

2014 Carbon Neutral Action Report

LANGARA COLLEGE | MAY 2015

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.

As part of the college's commitment to reducing Green House Gas (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

In addition, Langara's policy is to have any new building constructions be LEED® Gold Certified at minimum. Our new Science & Technology Building slated for completion in 2016 will be built to this standard. To date, Langara's Library Building has captured national and international attention for its environmentally progressive features. The Library is a landmark facility on campus and in the community. Together with the Students' Union Building and renewed C Building (formerly the Library and now home to the College's administration), all three buildings received LEED® Gold Certification for providing optimum comfort and energy efficiency.

Langara College has been working at reducing greenhouse gases and increasing sustainability for many years. This has come from internal changes and policies as well as from external incentive programs developed by BC Hydro, Office of Energy Efficiency, Natural Resources Canada, and Colleges and Institutes Canada. Langara College has been reporting their Energy Management Action Plan through the Canadian GHG Challenge Registry annually and has been recognized as a Gold Champion Level Reporter since 1999; this registry closed in 2011.

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.



About Langara

Located in beautiful Vancouver, BC, Canada, Langara College provides University, Career, and Continuing Studies education to more than 21,000 students annually. With over 1,700 courses and 130 programs offered, Langara's expansive academic breadth and depth allows students of all ages, backgrounds, and life stages to choose their own educational path.

Declaration Statement

This Carbon Neutral Action Report for the period January 1st to December 31st, 2014 summarizes our emissions profile, the amount of offsets purchased to reach net zero emissions, the actions we have taken in 2014 to reduce our greenhouse gas emissions and our plans to continue reducing emissions in 2015 and beyond. By June 30 Langara's final Carbon Neutral Action Report will be posted to our website at: <http://www.langara.bc.ca/about-langara/sustainability/initiatives/carbon-neutral.html>

TABLE 1: EMISSIONS AND OFFSETS SUMMARY

LANGARA COLLEGE GHG EMISSIONS¹ AND OFFSETS FOR 2014 (tCO₂e²)	
GHG's created in Calendar Year 2014	
Total Emissions (tCO ₂ e)	1,243
Total Offsets (tCO ₂ e)	1,243
Adjustments to GHG's Reported in Prior Years	
Total Emissions (tCO ₂ e)	5
Total Offsets (tCO ₂ e)	5
Total Emissions for Offset for the 2014 Reporting Year	
Total Offsets (tCO ₂ e)	1,248

The College is proud of its efforts to reduce energy usage and greenhouse gas emissions. We look forward to continuing our role as environmental stewards.

W Lannard

Wendy Lannard
Director, Facilities and Capital Planning
Langara College

June 3, 2015

Date

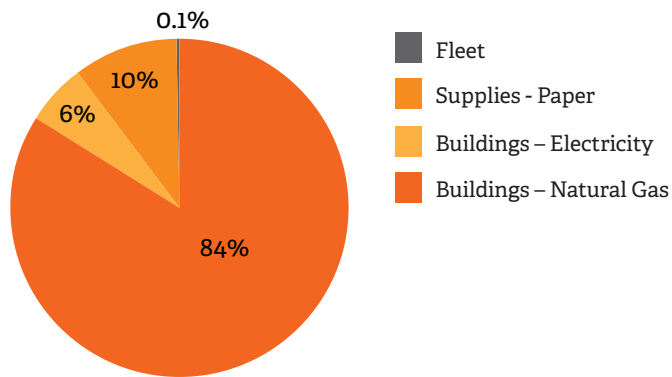
¹ Emissions are calculated as per Ministry of Environment, 2014 B.C. *Best Practices Methodology for Quantifying Greenhouse Gas Emissions* (Victoria, BC: November 2014).

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

Overview

The total emission offsets applied to become carbon neutral in 2014 was 1,243 tCO₂e. Langara College paid over \$31,000 in carbon offsets to become carbon neutral. As indicated in the chart below, 90% of Langara's tracked emissions are from building energy use; therefore efforts for emission reduction have been focused mainly on building energy.

FIGURE 1: 2014 EMISSIONS BREAKDOWN



Langara College's GHG Emissions for the mandatory reporting categories are summarized in the table below and shown in comparison to the past year, in addition to 2007, the Ministry base-year for GHG target reduction.

TABLE 2: 2014 EMISSIONS BREAKDOWN COMPARED TO LAST YEAR AND BASE YEAR

	2014 GHG EMISSIONS (TCO ₂ E)	2014 RESULTS COMPARED TO 2013 BASELINE	2014 RESULTS COMPARED TO 2007
Buildings - Natural Gas	1,041	11% Decrease	44% Decrease
Buildings - Electricity	80	33% Decrease	53% Decrease
Supplies - Paper	121	2% Decrease	Not Available
Fleet	1.3	12% Decrease	49% Decrease
Total	1,243	11% Decrease	44% Decrease

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. Some of the emission reduction in building energy use was due to the warm weather³ in 2014. Additionally, some of the building electricity reduction was due to the reduction in electricity emission factor⁴ in 2014.

Energy management efforts that lead to the bulk of the emission reductions are described in the following section.

³ The heating requirements for a given structure at a specific location are considered to be directly proportional to the number of Heating Degree Days (HDDs) at that location. HDDs are the number of degrees that a day's average temperature is below the temperature below which buildings need to be heated. Assuming a building balance point temperature of 15°C, 2014 HDDs were 6% lower than 2013.

⁴ In a hydroelectric-based power system such as British Columbia's, the GHG emissions from electricity can vary significantly from year to year. This variation is influenced by both the quantity purchased by consumers, and variation in water supply conditions and reservoir levels. 2014 electrical emissions used for this report were 3% lower than 2013.

Emissions Reduction Activities 2014

Energy management initiatives taken to reduce greenhouse gas emission in 2014 included:

- Green IT – thin client desktop and server virtualization continued at Langara this year. This is an ongoing initiative over three years and will reduce campus IT electrical usage by approximately 80%.
- Aligning building heating, ventilation, and air-conditioning (HVAC) control with the building operation schedule – This was done via the building direct digital control (DDC) at B Building, Library, LSU, and C Building. Additionally, global holiday scheduling was implemented on DDC to ensure building systems are turned down on statutory holidays. This initiative cut down on hours of equipment run time and reduced ventilation demand, lowering the buildings' electrical and natural gas consumption.
- Installing additional controls – additional occupancy sensors were added for classroom lighting control; server-room air cooling units were tied into DDC for better control; two additional supply fans were added to DDC for integrated control.
- DDC upgrade at Library, C and LSU resulting in better HVAC control and reduced energy use at the buildings.

Additional to the initiatives above, other actions that contributed to reducing emission reduction at Langara included:

- Participating in the BC Hydro Energy Manager Program.
- Continuing monitoring, targeting and reporting (MT&R) the buildings' energy use – from a billing perspective, operationally, as well as via a public display screen sharing the results with the campus.
- Training and coaching for operators on building automation systems.
- Face time with staff and students during occupancy surveys, welcome week, and participation in international Sweater Day campaign.

Plans to Continue Reduction of Greenhouse Gas Emissions

Continued greenhouse gas emission reduction for 2015 is planned through the following initiatives:

- Continuation of Green IT thin client upgrades
- Lighting retrofit to LED where feasible
- Library lighting controls improvement
- Continuation of DDC review for fine-tuning and optimized operation of buildings
- Coil Cleaning for main air handling units

2014 Carbon Neutral Action Report (CNAR) - Part 2 ACTIONS

Organization Name

Langara College

Actions Taken to Reduce Emissions

1) Stationary Fuel Combustion, Electricity (Buildings): Indicate which actions were taken in 2014:

Performed energy retrofits on existing buildings

No

Built or are building new LEED Gold or other "Green" buildings.

Yes

Undertook an evaluation of overall building energy use.

Yes

Please list any other actions taken to reduce emissions from Buildings:

- Green IT – thin client desktop and server virtualization continued at Langara this year. This is an ongoing initiative over three years and will reduce campus IT electrical usage by approximately 80%.
- Aligning building heating, ventilation, and air-conditioning (HVAC) control with the building operation schedule – This was done via the building direct digital control (DDC) at B Building, Library, LSU, and C Building. Additionally, global holiday scheduling was implemented on DDC to ensure building systems are turned down on statutory holidays. This initiative cut down on hours of equipment run time and reduced ventilation demand, lowering the buildings' electrical and natural gas consumption.
- Installing additional controls – additional occupancy sensors were added for classroom lighting

control; server-room air cooling units were tied into DDC for better control; two additional supply fans were added to DDC for integrated control.

- DDC upgrade at Library, C and LSU resulting in better HVAC control and reduced energy use at the buildings.

2) Mobile Fleet Combustion (Fleet and other vehicles):Indicate which actions were taken in 2014:

Do you have a fleet?

No

Replaced existing vehicles with more fuel efficient vehicles (gas/diesel)

No

Replaced existing vehicles with hybrid or electric vehicles

No

Reduced the overall number of fleet vehicles

Yes

Took steps to drive less than last year

No

Please list any other actions taken to reduce emission from fleet:

Fleet portfolio is only one vehicle, with minimal use.

3) Supplies (Paper):Indicate which actions were taken in 2014:

Used less paper than previous year

Yes

Used only 100% recycled paper

No

Used some recycled paper

Yes

Used alternate source paper (Bamboo, hemp, etc.)

No

Please list any other actions taken to reduce emissions from paper use:

(No response)

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Actions Taken to Reduce Emissions - continued

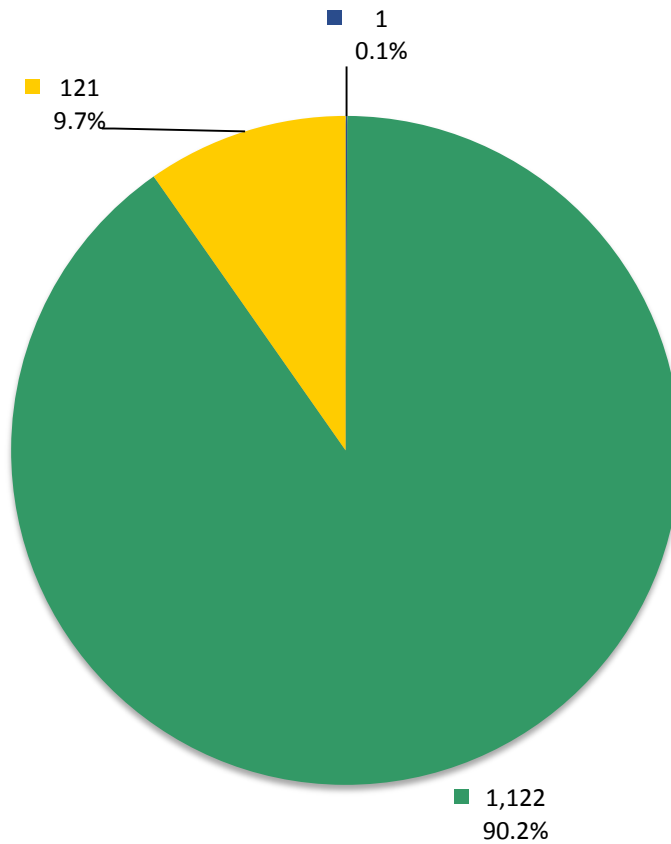
Explain how you plan to continue minimizing emissions in 2015 and future years:

Langara will continue to minimize emissions in 2015 and future years by identifying and implementing building energy reduction projects as planned in the 3yr SEMP; and participating in international and internal campaigns for sustainability to increase awareness to reduce paper use.

If you wish to list any other "sustainability actions" outside of buildings, fleet, paper and travel check "yes". This reporting is optional.

No

**Langara College
Greenhouse Gas Emissions by Source
for the 2014 Calendar Year (tCO₂e*)**



Total Emissions: 1,243

- 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 2014 (Generated June 23, 2015 4:22 PM)

Total offsets required: **1,243**. Total offset investment: **\$31,075**. Emissions which do not require offsets: **0** **

*Tonnes of carbon dioxide equivalent (tCO₂e) 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.