envelope, and low-flow fume hoods with adjustable sashes.

### ALL YOU NEED TO KNOW ABOUT FUME HOODS

#### Variable Air Volume fume hood (VAV)

The T Building labs are equipped with Variable Air Volume fume hoods. A variable air volume fume hood operates in a way that when the sash, or window, to the fume hood is pulled down to a certain height, the fan speed will decrease, requiring less energy to operate.

#### Why shut the sash?

- VAVs save energy and increase safety
- As sash height is lowered, less air is exhausted, and less fresh air needs to be brought in and conditioned

#### How can I help?

- By closing fume hoods when they are not in use, we can help conserve the environment.

lower sash = less air exhausted

- lower energy costs (electricity & gas)
- lower GHG emissions
- lower operating costs



### INCREASE YOUR SAFETY & USE LESS ENERGY

A typical fume hood requires significant flow of conditioned air. Electricity and gas are required to run the exhaust fans that move the air through the building, as well as to regulate air temperature. Lowering the sash when not in use reduces the amount of air that needs to be conditioned, helping reduce our energy costs and impact on the environment.

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## 2016 Carbon Neutral Action Report

### Other Sustainability Activities in 2016

#### Waste Management

- A Langara sustainability co-op student conducted research, engaged stakeholders, and initiated a new recycling signage program in September to coincide with the opening of the new Science & Technology Building

#### Transportation

- Participated in Bike to Work Week and BC Commuter Challenger events: <https://langara.ca/news-and-events/langara-news/2016/160624-miles-for-sustainability.html>
- Hosted Bike to Work Week Celebration Stations in May and October
- Developed an active transportation survey to be carried out in fall 2017
- Fully transitioned student U-Pass BC program to Compass Card
- Installed a stand-alone bike repair station in underground parkade
- Launched a spare parts program for employee bicycle repairs

#### Academic Plan Action Group 5 (APAG5)

- Participated in the inaugural Academic Plan Mini-conference, "Curriculum for Global Citizenry"
- Hired a Langara School of Management co-op student to carry out an initial review and data collection exercise to understand our potential application for a "STARS" rating. AASHE (Association for the Advancement of Sustainability in Higher Education) has developed a Sustainability Tracking Assessment & Rating System (STARS), which provides an avenue for international recognition of an institution's progress along the path of sustainability and helps to identify best practices and generate future goals. It also acts as a tool to engage the college community in building a culture of sustainability.
- New Langara retirees engagement program was formed out of the work initiated by the APAG5 committee
- Sharing table event promoted the reuse of household items



# Go team go!

2017 BC COMMUTER CHALLENGE | JUNE 4 – 10

Langara is participating in the BC Commuter Challenge this year and we want to win. It's as easy as 1-2-3!

1. From June 4-10, commute to work sustainably by walking, biking, carpooling, car sharing, using public transit, or telecommuting.
2. Register yourself on our Langara team (<http://app.commuterchallenge.ca/commuter/register/VK.YDhu>) - it only takes a minute!
3. Log your daily commutes for the week online.

Langara employees who register have a chance to win one of two \$50 gift cards. You could also win some amazing sponsored prizes through BC Commuter Challenge, including:

- Pre-loaded Compass Cards
- Car share vouchers (Evo, Modu)
- Products and gear (Patagonia, MEC, Keurig)
- Lessons and rentals (bouldering, rope course, kayaking)
- Arts, sports, and entertainment (MOA, VSO, VIFF, Vancouver Canadians)
- Tour and outdoor activities (Whistler, Sea to Sky Gondola, VanDusen)

Some prizes are awarded based on highest participation, so let's be a winning team! You'll be promoting sustainable transportation and healthy living too.

For more information, visit the BC Commuter Challenge website or contact your Langara workplace coordinator Steve Daniell at [sdaniell@langara.ca](mailto:sdaniell@langara.ca).

Learn more.  
[www.commuterchallengebc.ca](http://www.commuterchallengebc.ca)  
[www.commuterchallengebc.ca/prizes/](http://www.commuterchallengebc.ca/prizes/)



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## 2016 Carbon Neutral Action Report

### Plans for GHG Emissions Reduction in 2017 and Beyond

Our plans to continue reducing greenhouse gas emissions in 2017 and beyond include the following initiatives:

#### Green Renewal

- Strategic Investment Fund (SIF) for 'A' Building Major Fan Systems Renewal: In October 2016, Langara received a \$1.58 million investment from the federal and provincial governments to support the replacement of two 1970-era, energy-intensive ventilation systems that are reaching the end of their useful life in 'A' Building. The new fan systems will improve air distribution, reduce operating costs, and decrease energy consumption at Langara. This work will be carried out in 2017 and completed by March 31, 2018.
- Continue exterior lighting upgrades (T8 to LED), as well as interior lighting upgrades during renovations
- Planning and upgrades of end-of-life kitchen equipment

#### Operations & Maintenance

- Continue timely repairs of equipment to minimize impact on energy usage
- Additional metering of heating loads at the building level for better energy monitoring

#### Engagement & Awareness

- Continue to raise awareness around plug loads, inventory space heaters, and utilizing the most efficient option where required
- Continue with the "Shut the Sash" campaign and other similar campaigns
- Promote green building audio tour to highlight green features of the new Science & Technology Building
- Hire a Langara co-op student to help with student engagement related to energy and waste management

### Other Sustainability Activities in 2017 and Beyond

#### Waste Management

- Transition all remaining campus buildings to use four-stream recycling stations with new consistent signage
- Launch office supplies recycling and reuse initiative

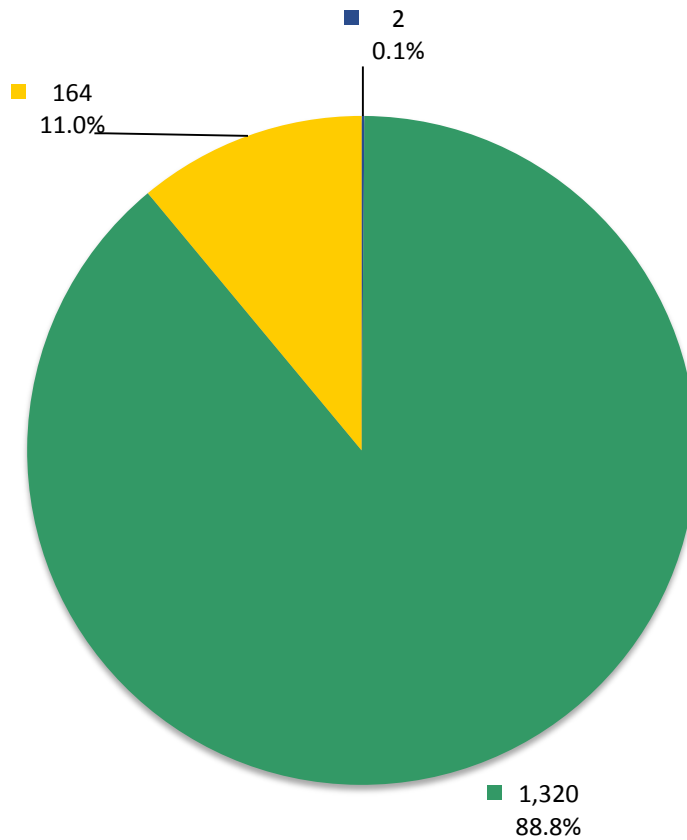
#### Transportation

- Participate in Bike to Work Week and BC Commuter Challenger events
- Launch active transportation survey in the fall with HASTe BC

#### Academic Plan Action Group 5 (APAG5)

- Recycling
- Increased communications related to sustainability on campus

**Langara College  
Greenhouse Gas Emissions by Source  
for the 2016 Calendar Year (tCO<sub>2</sub>e\*)**



**Total Emissions: 1,485**

- Mobile Fuel Combustion (Fleet and other mobile equipment)
- Stationary Fuel Combustion (Building Heating and Generators) and Electricity
- Supplies (Paper)

**Offsets Applied to Become Carbon Neutral in 2016 (Generated May 15, 2017 4:27 PM)**

Total offsets required: **1,485**. Total offset investment: **\$37,125**. Emissions which do not require offsets: **0** \*\*

\*Tonnes of carbon dioxide equivalent (tCO<sub>2</sub>e) is a standard unit of measure in which all types of greenhouse gases are expressed based on their global warming potential relative to carbon dioxide.

\*\* Under the *Carbon Neutral Government Regulation of the Greenhouse Gas Reduction Targets Act*, all emissions from the sources listed above must be reported. As outlined in the regulation, some emissions do not require offsets.

# 2016 Carbon Neutral Action Report Survey

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Part One (external)

Contact Name(s):

*Patricia Baker*

Organization Name:

*Langara College*

Please select your sector:

- Post-Secondary Institution

1) Stationary Sources (Buildings, Power Generators): Fuel Combustion, Electricity use, Fugitive Emissions.

During 2016, did your organization take any of the following actions to support emissions reductions from buildings?

Select all that apply

- Performed energy retrofits of the organization's buildings.: If yes, how many buildings? Throughout Campus
- Built, or are building new LEED Gold or other "Green" buildings.: If yes, how many buildings? Completed 1 LEED Gold Building
- Other actions? Please describe briefly.: Upgraded Exterior Lighting to LED

Briefly describe your organization's plans to continue reducing emissions from its stationary sources in future years.

*In general, continuing with energy upgrades, training operators to understand new systems, install metering to understand and manage energy usage, raise awareness around energy efficiency and behaviors, including specific campaigns for labs.*

*Specific projects planned for 2017 include:*

- Upgrading largest fan systems on campus (in our oldest building) from constant volume to variable air volume with new building controls.*
- Continue to upgrade exterior lighting and other areas being renovated to LED type.*
- planning and upgrades to existing kitchen equipment*
- operator training, including proactive repairs to equipment to minimize energy impact*
- install additional metering to measure and manage energy as well as better understanding of loads for future upgrades.*
- continue to raise awareness around plug loads*
- continue "shut the sash" campaign and other similar campaigns.*
- hire coop student to support student engagement in projects.*
- support a student lead initiative to add Solar / Renewables to campus.*

During 2016, did your organization participate in utility-sponsored energy demand management program(s) (e.g. BC Hydro's Energy Management (Manager))?

Yes

If yes, please describe briefly:

*Yes, Langara participates in the BC Hydro Energy Manager program. We also received incentives for participation in BC Hydro New Construction Program as well as LED lighting incentives.*

2) Mobile Sources (Vehicles, Off-road/Portable Equipment): Fuel Combustion.

During 2016, did your organization take any of the following actions to support emission reductions from its mobile sources?

Select all that apply

- 
- Other actions? Please describe briefly.: Continue to promote transit, carpooling and biking.
- 

Briefly describe your organization's plans to continue reducing emissions from its mobile sources in future years.

*We do not have fleet vehicles, however, we are located next to the Langara Skytrain station and we promote use of transit, carpools and biking etc. With our newest building completed in fall of 2016, new end of trip facilities were made to support alternative modes of transportation. A transportation survey is planned for 2017 in cooperation with HASTe BC*

3) Supplies (Paper):

During 2016, did your organization take any of the following actions to support emissions reductions from paper supplies?

Select all that apply

*(No response)*

Briefly describe your organization's plans to continue reducing emissions associated with its office paper use in future years.

*We currently purchase paper with 30% recycled content. We continue to install multi-functional devices which can track paper consumption.*



4) Other Sustainability Actions:

Business Travel:

During 2016, did your organization take any of the following actions to support emissions reductions from business travel?

Select all that apply

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- Encouraged alternative travel for business (e.g. bicycles, public transit, walking)
- 

Education Awareness:

During 2016, did your organization have any of the following programs or initiatives to support sustainability education and awareness?

Select all that apply

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- Green, Sustainability or Climate Action Team
- Other, please describe briefly: Hosted an Academic Conference "Inspiring Innovation Across Disciplines". Included a section to learn about Green Feature of our New Science and Technology Building.

Other Sustainability Actions:

During 2016, did your organization have any of the following programs or initiatives to support sustainability?

Select all that apply

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- An operations policy or program to facilitate the reduction and diversion of building occupant waste (e.g., composting, collection of plastics, batteries) from landfills or incineration facilities
- Other, please describe briefly: Green cleaning products and landscaping initiatives, including continue with community garden and apiary.