UBC sustainability

2013 Carbon Neutral Action Report

The University of British Columbia

May 30 2014

a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA

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Executive Summary

As a rapidly growing, research-intensive institution, the University of British Columbia (UBC) is faced with the challenge of meeting increasing demand for energy while reducing greenhouse gas (GHG) emissions and effectively managing the need for energy. Our efforts focus on both energy conservation and improvements in energy efficiency, driven by the need to manage operational costs and the urgent need to mitigate the effects of energy consumption on climate change.

In 2013, UBC continued to deliver on our climate action commitments, reducing offsettable greenhouse gas (GHG) emissions by 11 per cent against a 2007 baseline, despite a 16 per cent increase in floor space and a 22 per cent increase in student enrollment; relative to student enrolment, we have reduced GHG emissions per full-time equivalent student by 27 per cent compared to 2007 levels.

As the majority of our emissions come from buildings, our climate performance has been largely achieved through optimizing our district energy systems (through integrating renewables and increasing energy efficiency), re-commissioning existing buildings, designing and constructing new green buildings and delivering behaviour change programs focused on energy conservation.

UBC's Vancouver campus key achievements include the first full year of thermal operation of our Bioenergy Research and Demonstration Facility, completing nearly half of our Academic District Energy System steam to hot water conversion project, and continuing to roll out our Continuous Optimization program to re-commission all major buildings on campus, in partnership with BC Hydro. The Centre for Interactive Research on Sustainability (CIRS), achieved UBC's first LEED Platinum certification, and the Chemistry Renew and Biological Sciences Renew projects were certified LEED Gold. We completed a Campus Sustainability Engagement Strategy that refreshes our behaviour change programs, aimed at reducing energy, water and waste in student residences, labs and offices and began work on a 20 year sustainability strategy to set a long-range vision for sustainability at UBC.

At UBC's Okanagan campus, key achievements include the completion and continued optimization of our geo-exchange district energy system (DES), which distributes aquifer ground-sourced heating and cooling and allows for energy sharing between buildings. Connected to the DES, our innovative new Fitness and Wellness Centre opened in 2013. Built to LEED Gold standard, the facility incorporates carbon capturing/storing properties of locally sourced and produced pine beetle timber. With a focus on reducing energy in legacy buildings, we launched the Building Optimization program in partnership with Fortis BC, to provide technical retrofits and controls changes. We also rolled out the Power of You energy conservation and awareness strategy, which complements building optimization by actively engaging building occupants in voluntary actions to reduce energy use.

We are pleased to share key highlights of our climate action initiatives implemented in 2013.

Michael White
Associate Vice-President
Campus and Community Planning
The University of British Columbia

Michael Shakespeare
Associate Vice-President
Finance and Operations
The University of British Columbia – Okanagan Campus

Emissions Overview

Photo credit: UBC

This is the 2013 Carbon Neutral Action Report (CNAR) for The University of British Columbia. This report contains our 2013 greenhouse gas (GHG) emissions profile, offsets purchased, actions taken in 2013 to reduce emissions and our plans to continue reducing emissions in 2014 and beyond.

Following the Emissions Overview, a detailed implementation report for each campus provides additional information on emissions and actions taken to reduce emissions at each campus.

About UBC

The University of British Columbia (UBC) is a global centre for research and teaching, consistently ranked among the top 40 universities in the world. Our two main campuses — the Vancouver campus and the Okanagan campus — attract and educate more than 58,000 students from 140 countries and employ over 15,000 staff and faculty. UBC Vancouver is home to a vibrant, sustainable residential community, where some 20,000 students, faculty, staff and other residents live, work and learn together, and 1,700 students live at the Okanagan campus.

Sustainability Plans and Publications

UBC's Vancouver campus sustainability plans and reports, including annual GHG Inventories, Carbon Neutral Action Reports, and Annual Sustainability Reports are available at http://sustain.ubc.ca/our-commitment/plans-policies-reports. UBC's Okanagan campus Carbon Neutral Action Reports and SHIFT Sustainability Reports are available at http://www.ubc.ca/okanagan/sustainability/reports.html.

Emissions and Offsets Summary

2013 Emissions

Under the Greenhouse Gas Reductions Target Act, UBC has been required to report and offset its emissions since 2010, including emissions from all properties owned and leased by UBC and its subsidiaries. *Table 1* shows UBC's total GHG emissions and offsets purchased in addition to any adjustments made and credits owed to the Pacific Carbon Trust (PCT).

Table 1: 2013 Total UBC Emissions and Offsets Summary

	UBC Vancouver[1]	UBC Okanagan	UBC Total
GHG Emissions Created in Calendar Year 2013 (tCO_2e)			
Total Emissions	71,289	3,630	74,919
Total Emissions for Offsets	56,801	3,629	60,430
Adjustments to GHG Emissions Reported in Previous Years (tCO_2e)			
Total Emissions	-1,995[2]	0	-1,995
Total Emissions for Offsets	-19	0	-19
Credit Owing From PCT at End of 2012 Reporting Year (tCO_2e)			
Current 2013 Balance with the PCT	4	0	4
Total Emissions for Offsets for the 2013 Reporting Year	56,778	3,629	60,407

[1] *Including UBC Properties Trust and off-campus properties.*
[2] *Adjustments made in the 2013 reporting period to 2011 and 2012 emissions corrected an error in SMARTTool in which UBC over-reported emissions. The corrections were primarily to biomass emissions which are not required to be offset.*

Table 2 shows the 2013 offsettable emissions for UBC's two main campuses along with key performance indicators.

Table 2: 2013 Offsettable Emissions for UBC's Vancouver and Okanagan Campuses

Key Performance Indicator	Vancouver Campus[1]	Okanagan Campus
GHG Emissions (tonnes CO_2e)	52,832	3,629
Floor Space (square meters)	1,431,593	136,373
Staff and Faculty Employees (FTE)	13,387	1,048
Student Enrolment (FTE)	43,650	7,402
GHG Emissions per Student (tonnes CO_2e/FTE)	1.21	0.49

[1] *Excluding UBC Properties Trust and off-campus properties*

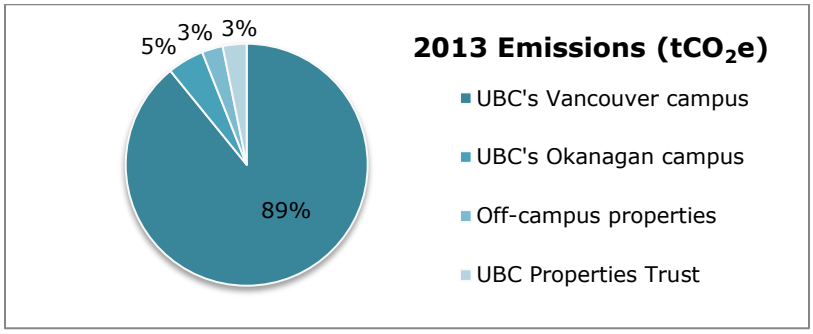
A summary of the emissions attributed to different off-campus units of UBC is provided in *Table 3* and *Figure 1*. When emissions from off-campus properties are included, total offsettable emissions amounted to 60,430 tCO_2e in 2013. Biomass CO_2 emissions, amounting to 14,489 tonnes, are reported but are not required to be offset. Including biomass emissions, total emissions for UBC were 74,919 tonnes in 2013.

Table 3: UBC Total 2013 Emissions

Location	2013 emissions (tCO_2e)
UBC's Vancouver campus	52,832
UBC's Okanagan campus	3,629
Off-campus properties	1,780
UBC Properties Trust	2,188
Total offsettable emissions	**60,430**
Biomass CO_2 emissions	14,489[1]
Total emissions including biomass	**74,919**

[1] *Biomass emissions, considered carbon neutral, are from a renewable energy source and are not required to be offset.*

Figure 1: UBC 2013 Offsettable Emissions by Location



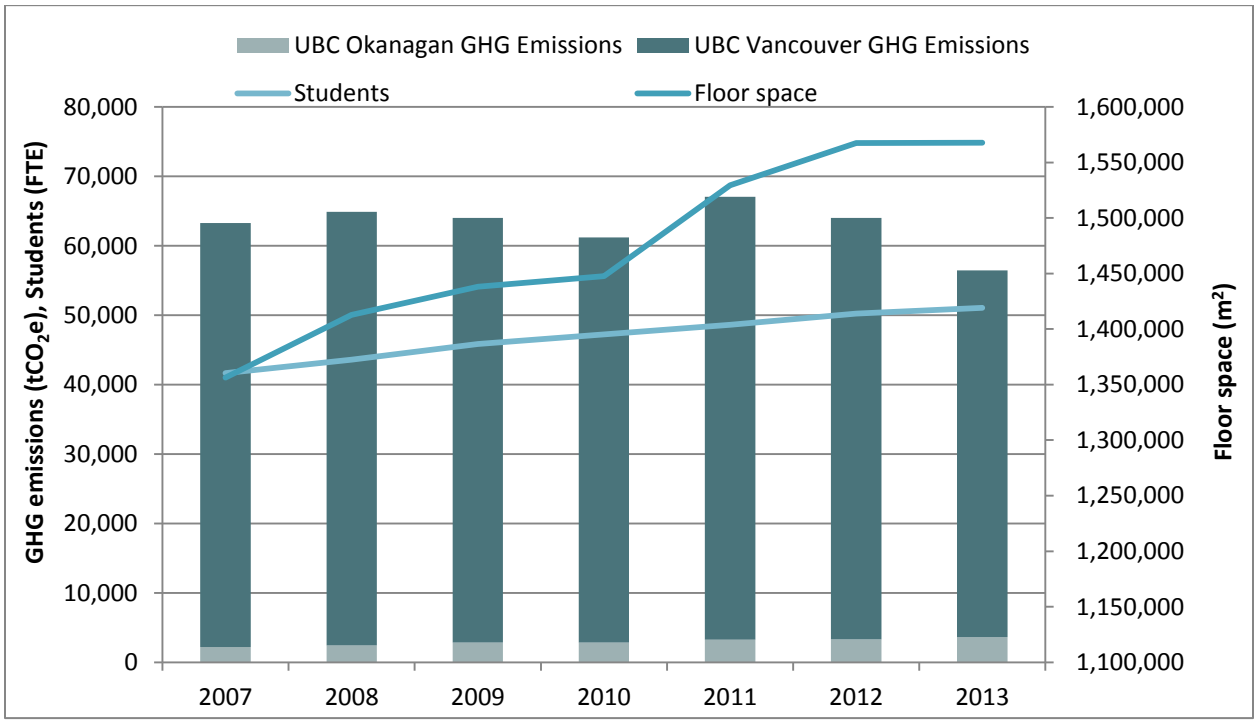
Comparison to 2007 Baseline

UBC tracks and reports our absolute and relative emissions for each campus against a 2007 baseline to measure and demonstrate performance against our Climate Action Plan targets. Despite significant campus growth in floor space and student enrolment, UBC has maintained a decrease in emissions per capita, as shown in *Figure 2*.

In 2013, UBC continued to deliver on our climate action commitments, reducing offsettable greenhouse gas (GHG) emissions by 11 per cent against a 2007 baseline, despite a 16 per cent increase in floor space and 22 per cent increase in student enrollment; relative to student enrollment, we have reduced GHG emissions per full-time equivalent (FTE) student by 27 per cent.

Figure 2 outlines the change in offsettable emissions for the Vancouver and Okanagan campuses since the 2007 baseline year, along with indicators of UBC campus growth. Student enrolment increased by over 9,000 FTE students from 2007 to 2013 while floor space increased by over 211,000 square metres.

Figure 2: UBC Offsettable Emissions and Growth, 2007 to 2013



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Executive Summary

UBC's Vancouver campus made significant progress this past year towards achieving the Vancouver Campus Climate Action Plan's aggressive greenhouse gas (GHG) reduction targets of 33 per cent below 2007 levels by 2015. In 2013, UBC's Vancouver Campus offsettable emissions decreased 14 per cent from 2007 levels, despite an 11 per cent increase in building floor space and a 16 per cent increase in student enrolment. Per capita, we have reduced emissions 26 per cent per full-time equivalent student since 2007. Key achievements made towards implementing the three core projects of our Climate Action Plan include:

- UBC's Bioenergy Research and Demonstration Facility, a pioneering campus as a living lab project, completed the first full year of operation, generating clean thermal energy from renewable biomass to produce 14 per cent of total campus steam production, significantly reducing natural gas use on campus and eliminating 9 per cent of campus GHG emissions compared to 2007 levels.

- Nearly half of the five-year Academic District Energy System steam to hot water conversion project is now complete, including design of the new District Energy Centre, which will replace the campus' aging steam plant. When complete, the $88 million project will connect 130 buildings to the more efficient hot water district energy system, reducing emissions by 22 per cent and saving $5.5 million a year in operational costs.

- The Continuous Optimization "Building Tune-Up" program is retro-commissioning over 70 buildings, targeted to reduce emissions in core buildings by 10 per cent combined with behaviour change programs. Implementation was completed in 17 laboratory buildings, another 24 buildings will commence implementation in 2014, and a further 27 additional buildings are currently being investigated.

Complementing the Climate Action Plan, in 2013 we completed a Community Energy and Emissions Plan for UBC's residential neighborhoods in collaboration with the University Neighborhoods Association. We also completed a full feasibility study on a Neighborhood District Energy System, which will provide low-carbon thermal energy for UBC residential neighbourhoods. And we continue to build high performance buildings on campus; in 2013 The Centre for Interactive Research on Sustainability achieved UBC's first LEED Platinum certification, and the Chemistry Renew and Biological Sciences Renew projects were certified LEED Gold.

To further embed sustainability across campus, we began development of our Operational Sustainability Strategy, which involves working with key operational departments and helping them identify their own strategic sustainability objectives and actions that will help UBC achieve the long-term campus-wide targets in energy, climate, waste and water. We also began work on developing a 20 Year Sustainability Strategy to provide a long-term direction for operational and academic sustainability for the Vancouver Campus.

In addition to large scale infrastructure changes, we continue to engage our campus community to reduce emissions. In 2013, we completed a Campus Sustainability Engagement Strategy that refreshes the campus' engagement program priorities aimed at reducing energy, water and waste in student residences, labs and offices through behaviour change programming. Highlight engagement achievements include the fourth annual Aim to Sustain competition, a three week energy conservation competition in two main student residences, and the third annual Shut the Sash energy conservation competition engaging researchers to save energy in labs. UBC is also working to expand the Green Labs Program and Sustainability Coordinator program to further reduce the environmental impact of our research laboratories.

We are pleased to share with you some of the highlights of our climate action initiatives that were implemented in 2013.

Michael White
Associate Vice-President
Campus and Community Planning
The University of British Columbia

Climate Action at UBC Vancouver

Overview and History

In 2010, UBC announced our Vancouver Campus Climate Action Plan, committing to aggressive reduction targets for greenhouse gas (GHG) emissions – 33 per cent reduction by 2015, 67 per cent by 2020, and 100 percent reduction by 2050, compared to 2007 levels. UBC is investing $117 million in three major projects that will achieve our target of reducing GHG emissions by 33 per cent by 2015:

- Converting the Academic District Energy System from steam to hot water will reduce emissions by 22 per cent.
- Optimizing academic building performance and improving behaviour change programs through the Building Tune-Up program will reduce emissions in core buildings by 10 per cent.
- Generating clean heat and electricity through the Bioenergy Research and Demonstration Facility will reduce emissions by 9 per cent.

To track progress towards achieving our GHG targets, UBC produces an annual Carbon Neutral Action Report which includes a detailed analysis and discussion of our GHG Inventory. In 2013, UBC and the University Neighborhoods Association (UNA) completed a Community Energy and Emissions Plan that identifies actions to reduce emissions from UBC's residential community.

UBC's Energy Management Plan is designed to maintain energy savings and identify further electricity and natural gas conservation opportunities and efficiencies. This plan reviews the current status of energy use and operating costs, sets targets, assesses opportunities, and identifies priority energy conservation initiatives.

For more information about climate action at UBC, read the award-winning AASHE Case Study on Implementing UBC's Climate Action Plan. For additional details on UBC's sustainability plans, initiatives, and other performance reports, please visit the Plans and Reports section of our website and refer to our full UBC Annual Sustainability Report.

2013 Greenhouse Gas Emissions

UBC's Vancouver campus educates nearly 50,000 students, employs over 14,000 staff and faculty, and is home to a campus residential population of some 20,000 students, staff, faculty and other residents who live, work and learn on campus. With an institutional footprint of 402 hectares, UBC's Vancouver campus is home to 329 institutional buildings owned by UBC, totalling 1.4 million square metres (15.4 million square feet).

In 2013, total offsettable GHG emissions for UBC's Vancouver campus amounted to 52,832 tonnes CO_2e. Since 97 per cent of these emissions come from Vancouver campus buildings, with 75 per cent of the total occurring at the campus steam plant, key actions focus on optimizing our district energy systems (through integrating renewables and increasing energy efficiency), re-commissioning existing buildings, designing and constructing new green buildings and delivering behaviour change programs focused on energy conservation.

It was estimated that fugitive emissions of refrigerant gases comprise less than one per cent of UBC's Vancouver campus total emissions and collecting data to estimate these emissions would be disproportionately onerous. For this reason, emissions from this source have been deemed out of scope and have not been included in UBC's Vancouver campus GHG emissions profile.

Emissions in Greater Detail

The Climate Action Plan GHG reduction targets apply to emissions from core and ancillary buildings, TRIUMF, fleet and paper. The UBC Vancouver Campus GHG Inventory, which comprises these elements, has been compiled each year since 2006. In 2013, the offsettable Vancouver Campus emissions amounted to 52,832 tCO_2e. A detailed breakdown of the campus emission sources is provided in *Table 1*.

Table 1: UBC's Vancouver Campus Offsettable Emissions, 2013

Source	2007 emissions (tCO_2e) [1]	2013 emissions (tCO_2e) [1]	Per cent of 2013 campus emissions[1]
UBC Vancouver Campus – Core buildings[2]	**46,478**	**38,847**	**74%**
Steam (natural gas and light fuel oil)	*40,106*	32,326	61%
Natural gas (direct burn)	*3,515*	3,691	7%
Electricity	*2,856*	2,388	5%
Biomass facility[3]	*N/A*	442	0.8%
UBC Vancouver Campus – Ancillary buildings[4]	**11,405**	**12,143**	**23%**
Steam (natural gas and light fuel oil)	*7,311*	7,403	14%

Source	2007 emissions (tCO_2e) [1]	2013 emissions (tCO_2e) [1]	Per cent of 2013 campus emissions[1]
Natural gas (direct burn)	*3,108*	3,923	7%
Electricity	*986*	721	1%
Biomass facility[3]	*N/A*	96	0.2%
TRIUMF[5]	**222**	**143**	**0.3%**
Fleet	**1,973**	**1,216**	**2.3%**
Paper	**1,003**	**483**	**0.9%**
Total Vancouver Campus Offsettable Emissions	**61,082**	**52,832**	**100%**

[1] *May not sum to total due to rounding.*
[2] *Core buildings comprise academic and administrative buildings.*
[3] *UBC is required to offset the CH_4 and N_2O portions of biomass combustion. In addition, the Bioenergy Research and Demonstration Facility (BRDF) burns a small amount of natural gas. The BRDF began operating in 2012.*
[4] *Ancillary buildings include student housing, conference, athletics and parking facilities.*
[5] *Although TRIUMF is a joint venture with other universities, it has traditionally been included in the UBC Vancouver Campus inventory since it is located on campus. UBC is responsible for 1/11th of emissions.*

Under the Greenhouse Gas Reductions Target Act, UBC has been required to report and offset its emissions since 2010, including emissions from all properties owned and leased by UBC and its subsidiaries. A summary of the emissions attributed to different off-campus units of UBC is provided in *Table 2*.

Table 2: Off-Campus Property Offsettable Emissions, 2013

Source	2013 emissions (tCO_2e) [1]
UBC Properties Trust – Owned Buildings[1]	**2,186**
UBC Robson Square Campus	**199**
Other Off-Campus Properties[2]	**1,333**
Joint Ventures with other universities[3]	**248**
Great Northern Way Campus	229
Bamfield Marine Sciences Centre	19
UBC Properties Trust – Paper	**2**
Total Off-Campus Property Emissions	**3,969**

[1] *UBC Properties Trust, a company wholly owned by UBC, owns several residential buildings that are rented to staff, faculty and students, as well as space leased to retail and commercial tenants on campus.*
[2] *Other off-campus properties include 6 owned buildings and 11 leased spaces throughout the province.*
[3] *Although TRIUMF is a joint venture with other universities, it has traditionally been included in the UBC Vancouver Campus inventory and is thus not included in this table.*

Going beyond provincial requirements, the annual UBC Vancouver Campus GHG Inventory also quantifies several categories of optional or Scope 3 emissions (*Table 3*). These emissions are not required to be offset. UBC's Climate Action Plan includes strategies for reducing Scope 3 emissions related to commuting, business travel, procurement and food.

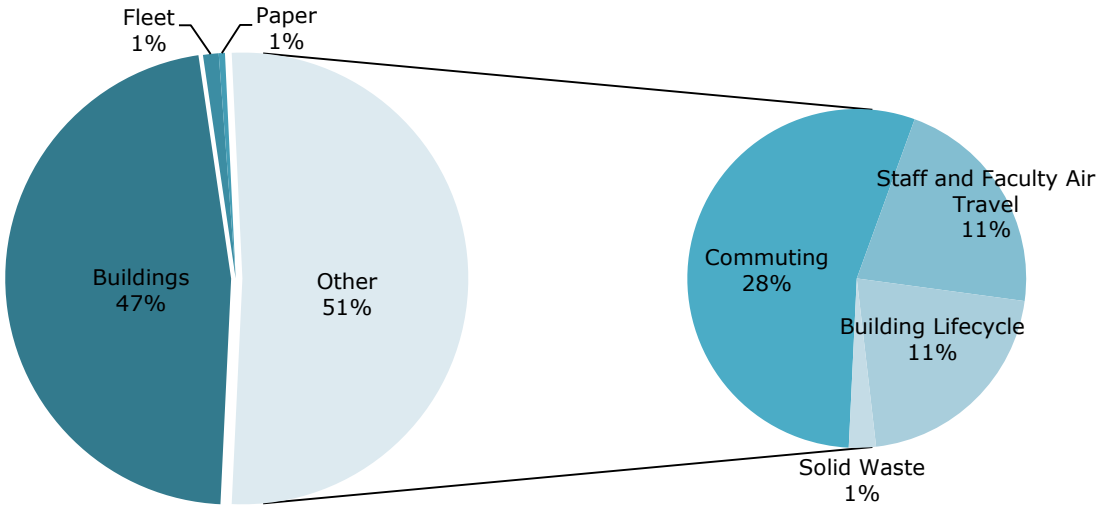
Table 3: UBC's Vancouver Campus Scope 3 Emissions, 2013

Source	2007 emissions (tCO_2e)	2013 emissions (tCO_2e)
Commuting	**28,880**	**30,757**[1]
Staff and Faculty Air Travel	**13,600**[2]	**12,110**[3]
Building Lifecycle	**10,190**	**11,811**
Solid Waste	**1,930**	**1,448**[4]

[1] *Data for 2013 unavailable at time of publication; the value from 2012 is provided.*
[2] *Not calculated in 2007; the value from 2006 is provided.*
[3] *Emission factors for air travel changed in 2013 resulting in significantly reduced emissions.*
[4] *Data for 2013 unavailable at time of publication; the value from 2012 is provided.*

The combined emissions from commuting, business travel, building lifecycle and solid waste (*Table 3*) were approximately equal to the offsettable Vancouver Campus emissions (*Table 1*) in 2013. *Figure 1* shows the relative proportions of the various emission categories for the UBC Vancouver campus.

Figure 1: UBC's Vancouver Campus Emissions by Scope, 2013



Comparison to Baseline Year

Scope 1 and 2 Emissions

UBC's Vancouver Campus offsettable emissions decreased 14 per cent from 2007 to 2013, despite an 11 per cent increase in building floor space and a 16 per cent increase in student enrolment. The emissions from campus buildings along with fleet and paper amounted to 1.21 tCO_2e per full-time equivalent student in 2013, a 26 per cent decrease in emissions per student since 2007.

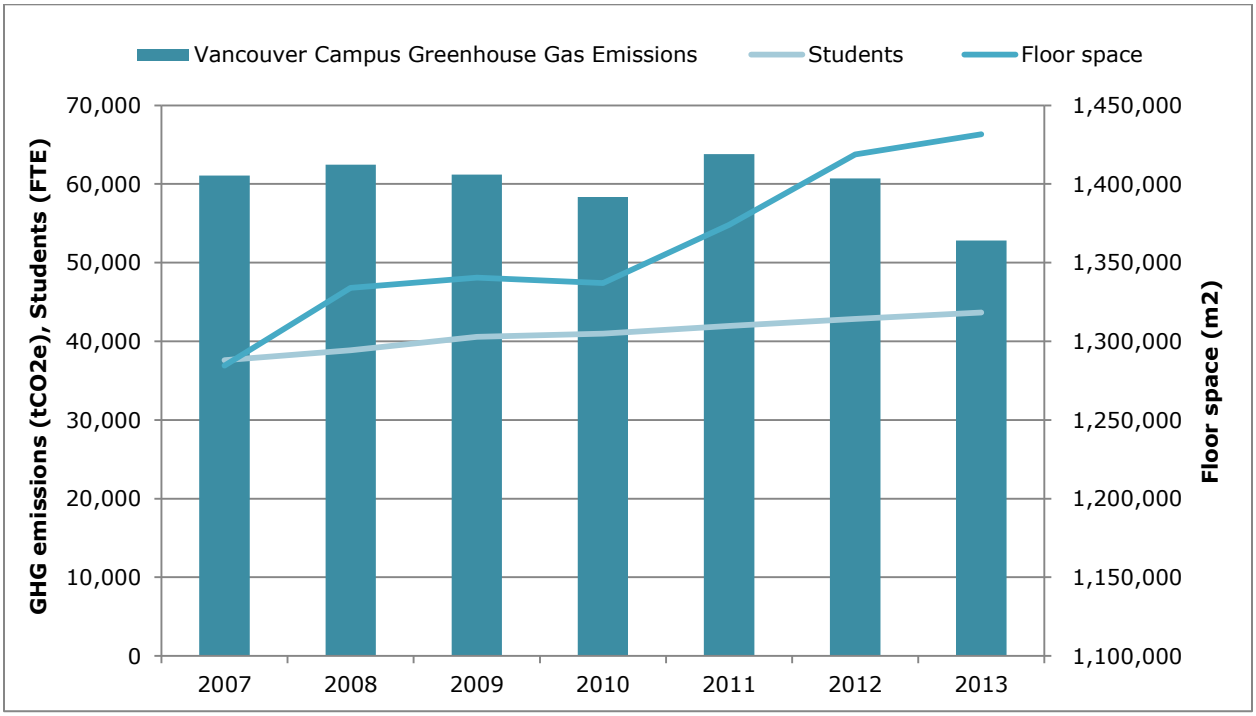
UBC's Vancouver Campus building floor space increased by over 147,000 square metres between 2007 and 2013, with several older buildings demolished to make way for construction of new buildings. Notable new buildings that opened in 2013 include Phase 1 of Ponderosa Commons, which added an additional 600 student beds on campus, and the Centre for Brain Health, a state-of-the-art research, clinical, and teaching facility, both targeting LEED Gold certification.

Table 4 and *Figure 2* outline the change in campus emissions since the 2007 baseline year, along with indicators of UBC Vancouver campus growth. Student enrolment increased by over 6,000 full-time equivalent (FTE) students from 2007 to 2013 while faculty and staff increased by over 900 employees.

Table 4: UBC's Vancouver Campus Offsettable Emissions Compared to 2007 Baseline

Key Performance Indicator	2007	2013	Change from 2007 to 2013
GHG Emissions (tonnes CO_2e)	61,082	52,832	-14%
Staff and Faculty Employees (FTE)	12,461	13,387	+7%
Student Enrolment (FTE)	37,589	43,650	+16%
GHG Emissions per Student (tonnes CO_2e/FTE)	1.62	1.21	-26%
Floor Space (square meters)	1,284,462	1,431,593	+11%
GHG Emissions per square meter (tonnes CO2e/m^2)	0.048	0.037	-22%

Figure 2: UBC's Vancouver Campus Offsettable Emissions and Growth, 2007 to 2013



Scope 3 Emissions

UBC's Vancouver Campus Scope 3 emissions (*Table 3*) can also be evaluated in the context of indicators of growth in population and floorspace (*Table 4* and *Figure 2*). While total commuting emissions increased from 2007 to 2013, student, staff and faculty population increased at a greater rate, resulting in a 6.6 per cent decrease in commuting emissions per capita. This decrease is primarily due to a shift in mode share: trips by single-occupancy vehicles and carpools decreased while trips by transit increased from 2007 to 2013.

Air travel emissions are affected by changes in employee population and travel patterns. The current focus is on developing a more accurate methodology for tracking the associated emissions[1].

Building lifecycle emissions are proportional to campus floorspace, which increased from 2007 to 2013. Solid waste emissions decreased from 2007 to 2013 despite the increase in campus population during that time. The total amount of waste diverted from the landfill increased over that period, resulting in a 67 per cent overall diversion rate in 2012.

UBC's Climate Action Plan includes strategies for reducing Scope 3 emissions related to commuting, business travel, procurement and food. For additional details on targets, performance and actions, please refer to the full UBC Annual Sustainability Report.

Offsets Applied to Become Carbon Neutral in 2013

As required by provincial regulation, UBC purchased a total of 56,801 tonnes of offsets from the Pacific Carbon Trust for UBC's Vancouver Campus and off-campus properties to become carbon neutral for 2013 (see *Table 5*).

A portion of the vehicle fuel consumed by UBC contains renewable content, as mandated by BC's Renewable and Low Carbon Fuel Requirements Regulation. In addition, CO_2 emissions from biomass at the Bioenergy Research and Demonstration Facility are considered carbon neutral. These emissions, reported as biomass in SMARTTool, amounted to 14,488 tonnes CO_2e and are not required to be offset. Including biomass emissions, total emissions for the UBC Vancouver Campus and off-campus properties amount to 71,289 tonnes CO_2e in 2012 (see *Table 5*).

[1] Calculations for air travel emissions are currently approximate as only 30 to 40 per cent of flights are booked through agencies that can track mileage for UBC. The emissions associated with tracked flights are pro-rated by total expenditure on flights to include an estimate of emissions associated with flights booked personally.

Table 5: Total 2013 Emissions for UBC's Vancouver campus and off-campus properties

Location	2013 emissions (tCO_2e)
UBC's Vancouver campus	52,832
Off-campus properties	3,969
Total offsettable emissions	**56,801**
Biomass CO_2 emissions	14,488
Total emissions including biomass	**71,289**

Changes to Previous Emissions and Offsets Reporting

Several corrections were made to 2011 and 2012 emissions reporting. The corrected emissions for the combined UBC's Vancouver Campus and off-campus properties are summarized in *Table 6* below. UBC over-reported in 2011 and under-reported in 2012 and this year received an additional 19 tonnes of offsets credit to continue to be carbon neutral for 2011 and 2012.

Table 6: Corrections to 2011 and 2012 Emissions

Category	Reported Emissions (tCO_2e)	Corrected Emissions (tCO_2e)	Additional offsets purchased (tCO_2e)
Total 2011 offsettable emissions	67,796[1]	67,767	-29
Total 2011 emissions including biomass	67,842[1]	67,813	
Total 2012 offsettable emissions	64,799	64,809	10
Total 2012 emissions including biomass	68,794	66,828	
Total Additional Offsets Purchased			**-19**

[1] *After applying a correction and purchasing additional offsets in the 2012 reporting year.*

Actions to Reduce Emissions

In 2013, UBC made significant progress on implementing the three core projects of our Vancouver Campus Climate Action Plan, which will together achieve our aggressive GHG reduction targets of 33 per cent reduction in emissions by 2015 compared to 2007 levels:

- **Tuning up our existing buildings to optimize performance:** We are continuing to implement our "Building Tune Up" program to conserve energy and increase efficiency in over 70 major buildings across campus. In 2013, implementation was completed for 17 energy-intensive laboratory buildings in Phase 1, including completion of over 100 Energy Conservation Measures. Another 24 buildings will commence implementation in 2014, followed by a further 27 buildings that are currently being investigated. Overall, the program is targeted to reduce emissions in core buildings by 10 per cent in combination with behavior change programs.

- **Investing in low carbon, renewable and alternative energy sources:** UBC's Bioenergy Research and Demonstration Facility, a pioneering campus as a living lab project, completed the first full year of operation, generating clean heat and electricity from renewable biomass. In 2013, the facility converted 8,600 tonnes of renewable biomass (wood waste) to produce 14 per cent of total campus steam production, significantly reducing natural gas use on campus and eliminating 9 per cent of campus GHG emissions compared to 2007 levels. To further optimize the facility, UBC is undertaking a project that will allow dual fuel supply to the engine, using either Syngas or Renewable Natural Gas (RNG). When fully operational, the cogeneration engine is expected to provide 6 per cent of UBC's annual electricity consumption and reduce UBC's electrical demand by 2 megawatts. The facility has also provided faculty, staff, students and private sector partners the opportunity to study, test, teach and apply lessons learned at the facility.

- **Investing in innovative and efficient energy generation and distribution projects:** Nearly half of the five-year Academic District Energy System steam to hot water conversion project is now complete, including design of the new 60 megawatt thermal District Energy Centre, which will replace the campus' aging steam boiler plant in 2015. Construction began on Phase 5, which will connect an additional 25 buildings (117,000 square metres) to the district energy system in Fall 2014. When complete, the $88 million project will replace 14 km of aging steam system piping infrastructure and connect a total of 130 buildings (800,000 square metres of building floor space) to the more efficient district energy system, reducing emissions by 22 per cent and saving $5.5 million a year in operational costs.

For a full report on UBC's sustainability and climate action plans, initiatives and 2013 performance, please refer to our comprehensive Annual Sustainability Reports, available online.

2013 Carbon Neutral Action Report (CNAR) - Part 2 ACTIONS SURVEY

Organization Name

University of British Columbia – Vancouver Campus

Actions Taken to Reduce Emissions

1) Stationary Fuel Combustion, Electricity (Buildings): Indicate which actions were taken in 2013:

Survey Question	Response
Performed energy retrofits on existing buildings	Yes
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:

The Continuous Optimization "Building Tune-Up" program is retro-commissioning over 70 buildings, targeted to reduce emissions in core buildings by 10 per cent combined with behaviour change programs. Implementation was completed in 17 laboratory buildings in 2013, another 24 buildings will commence implementation in 2014, and a further 27 additional buildings are currently being investigated.

As of 2012/13 FY, UBC had 18 total LEED* registered and certified projects and 25 total REAP** registered and certified projects, for a total of 43 green building projects on campus.

*All new construction and major renovations for institutional buildings at UBC must achieve a minimum of LEED Gold certification.

**UBC's Residential Environmental Assessment Program (REAP) is a comprehensive, UBC-specific green building rating system for mandatory application to all residential construction on campus. All new residential buildings at UBC must achieve a minimum of REAP Gold certification.

2) Mobile Fleet Combustion (Fleet and other vehicles): Indicate which actions were taken in 2013:

Survey Question	Response
Do you have a fleet?	Yes
Replaced existing vehicles with more fuel efficient vehicles (gas/diesel)	Yes
Replaced existing vehicles with hybrid or electric vehicles	Yes
Reduced the overall number of fleet vehicles	No
Took steps to drive less than last year	Yes

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

UBC Building Operations, which manages the centrally managed campus fleet, has been working to improve the efficiency of its fleet of over 240 vehicles. Key actions include

implementing criteria towards achieving E3 (Energy, Environment, Excellence) certification status for sustainable fleet management and finalizing the Green Fleet Action Plan, a 5 year plan to reduce fleet emissions. In addition to working on resizing and retiring inefficient vehicles, UBC Building Operations also began working on adding compressed natural gas (CNG) to its list of alternatively fueled vehicles and began work on adding a CNG fueling station on campus.

Sustainable fleet management strategic goals, objectives, and performance metrics were also incorporated into department-level Sustainability Frameworks developed in 2013 for key operational departments on campus, including Building Operations and Student Housing and Hospitality Services.

3) Supplies (Paper): Indicate which actions were taken in 2013:

Survey Question	Response
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.)	Yes

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

In 2013, UBC reduced total paper consumption 16 per cent from 2012 levels. Since our 1999 baseline, UBC has reduced paper consumption by a total of 70 per cent per capita. In 2013, 71 per cent of total paper purchases contained 30 per cent post-consumer recycled (PCR) content or better.

UBC's preferred paper supplier, OfficeMax Grand and Toy, offers a broader offering of PCR stock at better pricing, including more competitively priced 30-100 per cent PCR content paper as well as Wheat Sheet paper, a forest-free paper alternative that uses waste wheat straw instead of wood fiber.

As part of UBC's Payment and Procurement Services (PPS) Sustainability Framework, PPS has set the target to eliminate the use of virgin paper and promote a minimum of 50 per cent PCR content and alternative fiber for paper purchases on campus.

4) Explain how you plan to continue minimizing emissions in 2014 and future years:

Continued implementation of UBC's core climate action projects (Continuous Optimization, Academic District Energy System (ADES) steam to hot water conversion, and Bioenergy Research and Demonstration Facility), will together achieve our targets of reducing emissions 33 percent by 2015, compared to 2007 levels. Key 2014 actions will include:

- Implementation of Phase 2 of the Continuous Optimization Program will re-commission 24 buildings

- 2MW cogeneration engine will start operation in Summer 2014 operated on Renewable Natural Gas (RNG)

- ADES Temporary Energy Centre will accelerate GHG savings from the Hot Water Conversion Project

For additional details, please refer to the UBC Annual Sustainability Report: http://sustain.ubc.ca/our-commitment/strategic-plans-policies-reports/annual-reports.

Actions to Promote Sustainability and Conservation – Optional

The following are actions that fall outside the scope of the Carbon Neutral Government Regulation, but which many organizations still undertake and may wish to report on. This section is optional for reporting.

Business Travel & Virtual Meeting Technology

Survey Question	Response
Created a low-carbon travel policy or travel reduction goal (Low-carbon: Lowest emission of greenhouse gases per kilometre per passenger)	No
Installed web-conferencing software (e.g., Live Meeting, Elluminate, etc.)	Yes
Made desktop web-cameras available to staff	No
Encourage alternative travel to meetings (e.g., bicycles, public transit, walking)	Yes
Encourage carpooling to meetings	Yes

Education and Awareness

Survey Question	Response
Have created Green, Sustainability, Energy Conservation, or Climate Action Teams	Yes
Provided resources and/or dedicated staff to support these teams	Yes
Provided behaviour change education/training for these teams (e.g., community-based social marketing)	Yes
Established a sustainability/green awards or recognition program	Yes
Support green professional development (e.g., workshops, conferences, training)	Yes

Planning for Climate Change

Survey Question	Response
Have assessed whether extreme weather events and/or long term changes in climate will affect our organization's business areas	Yes
Long term changes in climate have been incorporated into our organization's decision making	Yes

Staff Awareness and Education

Survey Question	Response
Provided education to staff about the science of climate change	Yes
Provided education to staff about the conservation of water, energy, and raw materials	Yes
Provided green tips on staff website or in newsletters	Yes

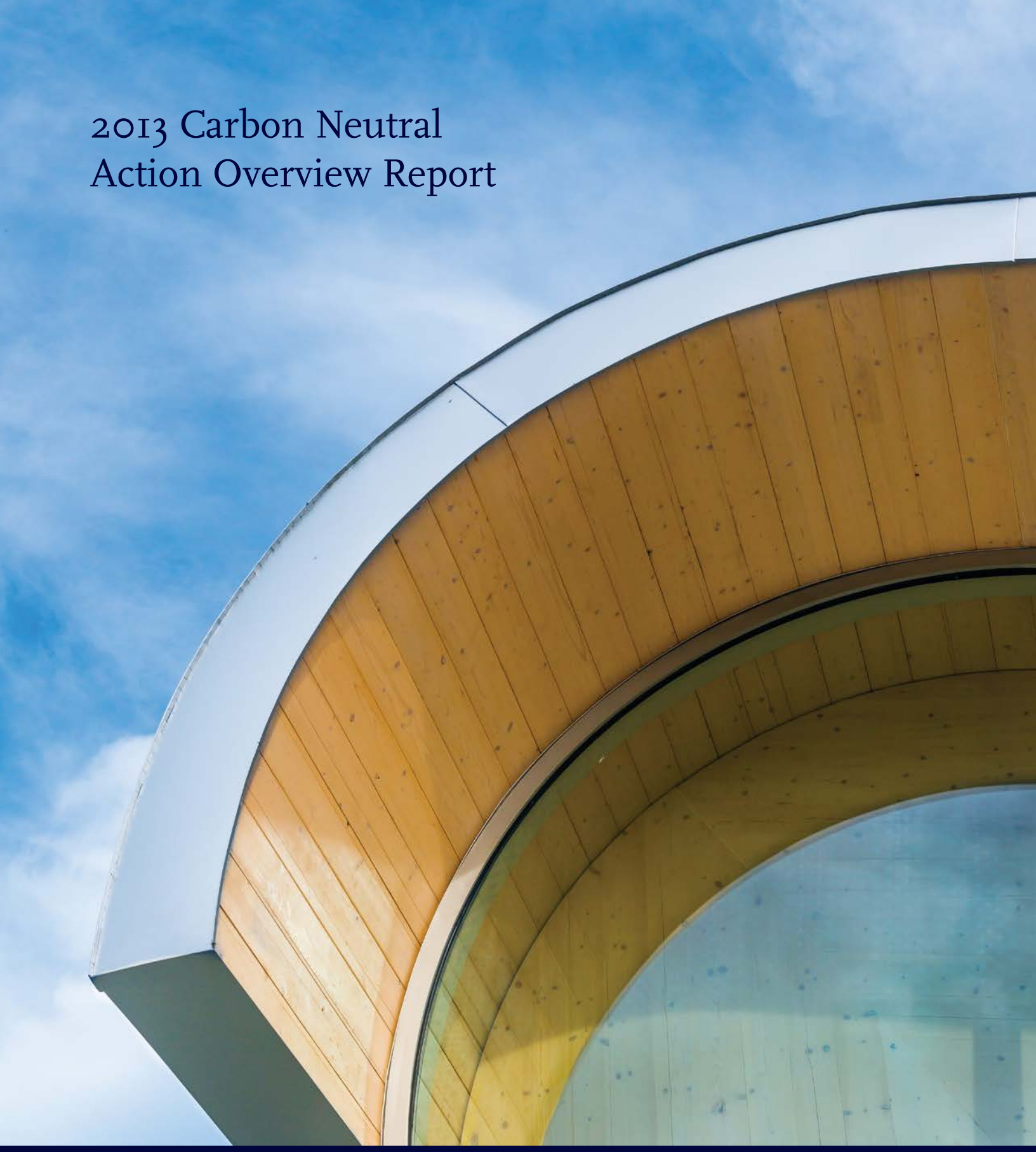
Alternate Work/Commuting Options

Survey Question	Response
Allow for telework/working from home	Yes
Staff have the option of a compressed work week	Yes
Commuting by foot, bicycle, carpool or public transit is encouraged	Yes
Shower or locker facilities are provided for staff/students who commute by foot or by bicycle	Yes
Secure bicycle storage is provided	Yes

Other Sustainability Actions

Survey Question	Response
Establish a water conservation strategy which includes a plan or policy for replacing water fixtures with efficient models	Yes
Put in place a potable water management strategy to reduce potable water demand of building-level uses such as cooling tower equipment, toilet fixtures, etc. and landscape features	Yes
Have put in place an operations policy to facilitate the reduction and diversion of building occupant waste from landfills or incineration facilities	Yes
Have implemented a hazardous waste reduction and disposal strategy (Hazardous Waste: E.g., electronics including computer parts and monitors, batteries, paints, fluorescent bulbs)	Yes
Have incorporated minimum recycled content standards into procurement policy for consumable, non-paper supplies (e.g., writing instruments, binders, toner cartridges, etc.)	Yes
Established green standards for goods that are replaced infrequently and/or may require capital funds to purchase (e.g., office furniture, carpeting, etc.)	No
Incorporated lifecycle costing into new construction or renovations	Yes
Please list and other sustainability actions you wish to report not included in the previous list. For additional details on UBC's sustainability initiatives, goals, and performance please refer to UBC's Annual Sustainability Reports online at: http://sustain.ubc.ca/our-commitment/plans-policies-reports	

2013 Carbon Neutral Action Overview Report



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OKANAGAN CAMPUS

ENVISIONING A SUSTAINABLE FUTURE

UBC is a recognized leader in sustainability. The UBC Okanagan campus has developed sustainability initiatives and commitments that support and advance Place & Promise: The UBC Plan.

The campus is committed to continue to responsibly steward sustainability at all organizational levels, to reduce its environmental impact and encourage a culture of sustainability. The Okanagan Sustainability Office was established to help deliver on UBC's sustainability commitments and aspires to foster leadership across the campus to broaden the impact of sustainability.

The 2013 *Carbon Neutral Actions Overview Report* was produced by the University of British Columbia, Okanagan Sustainability Office, Campus Planning and Development. It supplements the Carbon Neutral Actions Template and provides a high-level overview of the actions taken by the campus to reduce carbon emissions and create a culture of sustainability.

ACKNOWLEDGEMENTS

Many campus sustainability champions have contributed to the development of this report. Your ongoing commitments to sustainability, collaboration and accomplishments have been instrumental to the advancement of our collective sustainability goals.

Thank you for your contributions.

Roger Bizzotto, Associate Director, Facilities Management
Martin Gibb, Manager, Operations & Utilities
Colin Richardson, Manager, Geothermal
Alan King, Manager, Maintenance & Grounds
Robert Buonomo, Coordinator, Facilities Service Workers
Alan Prout, Coordinator, Facilities Service Assistants
Bill Dreaper, Coordinator, Electricians
Don Thompson, Chief Technology Officer, IT, Media & Classroom Services
Steve Rosco, Senior Manager, IT Infrastructure
Aaron Heck, Senior Manager, IT Client Services
Faiza Wilson, Manager, Finance & Administration, Risk Management Services
Doug Andrews, Manager, Payment & Procurement Services
Dave Adel, Procurement Officer, Payment & Procurement Services
Jack Boychuk, Team Lead, Payment & Procurement Services
Suzanne Nazareno, Acting Director, Student Housing & Hospitality Services

Prepared by: Leanne Bilodeau, Associate Director, Sustainability Operations, Okanagan Sustainability Office, Campus Planning & Development
Support from: Alisa Jannink, Advisor, Sustainability, & JoAnn Rennick Brown, Assistant to the Director, Campus Planning & Development
Designer: Margo Yacheshyn, University Relations
Contributing Photographers: Don Erhardt, Tim Swanky, Margo Yacheshyn, iStockphoto

University of British Columbia
Okanagan Sustainability Office – Campus Planning & Development
3333 University Way , Kelowna, BC V1V 1V7
sustain@ok.ubc.ca

CONTENTS

EXECUTIVE SUMMARY MICHAEL SHAKESPEARE

In 2013, UBC's Okanagan campus continued to deliver on its sustainability commitments, with particular emphasis on actions to reduce energy consumption and associated emissions that have led to measurable results.

The campus' environmental performance was demonstrated by a reduction in building, fleet and paper emissions over 2012 levels, despite the addition of a Fitness and Wellness Centre. Improvements in building carbon emissions per square meter and student FTE held steady in 2013, having demonstrated notable improvement since 2007, even with significant campus growth.

Environmental performance has been achieved through targeted energy and carbon reduction efforts in four key areas – district energy, green buildings, building optimization and community engagement.

A geo-exchange district energy system delivers aquifer ground-sourced heating and cooling and allows for energy sharing between buildings. Connected to the district energy system, the Fitness and Wellness Centre addition contemplates innovation in green building design through its adherence to LEED® Gold standards and the incorporation of carbon capturing and storing properties of locally-sourced pine beetle timber. A building optimization program, established in partnership with FortisBC, strategizes energy reduction in legacy academic buildings. A publicly accessible dashboard provides real-time building energy monitoring which complements "the Power of You", a community engagement based energy conservation and awareness strategy.

Moving forward, the campus will continue to focus on enhancing campus energy performance and community engagement. Continued optimization of the district energy system and retrofits and controls upgrades in legacy facilities will be undertaken to reduce energy consumption and associated carbon emissions. The foregoing actions will be complemented by campus planning efforts that contemplate future impacts of climate change and the development of innovative approaches to meet the challenges and opportunities ahead.

MICHAEL SHAKESPEARE, AVP Finance and Operations
University of British Columbia, Okanagan Campus

2013 CARBON NEUTRAL ACTION OVERVIEW REPORT

2013 GREENHOUSE GAS EMISSIONS

The following greenhouse gas emissions have been quantified using the BC Provincial Government's SMARTTool Reporting Framework. Fugitive Emissions have been reported in the CNAR online reporting tool.

Total Emissions Calendar Year	3,630 tCO2e
Buildings	3,017.4 tCO2e
Mobile Combustion	35 tCO2e
Office Supplies	73.5 tCO2e
Fugitive	504.1 tC02e

FUGITIVE EMISSIONS

The following fugitive emissions have been deemed by the British Columbia Provincial Government as out of scope for reporting:

- Gases used for research and medical purposes
- Type R22 HFC's from refrigerating units on campus
- Any emission sources that comprise less than 1% of the campus total greenhouse gases (GHG).

In-scope HFC's have been tracked since 2010 and are included in the Total Emissions Calendar Year 2013.

In 2013, in-scope HFC's were 504.1 tCO2e, approximately 13.9% of the campus' total emissions portfolio. This unanticipated increase is attributable to a chiller breakdown, which afforded the opportunity for replacement with a more energy efficient model.

The Okanagan campus anticipates a return to modest campus fugitive emissions as reported in previous years through continuous monitoring and preventative maintenance of chiller equipment. Facilities Management remains committed to tracking and monitoring HFC's and to making adjustments where possible to minimize future emissions from these and all sources.

OFFSETS APPLIED TO BECOME CARBON NEUTRAL IN 2013

Total emissions offset to become carbon neutral in 2013 as provided by SMARTTool as "total for offset" is 3629 tCO2e. 1 tCO2e reported as part of the Okanagan campus' GHG emissions profile in 2013 does not require offsets.

EMISSIONS REDUCTION ACTIVITIES

ACTIONS TAKEN TO REDUCE GREENHOUSE GAS EMISSIONS IN 2013

The following provides a high-level overview of actions and plans reported in the CNAR Actions Table.

A. Stationary Fuel Combustion, Electricity (Buildings)

The largest source of in-scope greenhouse gas emissions on campus derive from buildings. Absolute stationary building emissions decreased by over 106 tCO2e or 3.4%, compared to the 2012 reporting year, from 3,123.5 tCO2e in 2012 to 3,017.4 tCO2e in 2013 respectively.

Relative building greenhouse gas emissions per square meter has held relatively steady over the past several years, with an overall efficiency of 27% between 2007 and 2013 despite a 95% increase in square meter during this timeframe. Continued optimization of the campus district energy system, the integration of sustainable design concepts in building additions and renovations, and the promotion of voluntary actions to promote energy conservation among building occupants are among the contributing factors toward greater efficiencies and absolute emission reductions in this area.

ACTIONS:

- Completed the Fitness and Wellness Centre addition to the Gymnasium building to LEED® Gold standard, in line with the University's sustainable building and technical requirements.
- Replaced and upgraded a campus boiler in the Central Heating Plant with a new high efficiency condensing boiler which is anticipated to reduce campus greenhouse gas emissions by 145 tCO2e per year. The project was supported by FortisBC's Efficient Boiler Replacement Program which awarded the campus a $97,200 rebate. Complementary lighting retrofits were completed in the Central Heating Plant to replace incandescent lights with LED standard to reduce energy consumption and maintenance requirements.
- Replaced a damaged chiller with a new energy-efficient model to save 5% in annual energy costs.
- Completed 33% air-balancing of HVAC units into renovation of the Administration building for greater energy efficiency.
- Completed an intensification retrofit of valance lighting in the Administration building by replacing five hundred T12 34 watt fixtures (17,000 W) with three hundred T5 8 watt fixtures (2,400 W). The

transition away from inefficient T8 light bulbs to high-efficiency LED light bulbs resulted in 14,600 watts of immediate power savings.

- Completed the baseline phase of the Building Optimization Program in 2013, which involved monitoring building energy consumption in nine academic buildings, providing real-time feedback through a public dashboard.
- Launched first year of the Power of You (PoU) behavior change energy conservation and engagement strategy to encourage staff to take responsibility for reducing power consumption on campus.

B. Mobile Fuel Combustion

Although there was a slight increase in the number of campus fleet vehicles in 2013, the campus achieved a 22.7% reduction in fleet GHG emissions. This decrease was a result of a reduction in fuel consumption in faculty fleet and off-road vehicle fleet. In 2013, fleet accounted for 35 tCO2e, or 1% of total campus emissions. The campus has achieved a 48.5% absolute reduction in fleet emissions since 2010.

ACTIONS:

- Continued stewardship of sustainable mobile fuel combustion through adherence to Sustainable Fleet Procedures, replacement of retired fleet vehicles with electric and energy efficient models, and ongoing training and education to support sustainable fleet use.
- Replacement of two legacy gas golf carts with two new electric golf carts. Provided supplemental awareness training on the use of electrical vehicle charging stations on campus.
- Implemented measures to reduce reliance on fleet vehicles and divert the number of trips taken by encouraging fleet carpooling, walking or cycling, as well as combining off-campus trips intended for staff errands and tasks.

C. Supplies (Paper)

In 2013, emissions from paper accounted for 73.5 tCO2e, or 2% of the total of in-scope campus emissions. While office paper use has increased by 14.7% since 2010, comparison between 2012 and 2013 demonstrates a 2.7% absolute reduction in GHG emissions attributed to this source.

ACTIONS:

- Sourced 100% of the University's paper supply with a minimum of 30%, 50%, or 100% post-consumer recycled content as standard University policy.
- Incorporated the procurement and use of wheat sheet paper as an alternate paper source.
- Developed an internal online ordering webpage to facilitate the purchase of non-virgin paper.
- Reduced office paper delivery to campus from five days to two days as part of OfficeMax Grand & Toy's "Right Day Delivery" to help reduce scope three emissions associated with delivery of office paper supplies to campus.

PLANS TO CONTINUE REDUCING GREENHOUSE GAS EMISSIONS 2013-2014

A. Stationary Fuel Combustion, Electricity (Buildings)

- Roll-out the implementation phase of the Building Optimization Program to reduce energy consumption and emissions through technical retrofits and controls changes in legacy academic buildings.
- Continue existing efforts in campus community engagement to reduce energy consumption through the Power of You program.
- Continue to reduce energy consumption and associated GHG emissions by replacing inefficient equipment with high efficiency models.
- Continue to optimize the district energy system (DES) for greater operating efficiencies.
- Continue to provide education to the campus on the Pulse Public Energy Dashboard to provide building occupants with real time energy consumption feedback.
- Continue to maximize efficient space allocation in campus facilities.
- Continue to monitor and mitigate fugitive emissions by preventative maintenance and upgrades.

B. Mobile Fuel Combustion

- Encourage on-site contractors to adhere to anti-idling practices on campus.
- Continue the replacement of retired fleet vehicles with electric and energy efficient models, as well as purchase of new vehicles to energy efficient standard.
- Promote carpooling, car-sharing, and other forms of sustainable transportation on campus.

C. Supplies (Paper)

- Enable the use of print tracking software to provide reporting to clients on printing volumes to generate awareness and promote alternatives to printing.
- Continue to promote minimum 30% or greater post-consumer recycled paper content.
- Ensure that wheat sheet paper is available to order from the custom list as an alternative source to tree-derived paper.
- Implement digital signs, and related communications platforms to share campus news, activities, and events to reduce the reliance on paper-based promotional materials.

WHEAT PAPER AS AN ALTERNATE PAPER SOURCE

At UBC Okanagan, DOUG ANDREWS, Manager, Payment and Procurement strongly supports the use of alternate paper sources such as wheat sheet paper. See opposite page for further details.

ABOVE AND BEYOND:

Additional Measures to Reduce Emissions and Promote a Culture of Sustainability 2013

ENERGY CONSERVATION PHILOSOPHY & PRACTICES

THE POWER OF YOU

The Power of You is a two-year, executive endorsed, energy reduction awareness and engagement program developed by the Sustainability Office, in collaboration with many operational units on campus. Sponsored by FortisBC, the program was developed to encourage voluntary energy conservation actions on the part of campus constituents to complement the Building Optimization Program for greater energy reduction and associated cost avoidance. Data gathered from a campus baseline survey informed the program's development which involved volunteer recruitment and training and a range of engagement and energy conservation activities. In its first year, activities and awareness centered on energy conservation practices, such as turning off the lights and powering down computers and lab equipment, with targeted outcomes. For instance, a Lights Out Challenge yielded a participation rate of 49% and an 11% reduction in energy consumption in academic buildings over the one-hour time period compared to baseline. Conserving this amount of energy every noon hour for a year would save the campus $44,000 annually.

Power of You volunteers

The second year of the Power of You program will be developed and deployed in 2014/15 and will remain focused on community engagement and education toward voluntary actions to achieve ongoing environmental stewardship and conservation.

SUSTAINABLE RENOVATION OF LEGACY CAMPUS BUILDINGS

In 2013, significant renovations were undertaken to the University's Administration building. Aligned with UBC's sustainability commitments and technical guidelines, lighting retrofits, air balancing, and small structural renovations were completed to achieve sustainability performance and best practices in construction. Adjusting and regulating air flows contributed to a more comfortable indoor temperature and environment, improved humidity control, and increased heating and cooling efficiency, as well as energy savings.

Complementing the focus toward greater energy efficiency, the renovation project incorporated responsible waste management, the re-use and recycling of resources and the incorporation of low VOC materials. One thousand and seventy-one kilograms (1071 kg) of post-renovation demolition carpet tiles, which had an estimated remaining life expectancy of 20+ years, were donated to Habitat for Humanity. Existing doors and metal frames were also salvaged or re-purposed. Actions taken during the Administration building renovation highlight a coordinated approach and overall commitment to sustainability across all operational levels.

CENTRAL HEATING PLANT BOILER REPLACEMENT

Nearing a 25 year lifecycle, in 2013 a decision was made to replace an existing campus boiler with a new, high efficiency condensing boiler in the campus' Central Heating Plant. When running as supplemental to the district energy system, the new boiler is expected to increase energy efficiency, reduce utility costs and reduce campus GHG emissions by 145 tCO2e per year. The new boiler has resulted in improved operation and life cycle of the Central Heating Plant and flexibility in the case that future loads decrease.

MARTIN GIBB, Manager, Operations and Utilities, was a key player in the Boiler Replacement Project.

DO IT IN COLD WATER

Student Residence Cold Water Washing Pilot

As a component of the Power of You Program, "do it in cold water" – a student-focused behavior change pilot project was developed to engage students living in the Nicola Residence in actions they could take to reduce energy consumption and associated greenhouse gas emissions on campus.

The Nicola Residence is home to nearly 200 students, and is equipped with many amenities, including laundry facilities. With an overall objective to encourage the use of cold water settings for laundry washing as an alternate to hot or warm settings, students were engaged in a series of information sessions to generate awareness and determine ways in which they could participate in the initiative.

Water meters were installed to measure the volume of hot water used in the laundry facilities. Following a baseline phase, the pilot was deployed. Behaviour change strategies involved personal engagement with students in common areas, the use of social media such as Facebook and targeted education provided by Resident Advisors. The use of visual cues and reminders such as posters and tracking sheets posted at each machine helped the students document the frequency of cold-cold, warm-cold, and hot-warm load choices. The program's outcomes were evaluated primarily by measuring changes in the volume of hot water used for washing, supplemented with information from tracking sheets and survey information gathered pre and post program implementation.

As a result of changing their laundry washing choices, the students achieved an overall reduction of hot water use for laundry by 27%. It is anticipated that increased awareness will endure as the pilot outcomes and conservation philosophy are broadly shared.

THE HANGAR FITNESS & WELLNESS CENTRE ADDITION

The University's new Fitness and Wellness Centre (FWC), known as the "The Hangar" due to its design references to aviation, was completed to occupancy in 2013. An addition to the existing campus Gymnasium facility, the FWC was built to LEED® Gold equivalent standard.

A key consideration of the project was the optimization of innovative wood construction technology. To align with the Okanagan aesthetic and maximize sustainability, the FWC was crafted primarily with locally sourced beetle-kill wood configured in cross-laminated timber panels (CLT). The carbon-capturing and carbon-storing properties of this structure help to mitigate the campus' carbon footprint while maximizing environmental performance, malleable design, affordability, and structural reliability. Further, the CLT provides a natural finished surface, where interior finishing would have otherwise been required. In addition to multiple environmentally-sound properties, CLT also provides excellent acoustics, fire protection, strength, and thermal insulation.

The FWC's energy efficiency has been designed to exceed the Model National Energy Code for Buildings by a projected 45%. It is connected to the campus geo-exchange district energy system for heating and cooling requirements, crucial to maintain the temperature required for optimal sport performance, while reducing associated costs and emissions. Exterior sunshades and glazing were utilized to reduce cooling demands and improve the building's heating and cooling efficiency. Low-flow water fixtures installed are projected to reduce water consumption by approximately 40%. Supported by the University's first campus as a living laboratory xeriscaping project, drought-resistant, native plants were incorporated into the landscape design to manage low-water conditions and further reduce water demands and associated maintenance requirements. The FWC is a prime example of innovative green building design and construction practices that the University is committed to achieve in its building and renovation projects.

INNOVATION AND RECOGNITION

KELOWNA CHAMBER OF COMMERCE BUSINESS EXCELLENCE AWARDS – GREEN INNOVATOR

One of only three nominees for the prestigious Business Excellence Awards presented by the Kelowna Chamber of Commerce in 2013, UBC's Okanagan campus was acknowledged as a nominee for its strategic approach and achievements in sustainability. The nomination recognized the campus for its innovative approaches to environmental sustainability; for its methodology, accountability, and measurement of environmental impacts; and for incorporating green initiatives into its campus facilities and overall campus design. UBC's business strategy, innovative practices, measurable results, and competitive advantage were key principles recognized. UBC's enduring commitment to sustainability at the governance level and demonstrated sustainability achievements at all organizational levels was recognized as a model to other organizations seeking to advance their sustainability agenda.

REICHWALD HEALTH SCIENCES CENTRE

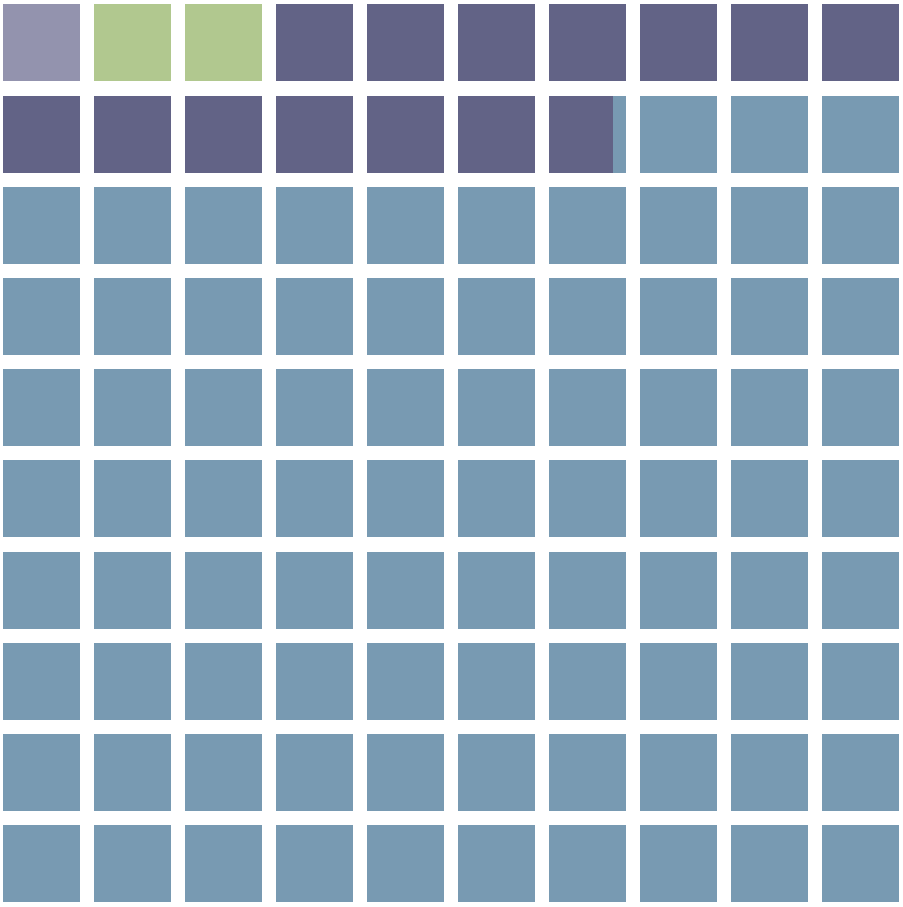
The Reichwald Health Sciences Centre (RHS) was a Gold Winner in the 'Best Outside of the Box' category during the 2013 Tommie Awards hosted by the Canadian Home Builders' Association of the Central Okanagan. LEED® Gold certified RHS was recognized for its sustainable construction, design features, and technologies to conserve water, energy, and reduce campus GHG emissions.

FORTISBC'S EFFICIENT BOILER PROGRAM REBATE

In 2013, the UBC Okanagan campus received $97,200 in a FortisBC Efficient Boiler Program rebate for the replacement of an inefficient boiler in the Central Heating Plant. Playing a direct role in reducing energy consumption and GHG emissions, the new boiler also works to save the campus operating costs and improves the performance of campus facilities. Implementing measures to reduce utility consumption through the installation of new energy efficient equipment, in conjunction with financial rebate opportunities, demonstrates continuous improvements led by the Okanagan campus to conserve energy.

GREENHOUSE GAS EMISSIONS BY SOURCE

FOR THE 2013 CALENDAR YEAR (tCO_2e*)



The following greenhouse gas emissions have been quantified using the BC Provincial Government's SMARTTool Reporting Framework.

1.0% 35	Mobile (fleet and other mobile equipment)
2.0% 74	Supplies (Paper)
13.9% 504	Fugitive (Refrigerants)
83.1% 3,017	Stationary (Building Heating and Generators) and Electricity

TOTAL EMISSIONS: 3,630

OFFSETS APPLIED TO BECOME CARBON NEUTRAL IN 2013

(Generated Apr. 14/2014 10:26 a.m.)

Total offsets required: 3,629. Total offset investment: $90,725.
Emissions which do not require offsets: 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.

** 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.

2013 CARBON NEUTRAL ACTION OVERVIEW REPORT FOR UBC'S OKANAGAN CAMPUS

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2013 Carbon Neutral Action Report (CNAR) - Part 2 ACTIONS SURVEY

Organization Name

University of British Columbia – Okanagan campus

Actions Taken to Reduce Emissions

1) Stationary Fuel Combustion, Electricity (Buildings): Indicate which actions were taken in 2013:

Survey Question	Response
Performed energy retrofits on existing buildings	Yes
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: The Power of You behavior change energy reduction engagement strategy, developed by the Okanagan Sustainability Office, encourages staff to take responsibility for reducing their power consumption on campus.	

2) Mobile Fleet Combustion (Fleet and other vehicles): Indicate which actions were taken in 2013:

Survey Question	Response
Do you have a fleet?	Yes
Replaced existing vehicles with more fuel efficient vehicles (gas/diesel)	Yes
Replaced existing vehicles with hybrid or electric vehicles	Yes
Reduced the overall number of fleet vehicles	No
Took steps to drive less than last year	Yes
Please list any other actions taken to reduce emission from fleet: The campus implemented an anti-idling fleet practice guideline to reduce emissions from idling vehicles.	

3) Supplies (Paper): Indicate which actions were taken in 2013:

Survey Question	Response
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.)	Yes

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

- Provided options for recycled-content and alternative paper sources.
- Decreased office paper delivery from five days to two days per week.
- Reduced the amount of paper hand-outs and materials in meetings and conferences.
- Streamlined and set all campus printers to double-sided printing as the default setting.

4) Explain how you plan to continue minimizing emissions in 2014 and future years:

- Optimization of the geo-exchange district energy system and the retro-commissioning of legacy academic buildings will continue to form the cornerstone of the University of British Columbia, Okanagan campus' energy and emission reductions activities.
- The Building Optimization Program will enter its implementation phase in 2014. The scope of work will include implementing energy conservation measures to reduce energy consumption and greenhouse gas emissions.
- The Power of You energy-reduction behavior change program will remain focused on the promotion and encouragement of sustainable practices and actions among the campus community.
- Persist with the replacement of outdated cables and equipment with new energy-efficient models.
- Continue to ensure all campus computers are set to auto-sleep.

Actions to Promote Sustainability and Conservation – Optional

The following are actions that fall outside the scope of the Carbon Neutral Government Regulation, but which many organizations still undertake and may wish to report on. This section is optional for reporting.

Business Travel & Virtual Meeting Technology

Survey Question	Response
Created a low-carbon travel policy or travel reduction goal (Low-	No

carbon: Lowest emission of greenhouse gases per kilometre per passenger)	
Installed web-conferencing software (e.g., Live Meeting, Elluminate, etc.)	Yes
Made desktop web-cameras available to staff	No
Encourage alternative travel to meetings (e.g., bicycles, public transit, walking)	Yes
Encourage carpooling to meetings	Yes

Education and Awareness

Survey Question	Response
Have created Green, Sustainability, Energy Conservation, or Climate Action Teams	Yes
Provided resources and/or dedicated staff to support these teams	Yes
Provided behaviour change education/training for these teams (e.g., community-based social marketing)	Yes
Established a sustainability/green awards or recognition program	Yes
Support green professional development (e.g., workshops, conferences, training)	Yes

Planning for Climate Change

Survey Question	Response
Have assessed whether extreme weather events and/or long term changes in climate will affect our organization's business areas	Yes
Long term changes in climate have been incorporated into our organization's decision making	Yes

Staff Awareness and Education

Survey Question	Response
Provided education to staff about the science of climate change	Yes
Provided education to staff about the conservation of water, energy, and raw materials	Yes
Provided green tips on staff website or in newsletters	Yes

Alternate Work/Commuting Options

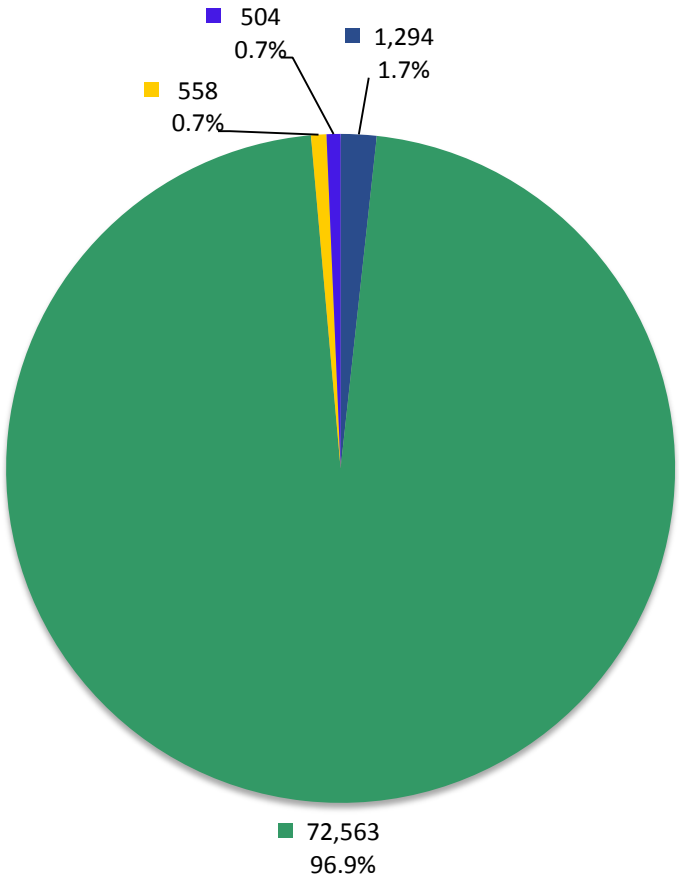
Survey Question	Response
Allow for telework/working from home	Yes
Staff have the option of a compressed work week	Yes

Commuting by foot, bicycle, carpool or public transit is encouraged	Yes
Shower or locker facilities are provided for staff/students who commute by foot or by bicycle	Yes
Secure bicycle storage is provided	Yes

Other Sustainability Actions

Survey Question	Response
Establish a water conservation strategy which includes a plan or policy for replacing water fixtures with efficient models	Yes
Put in place a potable water management strategy to reduce potable water demand of building-level uses such as cooling tower equipment, toilet fixtures, etc. and landscape features	Yes
Have put in place an operations policy to facilitate the reduction and diversion of building occupant waste from landfills or incineration facilities	Yes
Have implemented a hazardous waste reduction and disposal strategy (Hazardous Waste: E.g., electronics including computer parts and monitors, batteries, paints, fluorescent bulbs)	Yes
Have incorporated minimum recycled content standards into procurement policy for consumable, non-paper supplies (e.g., writing instruments, binders, toner cartridges, etc.)	Yes
Established green standards for goods that are replaced infrequently and/or may require capital funds to purchase (e.g., office furniture, carpeting, etc.)	No
Incorporated lifecycle costing into new construction or renovations	Yes
Please list and other sustainability actions you wish to report not included in the previous list. Please refer to UBC Okanagan's 2013 Carbon Neutral Action Overview Report.	

University of British Columbia
Greenhouse Gas Emissions by Source
for the 2013 Calendar Year (tCO_2e*)



Total Emissions: 74,919

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

Offsets Applied to Become Carbon Neutral in 2013 (Generated May 12, 2014 1:53 PM)

Total offsets required: **60,430**. Total offset investment: $**1,510,750**. Emissions which do not require offsets: **14,489** **

*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.