



2015 Carbon Neutral Action Report

Submitted under the Carbon Neutral Government Regulation of the BC Greenhouse Gas Reduction Targets Act



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

By June 30, 2016, VCC's final Carbon Neutral Action Report will be posted to our website at www.vcc.ca.

Emissions and Offsets Summary:

GHG Emissions created in Calendar Year	r 2015:
Total Emissions (tCO ₂ e)	2,041
Total Offsets (tCO ₂ e)	2,041
Adjustments to GHG Emissions Reporte	d in Prior Years:
Total Emissions (tCO ₂ e)	0
Total Emissions (tCO ₂ e)	0
Total Emissions (tCO ₂ e) Total Offsets (tCO ₂ e) Grand Total Offsets for the 2015 Report	0 0 ing Year:

Retirement of Offsets:

In accordance with the requirements of the Greenhouse Gas Reduction Targets Act and Carbon Neutral Government Regulation, Vancouver Community College (the Organization) is responsible for arranging for the retirement of the offsets obligation reported above for the 2015 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.

Signature

MAY 27, 2016.

Dr. Peter Nunoda Name (please print)

President and CEO

Title

VCC 2012 Carbon Neutral Action Report

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Overview

Vancouver Community College (VCC) believes that a healthy environment is essential for the health and well-being of present and future generations. At VCC, we are concerned about the quality of the natural environment and building a sustainable society and are committed to making a difference.

VCC takes the responsibility of ensuring our students are prepared to play their role in a sustainable future very seriously. It is our hope to inspire these graduates to contribute to sustainability in their homes, communities and workplaces.

VCC has made strides in achieving our environmental sustainability goals over the past five years. The Environmental Sustainability Advisory Group (ESAG), a leadership team made up of staff, faculty and student representatives, leads and champions VCC's environmental efforts. As part of BC Hydro's Energy Management Program, VCC has created a three-year Strategic Energy Management Plan to reduce energy consumption.

Working together across the college, staff, faculty and students have achieved a number of milestones.





2015 greenhouse gas emissions

In 2015, VCC emitted 2,041 tonnes of carbon dioxide equivalent (tCO2e) from sources covered under the Carbon Neutral Government Regulation (see Figure One). This is a 12% reduction over 2014 levels and a 32% reduction over 2010 levels. Of the total emissions for 2015, 95% come from heating, cooling and lighting our buildings and the remaining 5% come from the use of paper.

It was estimated that stationary fugitive emissions from cooling do not comprise more than 0.01% of VCC's total emissions and to collect data for emissions from this source was not feasible. For this reason, emissions from this source have not been included in VCC's total greenhouse gas emissions profile.



¹VCC owns six diesel trucks, five diesel excavators, three diesel bull dozers, five diesel front end loaders and several diesel engines on stands used for training purposes in the School of Transportation Trades. Emissions from the use of these engines do not comprise more than 0.01% of VCC's total emissions and to collect data for emissions from this source was not feasible. For this reason, emissions from this source have not been included in VCC's total greenhouse gas emissions profile.

¹ 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.



Offsets applied to become carbon neutral in 2015

VCC has purchased 2,041 tonnes of carbon offsets from the Ministry of the Environment at a cost of \$51,025 (\$25 per tonne) plus GST to achieve carbon neutrality, as required by the Greenhouse Gas Reduction Targets Act.

Actions taken to reduce greenhouse gas emissions in 2015

Since 2013, VCC has partnered with BC Hydro in an Energy Manager Program and engaged the services of Prism Engineering to work with the college in developing and implementing a Strategic Energy Management Plan (SEMP). The SEMP supports VCC's commitment to energy efficiency and conservation by providing a framework for reducing energy consumption and its associated environmental impacts. It includes a specific energy reduction target and an action plan of how the target will be achieved.

VCC will reduce campus energy intensity in existing buildings by 20 per cent from 2010/11 fiscal year levels by 2016/17 fiscal year.



In order to better monitor energy usage and utility costs, VCC utilizes Prism's online energy management software program, PUMA to analyze and manage energy consumption and GHG emissions using utility billing data.

Compared to 2010, the results, as of the end of December, 2015, indicate that VCC has reduced energy consumption by 21%. This includes a 14% reduction in electricity usage, a 31% reduction in natural gas usage and a 18% reduction in steam usage.

The following specific projects were undertaken during 2015 to reduce energy use and GHG emissions:

• Downtown campus lighting upgrades phase 2: Phase two of lighting upgrades to the Downtown campus were completed in March, 2016. This project involved new LED lights in the Atrium and throughout level two of the Pender building and will result in annual savings of over 50,000 kWh per year.

• Broadway campus interior lights: Lighting upgrades to interior lights at the Broadway Campus were also completed in March, 2016, saving 195,000 kWh per year. These upgrades included converting higher wattage Compact Fluorescent (CFL) downlights with LED modules in common areas and corridors in both Buildings A and B; converting metal halide lamps in decorative luminaires in Building B to LED modules; and relamping 4' linear fluorescent luminaires in Building B with 25W energy saving T8 lamps.

•Direct Digital Controls (DDC): In 2015, DDCs were installed on 24 existing heat pumps and lighting systems on the second floor of the Downtown campus Dunsmuir Building and the library. At this time, seven occupancy sensors were also installed in this area. Estimated energy savings of 30% will result from these actions.

• Scheduling: In 2015, VCC introduced a new process whereby room bookings for each weekend are reviewed on Friday and HVAC systems are modified over the weekend to match the room bookings. This has significant savings, especially at the Broadway campus. While direct savings are difficult to estimate, natural gas use at the Broadway campus is down 16% over the past year.

• Energy conservation and awareness: Working with the ESAG and the VCC Green Team, VCC produced four green e-newsletters and two success stories highlighting the changes to the parking lot lighting and energy savings from IT (see Appendix). In addition, the Air Handling Units at Broadway were aligned to the room booking schedule to ensure operational efficiency. These actions saved approximately 88,500 kWh in July and August alone.



Plans to continue reducing greenhouse gas emissions 2016 and beyond

Full details on VCC's three-year strategy to reduce energy use can be found in the Strategic Energy Management Plan see http://www.vcc.ca/about/college-information/reports-and-publications/).

To enable VCC to achieve this reduction target, cost-effective energy management initiatives will be undertaken. In addition to energy savings potential, the initiatives taken will be selected based on non-energy benefits, including occupant comfort, equipment reliability, maintenance costs, and operational improvements. The following initiatives are planned for the next three years:

• Downtown campus lighting upgrades phase 3: Capital funds have been requested to complete phase 3 of this project and achieve further electricity savings of 263,000 kWh or an additional 5% at a payback period of 5.9 years. The capital cost of phase 3 is \$280K and would include converting CFL downlights with LED modules in select common areas and relamping incandescent sconces with LED lamps in JJ's Restaurant, and the 4th floor hospitality lobby; installing daylight controls in high fenestration hallways and installing occupancy sensors in all washrooms; and, replacing all exterior compact fluorescent, metal halide and high pressure sodium luminaires with new LED luminaires.

• **Continuous optimization program:** VCC's Broadway campus has been approved to participate in Continuous Optimization, a BC Hydro and Fortis BC program. This will involve the installation of an energy management information system which will allow VCC to conduct a detailed investigation to identify potential control focused projects. Projects with a payback period of less than two years will be actioned by the college.

• DDCs: DDCs have not yet been installed on existing heat pumps and lighting systems in all parts of the Downtown campus. One floor was completed in 2015. We will continue to install DDCs in the remaining sections as budget allows.

• Energy conservation and awareness: Building on our successful "Lights Out" campaign" and "Random Acts of Green" campaign, VCC will continue to work to engage staff, students and faculty through campaigns to support behaviour change across both campuses. The annual savings from changing behaviour is estimated at 2% per year.

Actions to reduce provincial emissions and improve sustainability

VCC recognizes the role it plays in working to reduce provincial greenhouse gas emissions and improve sustainability. In April 2014, VCC released its Environmental Sustainability Strategy for 2014/15 to 2016/17

VCC will strive to bring its long-term environmental sustainability vision to life over the next ten years. By 2023, our approach to environmental sustainability will be a key reason we are an educational institution of choice. Over ten years we will advance towards zero - and in some cases restorative - environmental impact. We will be a green community hub, catalyst and partner. Our students will graduate with the competencies, connections, and inspiration to play a leadership role in the region's transformation to sustainability. We have organized our three year strategy into three themes of lead, live and learn, and set ten objectives for ourselves to achieve by 2016/17.

For more information on VCC's Environmental Sustainability Plan, check out our website at

vcc.ca



Appendix



Dark, rainy nights in Vancouver mean a well-lit parking lot is essential. But, lighting these large spaces can be expensive. This winter, students, staff, and faculty are enjoying a brighter, safer and more energy efficient campus. A major lighting upgrade was completed in March, 2015 at VCC's Broadway Campus and the savings are already rolling in. The exterior lighting overhaul translates into 68,000 kWh in annual savings or roughly the amount needed to power all 2,000 computers on campus for 56 days.





After: New LED luminaires offer better optical performance and light distribution

Safety

In the Broadway Campus parking lot, increased light levels and lighting consistency were provided ensuring greater safety for staff and students walking to and from vehicles and crossing the parking lot to the VCC-Clark Skytrain Station. The parking lot was poorly served by the old system, which used a mixture of high pressure sodium (HPS) lamps and metal halide (MH) lamps. Using both HPS lamps, which give off a warmer "yellow" light, and MH lamps, which give off a cooler "white" light, in the same area resulted in a lack of uniformity and visual appearance. Additionally the older MH lamps floodlights were failing often, resulting in large dark patches spotting the parking lot.

Most of the exterior building lights were suffering from the same issue. Dark patches around the exterior of the building were concerning for campus safety. Increasing light levels enhanced safety and security for students, staff, and faculty moving between buildings during the dark winter months.

Appendix - cont -



VCC's IT team is saving energy one PC at a time

VCC has an energy-aware IT team that conserves energy using computer and monitor power-save modes

Computers: the silent consumers

We sometimes forget that our computers use energy. Hiding under our desks and quietly calculating, VCC's computers and monitors emit over four tonnes of greenhouse gases (GHGs) into our atmosphere each year from the electricity they use. That means VCC's approximately 2,000 computers at the Downtown and Broadway campuses emit the same GHGs as burning 9.5 barrels of oil or burning 4,400 pounds of coal.

How IT is saving energy

All of VCC's computers have different settings that draw different amounts of power. While switched "on," a computer and monitor together draw 115 Watts, while in "sleep" or "suspended" mode, the power draw drops to seven watts, and when "off," both devices use next to no power. Thanks to the work of our diligent IT team, all of VCC's computers and monitors have an automated sleep and

Since IT began managing computer and monitor power settings in 2010, VCC has saved:

- 2,111,165 kWh of electricity (or 133 homes' annual usage)
- 1,502,281 kg of CO2 (or what 5 square km of forests sequester in a year)
- \$126,660 (or the cost of 230 brand new PCs)



VCC's IT Team in March

shut down time tailored to the way the computer is used. For example, office monitors are turned off after 20 minutes of inactivity during work hours, and 10 minutes of inactivity during evenings and weekends. Student computer settings keep in mind patterns of use for students, and the fact that students often study on campus during the weekends.

What's more?

The IT team continues to work with facilities and VCC's energy manager, Prism Engineering's Majid Pishavei, to take savings even further, with the goal to tune computer settings as close to actual usage as possible.

Created with support from BC Hydro's Energy Manager program



Savings calculations & case study prepared by:



saving you energy



Total Emissions: 2,041

Stationary Fuel Combustion (Building Heating and Generators) and Electricity Supplies (Paper)

Offsets Applied to Become Carbon Neutral in 2015 (Generated May 26, 2016 9:22 AM)

Total offsets required: 2,041. Total offset investment: \$51,025. Emissions which do not require offsets: 0 **

*Tonnes of carbon dioxide equivalent (tCO_2e) 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.

2015 Carbon Neutral Action Report Survey

Organization Name:

Vancouver Community College

Please select your sector:

• Post-Secondary Institution

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

Please indicate which actions your PSO took in 2015:

Have developed an overall strategy/plan to reduce energy use in your organization's buildings inventory:

Yes

If Yes, please describe:

VCC has developed at Strategic Energy Management Plan to reduce energy use in our buildings. You can read our SEMP at http://www.vcc.ca/about/college-information/reports-and-publications/

Undertook evaluations of building energy use:

Yes

Performed energy retrofits on existing buildings:

Yes

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

No

Please list any other actions, programs or initiatives that your organization has introduced that support emissions reductions from buildings:

Initiated Continuous Optimization Program with BC Hydro and Fortis BC. Currently monitoring baseline data for our Downtown Campus.

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

Indicate which actions your PSO took in 2015:

Have put in place an operations policy/program to support systematic reductions in fleet related emissions:

(e.g., program to convert fleet to renewable fuels)

No

If Yes, please describe:

(No response)

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

No

Replaced existing vehicles with hybrid or electric vehicles:

No

Took steps to drive less than previous years:

No

Please list any other actions, programs or initiatives that your organization has introduced that support emissions reductions from fleet combustion:

Not applicable. VCC does not operate a vehicle fleet.

3) Supplies (Paper):

Indicate which actions your PSO took in 2015:

Have put in place an operations policy/program to facilitate a systematic reduction in paper-related emissions:

(e.g., policy to purchase 100% Recycled Content; default to double-sided printing)

Yes

If yes, please describe:

In 2015, emissions from paper use at VCC are10% less than in 2014 and 46% less than 2010. VCC uses 30% recycled paper and all printers are set to double-side as a default. All printers have stickers on them to remind users to save paper.

Have put in place an operations policy/program to facilitate behavioural changes from paper use:

(e.g. awareness campaign to reduce paper use):

No

If yes, please describe:

(No response)

Used only 100% recycled paper:

No

Used some recycled paper:

Yes

Used alternate source paper:

(e.g., bamboo, hemp, wheat etc.)

No

Please list any other actions, programs or initiatives that your organization has introduced that support emissions reductions from paper supplies:

(No response)

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No

No

No

4) Other Sustainability Actions: Please note that this section is optional **Business Travel** Created a low-carbon travel policy or travel reduction goal: (low-carbon = lowest emission of greenhouse gas per kilometer per passenger) Encouraged alternative travel for business: (e.g. bicycles, public transit, walking) Encouraged or allow telework/working from home: Other: (No response) **Education Awareness**

Have a Green/Sustainability/Climate Action Team:

Yes

Supported green professional development:

(e.g. workshops, conferences, training)

No

Supported or provided education to staff about the science of climate change, conservation of water, energy and/or raw materials:

Yes

Other:

(No response)

Adaptation Planning for Climate Risks

Have assessed whether increased frequency of extreme weather events and/or long term changes in climate will affect your organization's infrastructure, its employees and/or its clients:

No

Have incorporated these anticipated changes in climate into your organization's planning and decision making:

No

Other:

(No response)

Other Sustainability Actions

Established a water conservation strategy which includes a plan or policy for replacing water fixtures with efficient models:

No

Have put in place an operations policy/program to facilitate the reduction and diversion of building occupant waste stream from landfills or incineration facilities:

(e.g., composting, collection of plastics, batteries)

Yes

Established green standards for goods that are replaced infrequently and/or may require capital funds to purchase:

(e.g., office furniture, carpeting, etc.)

Yes

Incorporated lifecycle costing into new construction or renovations:

No

Please list any other sustainability actions your organization has taken not listed above:

(No response)