

2012 CARBON NEUTRAL ACTION REPORT



a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

sustainability

Table of Contents

Executive Summary	ii
Emissions Overview	iii
Part A: UBC Vancouver Campus	A
CNAR Overview	1
Actions Table	15
Part B: UBC Okanagan Campus	B
CNAR Overview	1
Actions Table	12
Part C: Emissions Source Report.....	iii

1. Executive Summary

In 2012, UBC's sustainability leadership was recognized with over 15 provincial, national, and international sustainability awards. The university has continued to build on this success by taking bold steps in sustainability that drive operational decisions and integrate teaching, learning and research opportunities. This report illustrates recent activities which focus on reducing greenhouse gas (GHG) emissions and advance sustainability at UBC's Vancouver and Okanagan campuses.

UBC's Vancouver campus made significant progress this past year towards achieving the Vancouver Campus Climate Action Plan's aggressive GHG reduction targets of 33 per cent below 2007 levels by 2015. In September 2012, UBC opened the Bioenergy Research and Demonstration Facility, making it Canada's first university – and one of a few institutions worldwide – to produce both clean heat and electricity for its campus from renewable bioenergy. The pioneering \$34-million clean energy facility will eliminate 9 per cent of UBC's Vancouver campus GHG emissions and generate enough clean electricity to power 1,500 homes. We also completed Phases 2 and 3 of one of the largest steam to hot water conversions in North America. When completed, it will replace 14 km of aging steam system piping infrastructure to reduce emissions by 22 per cent and save up to \$4 million a year in operational and energy costs. Finally, we are continuing to roll out our Continuous Optimization "Building Tune-up" program, which is retro-commissioning 72 buildings to reduce emissions in core buildings by 10 per cent. In collaboration with the University Neighborhoods Association (UNA), we also began developing a Community Energy & Emissions Plan for the UTown@UBC community, which will outline strategies for a low carbon future for UBC's residential community. We are also in the process of developing an Engagement and Social Marketing Strategy that will define the campus' engagement program priorities aimed at reducing energy, water and waste in student residences, labs and offices.

UBC's Okanagan campus experienced its first full year of operation in 2012 after the completion of an extensive seven year campus build-out. While the campus realized full occupancy of its most recently completed academic facilities in 2012, it achieved an absolute reduction in building greenhouse gas emissions in the same year. Overall the campus has demonstrated a 27 percent reduction in relative emissions over 2007 levels, despite a 95 percent increase in floor area. These significant achievements capture the effects of sustainable and energy efficient building design, the implementation of a closed loop geo-exchange district energy system (DES) and ongoing operational commissioning. In 2012, a three year Building Optimization Program (BOP) Agreement was finalized with FortisBC. The program provides real time energy monitoring, a publicly accessible energy dashboard, retro commissioning and controls optimization of original academic buildings, and the monitoring of four additional new academic facilities. The Power of You, a two year behavior change energy reduction strategy developed in 2012 will be deployed in 2013 to complement the implementation phase of the BOP. Phase 1 of the Power of You will engage faculty and staff in high impact activities targeted to increase energy conservation results achieved through the BOP. Going forward, the campus will continue to focus its efforts on advancing operational sustainability. The campus will work with relevant internal and external stakeholders to develop an operational sustainability plan to guide our actions over the coming years.

We are pleased to share with you some of the highlights of our climate action initiatives that were implemented in 2012.



Nancy Knight
Associate Vice-President
Campus and Community Planning
The University of British Columbia



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

2. Emissions Overview

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 the emissions for UBC's two main campuses along with key performance indicators.

Table 1: UBC's Vancouver and Okanagan Campuses 2012 Offsettable Emissions

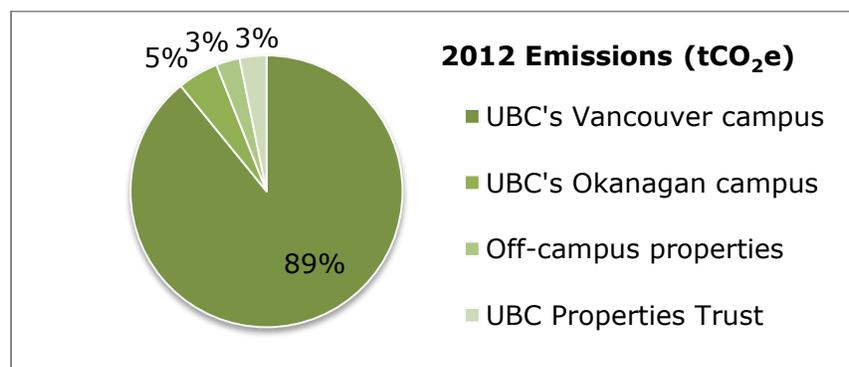
Key Performance Indicator	Vancouver Campus	Okanagan Campus
GHG Emissions (tonnes CO₂e)	60,715	3,316
Floor Space (square meters)	1,418,833	140,370
Staff and Faculty Employees (FTE)	13,206	967
Student Enrolment (FTE)	42,848	7,406
GHG Emissions per Student (tonnes CO₂e/FTE)	1.42	0.45

A summary of the emissions attributed to different off-campus units of UBC is provided in Table 2 and Figure 1. When emissions from off-campus properties are included, total offsettable emissions amounted to 68,115 tCO₂e in 2012. Biomass CO₂ emissions, amounting to 3,996 tonnes, are reported but are not required to be offset. Including biomass emissions, total emissions for UBC were 72,112 tonnes in 2012.

Table 2: UBC Total 2012 Emissions

Location	2012 emissions (tCO ₂ e)
UBC's Vancouver campus	60,715
UBC's Okanagan campus	3,316
Off-campus properties	1,913
UBC Properties Trust	2,171
Total offsettable emissions	68,115
Biomass CO ₂ emissions	3,996
Total emissions including biomass	72,112

Figure 1: UBC 2012 Offsettable Emissions by Location



2012 Carbon Neutral Action Report

University of British Columbia
Vancouver Campus

May 2013

campus + community planning
campus sustainability



a place of mind

THE UNIVERSITY OF BRITISH COLUMBIA

1. Executive Summary	2
3. Climate Action at UBC Vancouver	3
3.1. Overview and History	3
4. 2012 Greenhouse Gas Emissions	4
4.1. Emissions in Greater Detail	4
4.2. Comparison to Baseline Year	6
4.2.1 Scope 1 and 2 Emissions	6
4.2.2 Scope 3 Emissions	7
4.3. Offsets Applied to Become Carbon Neutral in 2012	8
4.4. Changes to 2010 and 2011 Emissions and Offsets Reporting	8
5. Emissions Reduction Activities	9
5.1. Actions Taken to Reduce Greenhouse Gas Emissions in 2012	9
5.1.1 Scope 1 and 2 Highlights	10
5.1.2 Scope 3 Highlights	11
5.2. Plans to Continue Reducing Greenhouse Gas Emissions 2013 – 2014	12
5.2.1 Scope 1 and 2 Emissions	12
5.2.2 Scope 3 Emissions	13
6. Links to Relevant Reports	14

1. Executive Summary

In 2012, UBC's sustainability leadership was recognized with over 15 provincial, national, and international [sustainability awards](#), including the prestigious [Excellence in Integration Award](#) from the International Sustainable Campuses Network, recognizing UBC's achievements in integrating operational and academic sustainability across campus, and APPA's inaugural Sustainability Award in Facilities Management, recognizing UBC's comprehensive campus sustainability achievements.

UBC's leadership in developing and implementing its comprehensive Climate Action Plan was also awarded [Best Case Study](#) by the Association for the Advancement of Sustainability in Higher Education (AASHE), and Honorable Mention by the Canadian Association of University Business Officers (CAUBO).

UBC has continued to build on this success by making significant progress on implementing the three core projects of our [Climate Action Plan](#), which together will achieve UBC's greenhouse gas (GHG) reduction targets of a 33 percent reduction in emissions by 2015 compared to 2007 levels:

- September 2012 marked the official opening of UBC Vancouver's [Bioenergy Research and Demonstration Facility](#), making it Canada's first university – and one of a few institutions worldwide – to produce both clean heat and electricity for its campus from renewable bioenergy. The pioneering \$34-million clean energy facility will eliminate 9 per cent of campus GHG emissions and generate enough clean electricity to power 1,500 homes.
- UBC completed Phases 2 and 3 of one of the largest [steam to hot water conversions](#) in North America. When finished, it will replace 14 km of aging steam system piping infrastructure to reduce emissions by 22 per cent and save up to \$4 million a year in operational and energy costs.
- The [Continuous Optimization "Building Tune-Up"](#) program is retro-commissioning 72 buildings to reduce emissions in core buildings by 10 per cent. A pilot in two buildings is complete, the next phase of implementation is underway in 17 buildings, and investigation of 40 more buildings is in progress.

Of the 113 actions and sub-actions identified in UBC Vancouver's comprehensive Climate Action Plan, 79 are complete, in progress or ongoing, 14 are under development, and a further 20 are longer-term goals that have not yet been started or were re-evaluated and removed.

UBC and the University Neighborhoods Association (UNA) also began developing a [Community Energy & Emissions Plan \(CEEP\)](#) for the UTown@UBC community, which will complement the Climate Action Plan for the academic campus and outline strategies for a low carbon future for UBC's residential community. UBC is also in the process of developing an Engagement and Social Marketing Strategy that will define the campus' engagement program priorities aimed at reducing energy, water and waste in student residences, labs and offices.

We are pleased to share with you some of the highlights of our climate action initiatives that were implemented in 2012.



Executive Approval

Nancy Knight

Associate Vice President – UBC Campus and Community Planning

3. Climate Action at UBC Vancouver



UBC's Bioenergy Research and Demonstration Facility, opened September 2012. Credit: Don Erhardt

3.1. Overview and History

In 1997, UBC was the first Canadian university to adopt a sustainable development policy. A year later, it was the first to open a Campus Sustainability office. Within a decade, UBC met its Kyoto targets for academic buildings—five years early and despite increasing our building floor space by 35 percent and student enrolment by 48 percent.

In 2010, UBC's Vancouver Campus [Climate Action Plan](#) committed us to bold greenhouse gas (GHG) emission reduction targets—33 per cent by 2015, 67 per cent by 2020, and 100 per cent by 2050, compared to 2007 levels. We're now investing in large-scale energy retrofits, alternative energy systems, and engagement strategies to meet these ambitious climate goals.

2012 marks the third year of implementing the Plan, which identifies detailed GHG emissions reductions strategies in the areas of:

- Campus Development and Infrastructure
- Energy Supply and Management
- Fleets and Fuel Use
- Food
- Transportation
- Business Travel and Procurement

For more information, read the award-winning AASHE Case Study on [Implementing UBC's Climate Action Plan](#). To learn more about UBC's sustainability initiatives, visit our [Sustainability Milestones](#) page and the [Plans and Reports](#) section of our website.

4. 2012 Greenhouse Gas Emissions

With over 48,000 students, 13,000 staff and faculty, and an institutional footprint of 402 hectares, UBC is one of the largest universities in Canada. The Vancouver campus is home to 368 institutional buildings owned by UBC, totalling 14.7 million square feet.

In 2012, total offsettable GHG emissions for UBC's Vancouver campus amounted to 60,715 tonnes CO₂e. Since 97 per cent of these emissions come from Vancouver campus buildings, with 73 per cent of the total occurring at the campus steam plant, key actions focus on improving energy efficiency in campus buildings and connecting alternative energy sources to the campus district energy system.

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.

4.1. 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 2012, the offsettable Vancouver Campus emissions amounted to 60,715 tCO₂e. A detailed breakdown of the campus emission sources is provided in *Table 1*.

Table 1: UBC's Vancouver Campus Offsettable Emissions, 2012

Source	2007 emissions (tCO ₂ e) ¹	2012 emissions (tCO ₂ e) ¹	Per cent of 2012 campus emissions ¹
UBC Vancouver Campus – Core buildings²	46,478	43,287	71%
<i>Steam (natural gas and light fuel oil)</i>	40,106	34,925	58%
<i>Natural gas (direct burn)</i>	3,515	4,214	7%
<i>Electricity</i>	2,856	3,887	6%
<i>Biomass facility³</i>	N/A	261	0.4%
UBC Vancouver Campus – Ancillary buildings⁴	11,405	15,407	25%
<i>Steam (natural gas and light fuel oil)</i>	7,311	9,347	15%
<i>Natural gas (direct burn)</i>	3,108	4,758	8%
<i>Electricity</i>	986	1,251	2%
<i>Biomass facility³</i>	N/A	51	0.1%
TRIUMF⁵	222	196	0.3%
Fleet	1,973	1,253	2%
Paper	1,003	572	1%
Total Vancouver Campus Offsettable Emissions	61,082	60,715	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 CH₄ and N₂O 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, 2012

Source	2012 emissions (tCO ₂ e)
UBC Properties Trust – Owned Buildings¹	2,168
UBC Robson Square Campus	181
Other Off-Campus Properties²	1,510
Joint Ventures with other universities³	222
Great Northern Way Campus	197
Bamfield Marine Sciences Centre	25
UBC Properties Trust – Paper	3
Total Off-Campus Property Emissions	4,084

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 5 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.

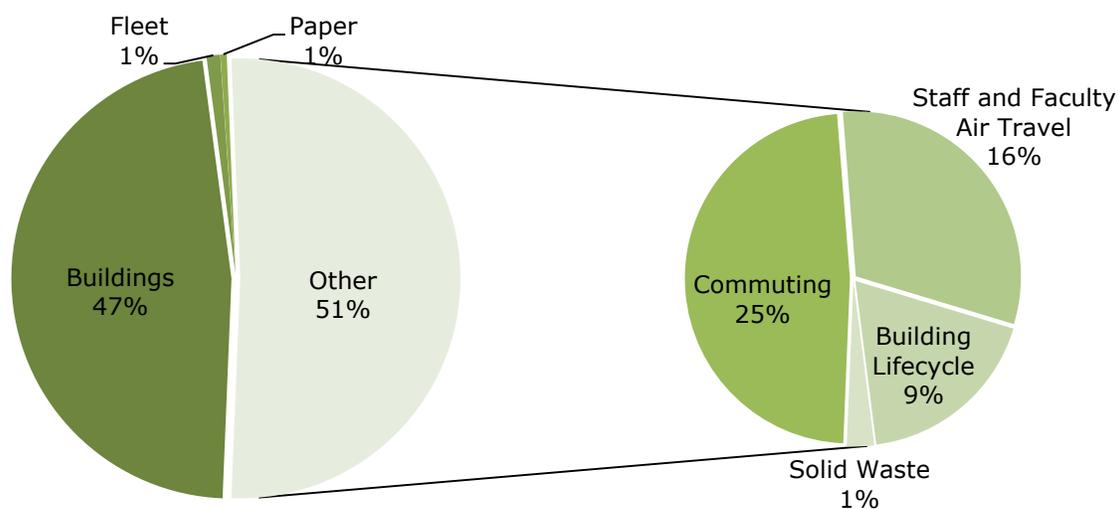
Table 3: UBC's Vancouver Campus Scope 3 Emissions, 2012

Source	2007 emissions (tCO ₂ e)	2012 emissions (tCO ₂ e)
Commuting	28,880	30,755
Staff and Faculty Air Travel	13,600¹	19,770
Building Lifecycle	10,190	11,705
Solid Waste	1,930	1,760²

¹ Not calculated in 2007; the value from 2006 is provided.

² Data for 2012 unavailable at time of publication; the value from 2011 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 2012. *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, 2012

4.2. Comparison to Baseline Year

4.2.1 Scope 1 and 2 Emissions

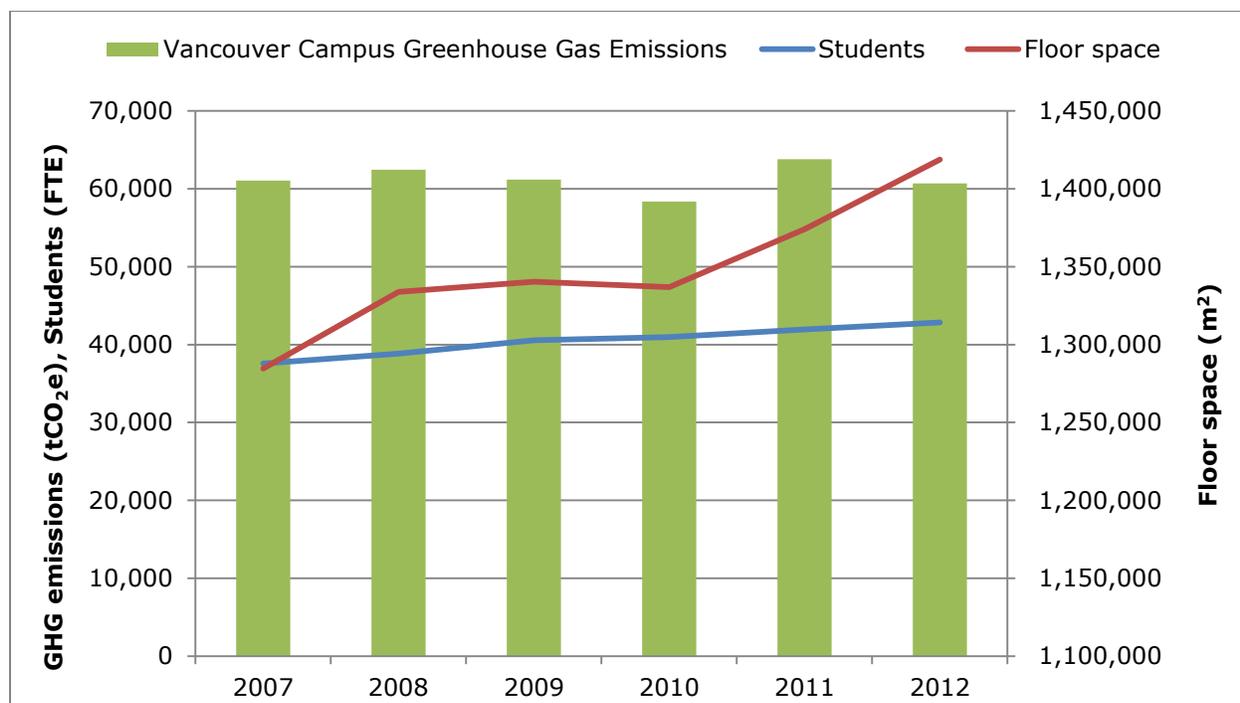
UBC's Vancouver Campus offsettable emissions decreased 0.6 per cent from 2007 to 2012, despite a 10 per cent increase in building floor space and a 14 per cent increase in student enrolment. The emissions from campus buildings along with fleet and paper amounted to 1.42 tCO₂e per full-time equivalent student in 2012, a 13 per cent decrease in emissions per student since 2007.

UBC's Vancouver Campus building floor space increased by over 134,000 m² between 2007 and 2012, with several older buildings demolished to make way for construction of 26 new buildings. Notable new buildings that opened in 2012 include Pharmaceutical Sciences & Centre for Drug Research and Development, Earth Sciences Building, and the Bioenergy Research and Demonstration Facility.

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 5,200 full-time equivalent (FTE) students from 2007 to 2012 while faculty and staff increased by 1,160 employees.

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

Key Performance Indicator	2007	2012	Change from 2007 to 2012
GHG Emissions (tonnes CO₂e)	61,082	60,715	-0.6%
Staff and Faculty Employees (FTE)	12,045	13,206	+10%
Student Enrolment (FTE)	37,589	42,848	+14%
GHG Emissions per Student (tonnes CO₂e/FTE)	1.62	1.42	-13%
Floor Space (square meters)	1,284,592	1,418,833	+10%
GHG Emissions per square meter (tonnes CO₂e/m²)	0.048	0.043	-10%

Figure 2: UBC's Vancouver Campus Offsettable Emissions and Growth, 2007 to 2012

4.2.2 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 2012, student, staff and faculty population increased at a greater rate, resulting in a 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 2012.

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 emissions¹.

Building lifecycle emissions are proportional to campus floorspace, which increased from 2007 to 2012. Solid waste emissions decreased from 2007 to 2012 despite the increase in campus population during that time. The total amount of waste decreased over that period, along with a 25 per cent increase in diversion rates (i.e. recycling and composting).

UBC's [Climate Action Plan](#) includes strategies for reducing Scope 3 emissions related to commuting, business travel, procurement and food, as outlined below and in the full [Climate Action Plan Report](#).

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.

4.3. Offsets Applied to Become Carbon Neutral in 2012

As required by provincial regulation, UBC purchased a total of 64,799 tonnes of offsets from the Pacific Carbon Trust for UBC's Vancouver Campus and off-campus properties to become carbon neutral for 2012 (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, CO₂ emissions from biomass at the Bioenergy Research and Demonstration Facility are considered carbon neutral. These emissions, reported as biomass in SMARTTool, amounted to 3,995 tonnes CO₂e and are not required to be offset. Including biomass emissions, total emissions for the UBC Vancouver Campus and off-campus properties amount to 68,794 tonnes CO₂e in 2012 (see *Table 5*).

Table 5: Total 2012 Emissions for UBC's Vancouver campus and off-campus properties

Location	2012 emissions (tCO ₂ e)
UBC's Vancouver campus	60,715
Off-campus properties	4,084
Total offsettable emissions	64,799
Biomass CO ₂ emissions	3,995
Total emissions including biomass	68,794

4.4. Changes to 2010 and 2011 Emissions and Offsets Reporting

Several corrections were made to the 2010 and 2011 emissions reporting for off-campus properties. The corrected emissions for the combined UBC's Vancouver Campus and off-campus properties are summarized in *Table 6* below. UBC under-reported in 2010 and 2011 and this year purchased an additional 418 tonnes of offsets to continue to be carbon neutral for 2010 and 2011.

Table 6: Corrections to 2010 and 2011 Emissions

Category	Reported Emissions (tCO ₂ e)	Corrected Emissions (tCO ₂ e)	Additional offsets purchased (tCO ₂ e)
Total 2010 offsettable emissions	61,457 ¹	61,649	192
Total 2010 emissions including biomass	61,520 ¹	61,712	
Total 2011 offsettable emissions	67,570	67,796	226
Total 2011 emissions including biomass	67,616	67,842	

¹ After applying a correction and purchasing additional offsets in the 2011 reporting year.

5. Emissions Reduction Activities



Converting UBC's district heating system from steam to hot water will reduce emissions by 22 per cent. Credit: Don Erhardt

5.1. Actions Taken to Reduce Greenhouse Gas Emissions in 2012

UBC's Vancouver Campus [Climate Action Plan](#) sets out actions in six areas that are the key sources of UBC's GHG emissions. Of the 113 actions and sub-actions identified in UBC Vancouver's comprehensive Climate Action Plan, 79 are complete, in progress or ongoing, 14 are under development, and a further 20 are longer-term goals that have not yet been started or were re-evaluated and removed. A summary of key achievements are presented here and the full Climate Action Plan report is [available online](#).

In 2012, UBC made significant progress on implementing the three core projects of our [Climate Action Plan](#), which will achieve UBC's aggressive GHG reduction targets of 33 percent reduction in GHG emissions by 2015 compared to 2007 levels:

- September 2012 marked the official opening of UBC Vancouver's [Bioenergy Research and Demonstration Facility](#) (BRDF), making it Canada's first university – and one of a few institutions worldwide – to produce both clean heat and electricity for its campus from renewable bioenergy. The pioneering \$34-million clean energy facility will eliminate 9 per cent of campus GHG emissions and generate enough clean electricity to power 1,500 homes.
- UBC completed Phases 2 and 3 of one of the largest [steam to hot water conversions](#) in North America. When finished, it will replace 14 km of aging steam system piping infrastructure to reduce emissions by 22 per cent and save up to \$4 million a year in operational and energy costs. A total of 19 buildings are now connected.
- The [Continuous Optimization "Building Tune-Up"](#) program is retro-commissioning 72 buildings to reduce emissions in core buildings by 10 per cent. A pilot in two buildings is complete, the next phase of implementation is underway in 17 buildings, and investigation of 40 more buildings is in progress.

5.1.1 Scope 1 and 2 Highlights



UBC's new Stromer electric bicycles and electric-drive Smart cars. Credit: Don Erhardt

In addition to the three major capital projects that will achieve the majority of emissions reductions, over 40 staff in Climate Action Teams are championing transformation in their departments and across campus to contribute to climate action and sustainability at UBC.

In 2012, the third year of implementing the Plan, highlights in the areas of direct and indirect energy include:

Energy Supply and Management

- **Server consolidation:** The [new University Data Centre \(UDC\)](#) in the new Pharmaceutical Sciences Building addresses the university-wide need for suitable space for housing computing infrastructure. The energy-efficient design, in conjunction with leading-edge cooling technologies, will reduce power utilization. Researchers writing proposals for high performance computing infrastructure and departments or units considering expansion of computing facilities are encouraged to locate in the new UDC instead of installing servers elsewhere.

Fleets and Fuel

- **Electric vehicles:** [UBC Building Operations](#) is greening its fleet with the purchase of five electric-drive Smart cars and two Stromer electric bicycles with trailers for trades staff who travel around campus without heavy loads.

Development and Infrastructure

- **Technical Guidelines:** In 2012 the Interior Building Lighting, Exterior Building Lighting and Indoor Thermal Environment sections of the [Technical Guidelines](#) underwent major revisions with a focus on energy efficiency and standardization. In addition, new energy performance requirements for new construction and major renovations were written into the Sustainability section of the Technical Guidelines.

5.1.2 Scope 3 Highlights



UBC SEEDS student project helps Triple O's lead way to zero waste. Credit: Josie Midha

UBC's Climate Action Plan includes strategies for reducing Scope 3 emissions related to food, procurement, business travel and commuting. Highlights from 2012 include:

Food

- **Triple O's waste sorting and fair trade:** A [Social Ecological Economic Development Studies \(SEEDS\)](#) student project developed signage for sorting recyclables, garbage and compost at the [White Spot Triple O's](#) in the David Lam building – the first partnership with a franchise on campus. As a result, the restaurant went from sending nearly all its waste to the landfill to recycling or composting about 85 per cent. Triple O's is also the first franchise on campus to switch to serving only fair trade coffee, putting it in line with all UBC Food Services outlets.

Transportation (Commuting)

- **Bicycle parking:** The Chemistry/ Physics [secure bike parking](#) facility opened its doors in September 2012 to waiting users. With space to store 45 bicycles, a bicycle repair center equipped with tools and an air pump, and facilities for changing and storing cycling apparel, the new space adds high value for staff and students in the area. The facility's bright green colour and unique architectural features also bring vibrancy to this section of campus.

Procurement and Business Travel

- **UBCBuySmart:** Launched in October 2012, [UBCBuySmart](#) is a resource for selecting sustainable partners. Anyone on campus will be able to benefit from campus wide contracts and can find them all in one location, including sustainable partners identified by a leaf icon.

5.2. Plans to Continue Reducing Greenhouse Gas Emissions 2013 – 2014



UBC's Building Tune-Up program will reduce emissions by 10 per cent.

5.2.1 Scope 1 and 2 Emissions

To achieve UBC's ambitious emissions target of becoming a net energy producer by 2050, UBC has invested in several major capital projects that will be examples for cutting edge clean energy technology and innovative industry partnerships. Over the next three years these projects will achieve UBC's goal of reducing emissions by 33 per cent by 2015:

Converting district heating system to a hot water system

Phases 4 through 7 of this project will be completed in 2013-2014. The \$88 million [steam to hot water conversion](#) will heat 130 buildings on campus when it is completed in 2017, reducing UBC's GHG emissions by 22 per cent. The largest source of savings comes from the system's ability to heat the campus while operating at a significantly lower temperature than the outgoing steam system, reducing distribution losses. The lower temperature of the system also enables researchers, students, staff and corporate partners to explore and integrate green technology and best practices in such areas as geothermal energy, ocean thermal energy, solar energy and waste heat recovery. The conversion project is a long-term investment with payback period of almost 25 years, but the lifetime of the district energy system is much longer than that – it is a major investment in sustainable infrastructure with a lifetime of sixty to eighty years.

Bioenergy Research and Demonstration Facility

When the [Bioenergy Research and Demonstration Facility](#) (BRDF) ramps up to full capacity in 2013, it will eliminate 9 per cent of campus GHG emissions and provide 25 per cent of UBC's average district heat when operating in thermal mode and 12 per cent in cogeneration mode. In cogeneration (or demonstration) mode, the system will generate two megawatts of cost-effective clean electricity. This is up to six per cent of the campus's average electrical demand and 4.5 per cent of peak demand, equivalent to the amount of electricity needed to power 1,500 homes. Showcasing the campus as a living lab, the BRDF will also provide research and learning opportunities for faculty and students in the clean energy sector.

Continuous Optimization (Building Tune-Up)

The [Continuous Optimization “Building Tune-Up”](#) program will operate in 72 buildings totaling 7.7 million square feet. It will reduce energy consumption and GHG emissions in core buildings by 10 per cent through retro-commissioning measures with a combined simple payback of 5 years or less. Implementation of energy conservation measures already underway in Phase 1 for 2.1 million square feet of research-intensive floor space will be completed in 2013. Implementation in 20 academic and administrative buildings in Phase 2 will begin in 2013, followed by 20 buildings in Phase 3 in 2014. Future phases will address the remaining buildings.

5.2.2 Scope 3 Emissions

While not directly responsible for Scope 3 GHG emission sources, UBC recognizes that they are within its sphere of influence and that the University can act to mitigate these emissions. Key initiatives over the next few years will continue to move the campus toward a low carbon future.

Some highlights of activities targeting scope 3 emissions include:

Transportation

- **Electric Vehicles:** Through the Provincial Community Charging Infrastructure Fund, UBC is installing 18 electric vehicle charging stations on campus. Ten of these stations will be dedicated to UBC's fleet, as an ongoing commitment to reduce campus emissions. The remaining eight public access stations will be located at Thunderbird Parkade.

Procurement and Business Travel

- **Paper:** Beginning in 2013, 50 per cent recycled content paper will be the new standard offering under the [new paper supply contract](#) with Grand & Toy. In addition, Grand & Toy has committed to reduce the number of its delivery trips to campus from five days per week to three days per week.

Food

- **Local food production:** A new hoop house will allow the [UBC Farm](#) to add a greater diversity of fruits and vegetables in the early season, and will also extend what can be offered in the fall, with the growing season now stretching into October. A new cooler added in 2012 allows for increased storage of UBC Farm produce for sale to campus outlets and market-goers.

6. Links to Relevant Reports



Visit sustain.ubc.ca to learn more about UBC's Climate Action Plan.

UBC Sustainability Initiative

<http://sustain.ubc.ca/>

UBC Climate and Energy

<http://sustain.ubc.ca/campus-initiatives/climate-energy>

UBC Climate Action Plan

<http://sustain.ubc.ca/campus-initiatives/climate-energy/climate-action-plan>

UBC Sustainability Plans and Reports

<http://sustain.ubc.ca/our-commitment/strategic-plans-policies-reports>

Case Study: Implementing UBC's Climate Action Plan

<http://www.aashe.org/resources/case-studies/implementing-ubcs-climate-action-plan>

University of BC - Vancouver Campus - 2012 Carbon Neutral Action Report

Actions Towards Carbon Neutrality

The actions listed below contribute to a reduction in greenhouse gas emissions from sources for which public sector organizations are responsible under the carbon neutral government regulation of the Greenhouse Gas Reduction Targets Act.

Action	Status	Steps Taken	Steps Planned	Start Year	End Year
Mobile Fuel Combustion (Fleet and other)					
Behaviour change program					
Provide fleet driver training to reduce fuel use	Ongoing/In Progress	Continued to provide annual driver training.	New fuel-efficient driving policy and driver training program will be released in 2013/14.	2009	No End Date (Continuous)
Introduce anti-idling policy and/or raise anti-idling awareness for fleet drivers (e.g., signs, stickers, messages)	Ongoing/In Progress	Continued reminders of anti-idling guidelines via email and safety training.	New anti-idling policy and training will be released in 2013/14. New tracking devices will allow monitoring and reporting on idling times.	2008	No End Date (Continuous)
Encourage carpooling in fleet vehicles	Ongoing/In Progress	Trades staff travel to work sites on campus in shared vehicles with minimum two occupants.	As part of E3 certification, trip and route planning will be completed to promote more carpooling.	2009	No End Date (Continuous)
Promote alternatives to fleet vehicle travel where possible (e.g., bicycles, public transit, walking)	Ongoing/In Progress	Existing bike-share program available to Building Operations staff was augmented by purchase of two electric bikes with trailers for light-duty trades use.	A new mobile stores service will consolidate daily trips to deliver parts to buildings so that staff can walk to job sites.	2009	No End Date (Continuous)
Other Mobile Fuel Combustion Actions					
Use alternative fuels	Ongoing/In Progress	B5 biodiesel was dispensed at on-campus fuel station.	A compressed natural gas dispensing station will be installed to fuel a new CNG garbage truck. Investigating potential for hydrogen fuel generated using syngas from the Bioenergy Research and Demonstration Facility.	2008	No End Date (Continuous)
Purchase electric vehicles	Ongoing/In Progress	Building Operations replaced five electric vehicles that were not meeting needs (Might-E Trucks) with electric-drive Smart cars, and purchased two new Stromer electric bicycles with trailers for trades staff to use on campus.	Continue adding light-duty electric vehicles to the fleet. Investigating heavy-duty electric vehicles.	2009	No End Date (Continuous)
Provide charging infrastructure for electric vehicles.	Ongoing/In Progress	UBC researchers invented a safe, efficient technology to wirelessly charge electric vehicles using remote magnetic gears and successfully tested it on campus service vehicles. Four wireless charging stations were installed at the Building Operations parking lot and service vehicles were retrofitted with new technology. Tests show the system is more than 90 per cent efficient compared to a cable charge. A full charge takes four hours and enables the vehicle to run throughout an eight-hour shift. Wireless charging addresses the challenge of connecting cords in poor conditions. With the wireless system, drivers simply park the car and the charging begins automatically.	Through the Provincial Community Charging Infrastructure Fund, UBC is installing 18 electric vehicle charging stations on campus in 2013. Ten of these stations will be dedicated to fleet vehicles.	2008	No End Date (Continuous)
Vehicle fuel efficiency					
Replace vehicles with more fuel-efficient models	Ongoing/In Progress	Building Operations retired six vehicles based on poor performance.	Continue to replace older inefficient vehicles with fuel-efficient models, and purchase hybrid and electric vehicles when appropriate.	2009	No End Date (Continuous)
Replace larger vehicles with smaller models according to fleet "right-sizing" principles	Ongoing/In Progress	Building Operations entered an LOI with Automotive Resources International (ARI) to conduct a complete analysis of the current fleet and provide a project plan for right-sizing.	All new vehicle purchases will undergo a needs assessment and right-sized model will be selected from four standardized models that serve the light-duty trades (Sprinter, Tacoma, Transit and Smart).	2009	No End Date (Continuous)
Perform regular fleet maintenance to improve fuel-efficiency	Ongoing/In Progress	On-campus fleet vehicles are brought to onsite garage every six months for preventive maintenance.	New tracking devices will allow predictive maintenance (i.e. triggered by a change in fuel efficiency).	2009	No End Date (Continuous)
Stationary Fuel Combustion, Electricity					
Behaviour change program					
Help staff reduce personal energy use through "workstation tune-ups"	Not Yet Evaluated				No End Date (Continuous)
Ask staff to unplug electrical equipment or switch off power bars when not in use	Ongoing/In Progress	Development of a Campus Sustainability Engagement and Social Marketing Strategy, which will target energy conservation across	Launch of energy conservation pilots in laboratories and student residences. The high impact behaviours in labs will focus on	2009	No End Date (Continuous)

University of BC - Vancouver Campus - 2012 Carbon Neutral Action Report

Actions Towards Carbon Neutrality

The actions listed below contribute to a reduction in greenhouse gas emissions from sources for which public sector organizations are responsible under the carbon neutral government regulation of the Greenhouse Gas Reduction Targets Act.

Action	Status	Steps Taken	Steps Planned	Start Year	End Year
		offices, labs and student residences across campus. Work in 2012 included analysis to determine high impact behaviours in energy, water and waste in offices, labs and residences, best practice analysis for each campus environment and development of energy conservation pilots for labs and residences.	upgrading, defrosting, cleaning and maintaining electrical equipment such as freezers and refrigerators.		
Ask staff to unplug electrical equipment or switch off power bars when not in use	Ongoing/In Progress	Development of a Campus Sustainability Engagement and Social Marketing Strategy, which will target energy conservation across offices, labs and student residences across campus. Work in 2012 included analysis to determine high impact behaviours in energy, water and waste in offices, labs and residences, best practice analysis for each campus environment and development of energy conservation pilots for labs and residences.	Launch of energy conservation pilots in laboratories and student residences. The high impact behaviours in labs will focus on upgrading, defrosting, cleaning and maintaining electrical equipment such as freezers and refrigerators.	2009	No End Date (Continuous)
Ask staff to close blinds at end of work day to reduce heating/cooling demands	Ongoing/In Progress	Promotion of the 2012 National Sweater Day to UBC's staff Sustainability Coordinators, their departments and to UBC's two first year residences. Promotion of heat saving tips such as wearing seasonally appropriate clothing, turning down the thermostat by 2 degrees and closing blinds/curtains at the end of the work day to conserve building heat loss.	No work planned in this area for 2013/14 as blinds were not deemed high impact in our analysis of energy conservation potential in labs, offices and student residences.	2010	2012
Provide tips to staff on saving energy in the office while working outside of regular business hours	Ongoing/In Progress	Ongoing promotion of lights-out and computer energy conservation toolkits, which ask staff who are last to leave the work place to make sure all lights are turned off and that non-essential equipment is unplugged and computers turned off.	Ongoing promotion of energy conservation related behaviours through the Sustainability Coordinator Program targeting offices and the Green Research Program targeting labs.	2008	No End Date (Continuous)
Encourage use of stairs instead of elevators	Ongoing/In Progress	Encouraged over 3,100 first year students in UBC's Totem Park and Place Vanier residences to use stairs instead of elevators during the 3rd annual Do It in the Dark energy competition in November 2012. Poster prompts placed near all elevators and stairwells.	Continued promotion of stair use over elevators in the 2013 Do It in the Dark residence energy conservation competition. No other plans for stair use instead of elevator promotion for 2013-14 as this behaviour was not deemed high impact for the UBC campus through the Campus Sustainability Engagement Strategy impact analysis.	2011	No End Date (Continuous)
Provide reminders for turning off lights (e.g., signs, stickers, messages)	Ongoing/In Progress	Lights-out stickers, lights-out posters, computer-off stickers, unplug stickers and energy conservation posters available through the Campus Sustainability office. This is continuous.	Pilot program in Totem Park student residence on lights off behaviours in student residences in Spring 2013. Likely scale up of lights out campaign to both first year residences in the September 2013 - April 2014 academic year. This behaviour was deemed high impact for student residences through the Campus Sustainability Engagement Strategy impact analysis.	2008	No End Date (Continuous)
Promote hot water conservation	Ongoing/In Progress	Encouraged over 3,100 first year students in UBC's Totem Park and Place Vanier residences to conserve hot water in the 2012 Do It in the Dark energy conservation competition. Shower timers installed in all bathrooms in these buildings and poster prompts about hot water conservation placed near showers, sinks and laundry rooms.	Pilot program in Totem Park student residence around cold water washing and shorter shower times, which both promote hot water conservation. Likely scale up of cold water washing and shorter shower times in both first year residences in the September 2013 - April 2014 academic year. This behaviour was deemed high impact for student residences through our Campus Sustainability Engagement Strategy impact analysis.	2011	No End Date (Continuous)
IT power management					
Install power management software which shuts down computers outside of regular business hours	Not Yet Evaluated				No End Date (Continuous)
Implement server virtualization	Ongoing/In Progress	At the end of the year over 2100 servers had been virtualized -- 98% of the centrally-managed campus total.	Continue to implement server virtualization. 99% of servers will be virtualized by 2013. A very small number of systems may require to stay on physical servers - for that reason UBC will not be 100%	2009	No End Date (Continuous)

University of BC - Vancouver Campus - 2012 Carbon Neutral Action Report

Actions Towards Carbon Neutrality

The actions listed below contribute to a reduction in greenhouse gas emissions from sources for which public sector organizations are responsible under the carbon neutral government regulation of the Greenhouse Gas Reduction Targets Act.

Action	Status	Steps Taken	Steps Planned	Start Year	End Year
			virtual until those systems are decommissioned.		
Apply auto-sleep settings on computer monitors and CPUs	Not Yet Evaluated				No End Date (Continuous)
Remove stand-alone printers, copiers, and/or fax machines and install multi-function devices as part of a print management strategy	Ongoing/In Progress	Xerox has been actively providing assessments for UBC departments and replacing older printing equipment with multi-function devices where requested by clients.	Search and identify printers that can be replaced with the Xerox solution and make recommendations to clients where applicable.	2009	No End Date (Continuous)
Apply auto-sleep settings on printers, fax machines, and/or multi-function devices	Ongoing/In Progress	All Xerox devices being installed have two-stage power-saving features enabled by default (from standby to low power and from low power to sleep).	Actively engage clients and recommend switch to Xerox, where applicable. Ensure supported non-Xerox devices have power-saving enabled.	2009	No End Date (Continuous)
Replace computers with ENERGY STAR models during regular computer upgrades	Ongoing/In Progress	All computer replacement requests are provided with Dell Optiplex 3010 desktops, which are Energy Star 5.2 compliant.	Continue regular replacement of older PCs with Energy Star models such as Optiplex 3010, where applicable. Identify desktop computers that have potential to be replaced with VDI zero clients - which consume less power than even the most efficient PC - and recommend that clients switch to VDI where applicable.	2008	No End Date (Continuous)
Other Stationary Fuel Combustion					
Develop and implement UBC-specific standards for implementing LEED Gold	Ongoing/In Progress	UBC's LEED Implementation Guide was used by design teams to optimize the LEED process for the campus and help UBC achieve its sustainability targets. The guide outlines which credits are considered mandatory requirements or recommended by UBC, including energy performance of 42% below MNECB.	Continue to require design teams to follow the Guide. Final LEED scorecards and certification results for all completed projects will be collected to verify that UBC requirements and recommendations are achieved.	2009	No End Date (Continuous)
Develop Energy Density Targets for new construction and major renovations, as per UBC Climate Action Plan	Ongoing/In Progress	Developed a new tool to specify Energy Density Targets for new construction, major renovations, and existing buildings. The tool accounts for different ratios of electricity versus fossil fuel. Customized targets were generated for use by design teams on new buildings.	Continue to specify absolute energy targets for all new construction and major renovation, in addition to the relative performance requirements of LEED.	2010	No End Date (Continuous)
Use UBC's Residential Environmental Assessment Program for Green Building Certification of residential buildings owned by UBC Properties Trust	Ongoing/In Progress	REAP Gold is required for all new developments. Applied REAP to a student residence at UBC's Okanagan campus as well as faculty and staff housing at UBC's Vancouver campus.	Update REAP rating system with new energy performance requirements and district energy compatibility.	2008	No End Date (Continuous)
Develop Green Labs program to reduce energy use in laboratories	Ongoing/In Progress	Pilot projects to retrofit laboratory fume hoods began implementation in 2012. The Shut the Sash competition in three buildings resulted in 85% reduction in fume hood energy use.	Retrofit pilot projects will be completed and will inform a campus-wide retrofit program. The Shut the Sash competition will be repeated in 2013.	2011	No End Date (Continuous)
Upgrade utilities infrastructure to improve efficiency	Ongoing/In Progress	Completed Phases 2 and 3 of one of the largest steam to hot water conversions in North America.	The hot water system will heat 130 buildings on campus upon completion in 2017. Due to much lower distribution losses with hot water compared to steam, the project will reduce UBC's energy use by 24 percent and GHG emissions by 22 percent, saving \$4 million in operating and energy costs annually.	2011	No End Date (Continuous)
Build net-zero buildings	Ongoing/In Progress	Research projects were conducted on the Centre for Interactive Research on Sustainability (CIRS), a regenerative building that is net-zero in energy, GHG emissions and water.	Conduct research projects on the CIRS building.	2011	No End Date (Continuous)
Install an on-site renewable energy demonstration project	Ongoing/In Progress	UBC's Bioenergy Research and Demonstration Facility, the first commercial-scale demonstration of biomass gasification co-generation in North America, began operation in 2012.	The Bioenergy Research and Demonstration Facility will reduce campus GHG emissions by 9 percent. This innovative research platform will yield valuable new knowledge in the clean energy sector.	2008	No End Date (Continuous)
Replace computers with virtual desktops	Ongoing/In Progress	In 2012, 400 virtual desktops were rolled out, bringing the total	Continue to identify additional computers that can be replaced with	2010	No End Date

University of BC - Vancouver Campus - 2012 Carbon Neutral Action Report

Actions Towards Carbon Neutrality					
The actions listed below contribute to a reduction in greenhouse gas emissions from sources for which public sector organizations are responsible under the carbon neutral government regulation of the Greenhouse Gas Reduction Targets Act.					
Action	Status	Steps Taken	Steps Planned	Start Year	End Year
	Progress	number of virtual desktops in use to 1200.	VDI zero clients which have lower power consumption and make preparations for replacement.		(Continuous)
Owned buildings					
Establish energy performance baseline for owned buildings	Ongoing/In Progress	Energy performance baselines were developed for remaining buildings in the Continuous Optimization program. A Monitoring, Targeting and Reporting system is being implemented.	Weather-adjusted energy performance baselines will be developed for all additional buildings connected to the real-time metering system.	2008	No End Date (Continuous)
Register for performance labelling/certification for operations and maintenance of owned buildings (e.g., LEED EB:O&M)	Ongoing/In Progress	On hold until results of Continuous Optimization can inform this action.	Review the BOMA pilot when Continuous Optimization implementation is complete, to determine whether it would be advantageous to pursue certification on more buildings as part of Continuous Optimization program.	2009	No End Date (Continuous)
Achieve LEED NC Gold certification at a minimum for new construction or major renovations	Ongoing/In Progress	Construction was completed on three buildings awaiting LEED certification: Bioenergy Research and Demonstration Facility, Earth Science Building and Pharmaceutical Science/Centre for Drug Research and Development. LEED Gold certification was awarded for Buchanan Complex - Renew.	All new construction and major renovations will achieve a minimum of LEED Gold. Six additional projects will reach completion between 2013 and 2015: Djavad Mowfaghian Centre for Brain Health, Ponderosa Commons Phase 1 and Phase 2, New Student Union Building (targeting LEED Platinum and the Living Building Challenge), Engineering Student Centre, Alumni Centre.	2008	No End Date (Continuous)
Perform energy retrofits on existing, owned buildings	Ongoing/In Progress	Retrocommissioning complete or nearly complete for the 17 buildings in Phase 1 of the Continuous Optimization program.	Retrocommissioning will be conducted on a total of 70 buildings as part of the Continuous Optimization program.	2008	No End Date (Continuous)
Incorporate a refrigerant management strategy into regular building management/maintenance to reduce fugitive emissions	Not Yet Evaluated				No End Date (Continuous)
Planning/management					
Reduce office space (square meters) per employee	Ongoing/In Progress	Space is allocated at or below the BCUSS allocation based on total FTEs when space is requested and new buildings or renovations are programmed.	Continued allocation within BCUSS guidelines and intensification of space use.	2008	No End Date (Continuous)
Install a real time metering system (e.g. Pulse, Reliable Controls, Houle Controls)	Ongoing/In Progress	All major buildings are connected to the ION meter network. Six athletics facilities were added to the ION meter network bringing the total to 110 buildings with real-time metering. Of these, 64 are connected to the Pulse EMIS.	All newly constructed buildings will be connected to the metering system.	2008	No End Date (Continuous)
Retrofit details for owned buildings					
Upgrade mechanical systems (heating, cooling, ventilation) during retrofits	Ongoing/In Progress	Building Operations developed a prioritized list of mechanical systems to be upgraded.	Continue to upgrade older buildings instead of demolishing them through UBC Renew, which will include HVAC upgrades.	2008	No End Date (Continuous)
Upgrade lighting systems during retrofits	Ongoing/In Progress	Completed a new indoor lighting strategy that specifies standardized products, controls and maintenance.	A pilot lighting retrofit project will be completed in a representative building to inform a future campus-wide lighting retrofit program.	2008	No End Date (Continuous)
Upgrade/adjust control systems during retrofits	Ongoing/In Progress	Control system adjustments and upgrades were identified in the audits completed for buildings in the Continuous Optimization program.	Control system adjustments will be conducted on 70 buildings as part of the Continuous Optimization program.	2008	No End Date (Continuous)
Improve building insulation (including windows) during retrofits	Not Yet Evaluated				No End Date (Continuous)
Supplies (Paper)					
Behaviour change program					
Train staff to use collaborative software for electronic editing (e.g. SharePoint, Groove, etc.)	Not Yet Evaluated				No End Date (Continuous)
Encourage staff to hold paperless meetings or presentations (i.e., no handouts)	Ongoing/In Progress	Continued promotion of Sustainable Purchasing Guide which promotes paperless meetings/events and offers strategies to do so.	Development and implementation of a multi-year comprehensive Sustainability Engagement Strategy.	2009	No End Date (Continuous)

University of BC - Vancouver Campus - 2012 Carbon Neutral Action Report

Actions Towards Carbon Neutrality

The actions listed below contribute to a reduction in greenhouse gas emissions from sources for which public sector organizations are responsible under the carbon neutral government regulation of the Greenhouse Gas Reduction Targets Act.

Action	Status	Steps Taken	Steps Planned	Start Year	End Year
Electronic media in place of paper					
Install collaborative software for electronic editing (e.g. SharePoint, Groove, etc.)	Ongoing/In Progress	Survey and focus groups conducted with staff and faculty members from across the UBC campus to help understand the demand for SharePoint and identify the key content and communication requirements.	UBC IT will be offering Microsoft SharePoint software service to all clients in summer 2013. This web-based platform provides a secure option for communication, collaboration, and document storage among teams and user communities.	2012	No End Date (Continuous)
Use electronic document library for filing common documents	Not Yet Evaluated				No End Date (Continuous)
Switch to an electronic payroll notification system in place of paper pay stubs	Completed (in Previous Year)				No End Date (Continuous)
Paper Type					
Purchase 30% post-consumer recycled paper	Ongoing/In Progress	In 2012, 97% of purchases through preferred supplier Unisource contained 30% post-consumer recycled (PCR) content or better. When direct purchases through Grand & Toy, Staples, and XGS are included, 82% of total university paper purchases contain 30% post-consumer recycled content or better. Selected new preferred paper supplier (Grand & Toy) and negotiated better pricing for 50% PCR paper (to be cheaper than previously offered 30% PCR paper with previous supplier). Developed a custom UBC site for ordering that highlights 30%, 50% & 100% PCR paper options. Virgin paper eliminated as an option on the custom site and is priced more expensive than 30-100% PCR paper. G&T will also be adding the option of wheat paper to our custom list as a tree free paper alternative (recommendation from our 2012 SEEDS project).	Continue to promote 50% post-consumer recycled content paper. Investigate use of sugar cane paper through SEEDS project as another potential alternative paper source.	2008	No End Date (Continuous)
Purchase 40% post-consumer recycled paper	Ongoing/In Progress	See above.	See above.	2008	No End Date (Continuous)
Purchase 100% post-consumer recycled paper	Ongoing/In Progress	See above.	See above.	2008	No End Date (Continuous)
Printer/document settings					
Switch networked printers and photocopiers to automatic double-sided	Not Yet Evaluated				No End Date (Continuous)

University of BC - Vancouver Campus - 2012 Carbon Neutral Action Report

Actions to Reduce Provincial Emissions and Improve Sustainability

The actions listed below contribute to a reduction in greenhouse gas emissions from sources that fall outside of the reporting requirements defined in the carbon neutral government regulation of the Greenhouse Gas Reduction Targets Act. Public sector

Action	Status	Steps Taken	Steps Planned	Start Year	End Year
Business Travel					
Behaviour change program					
Train staff in web-conferencing	Not Yet Evaluated				No End Date (Continuous)
Encourage staff to consider virtual attendance/presentation at events where possible	Not Yet Evaluated				No End Date (Continuous)
Encourage carpooling to meetings	Ongoing/In Progress	Continued to encourage carpooling to meetings through use of carsharing on campus (Zipcar, Modo, Car2Go). Added additional Car2Go dedicated parking locations on campus. service on-campus. Experimented with 'Skwez' ridesharing tool to encourage carpooling to UBC Athletics events.	Continue to promote existing options for carpooling / vanpooling.	2008	No End Date (Continuous)
Encourage alternative travel to meetings (e.g., bicycles, public transit, walking)	Ongoing/In Progress	Continued promotion of alternatives to SOV (Employer Pass Program, Upass, cycling, campus shuttles, pedestrian oriented campus, carsharing). Developed a revised community shuttle route in conjunction with TransLink that better connects key destinations on campus. Continued work with key partners on promoting advancement of rapid transit connection along Broadway corridor to UBC.	Implementation of revised community shuttle route. Continue to invest in end of trip facilities to support cycling on campus, dedicated parking spaces for carshare vehicles. Continue to explore options for improving transit service to UBC, including promotion of rapid transit option. Renewed U-Pass BC contract with TransLink to provide mandatory bus pass to all students. Continued improvements to the public realm in support of a more walkable community. Transportation Plan process focused on improving on-campus travel.	2008	No End Date (Continuous)
Policy and budgeting					
Create a low-carbon travel policy or travel reduction goal	In Development	An updated Travel and Related Expenses Policy 83 was drafted, to be completed in early 2013, when it will be launched at the same time as the new travel and expense payment process.	Investigate best practices of other universities' green travel activities. Continue to develop a managed meeting and event program for UBC conference activities in Vancouver with a focus on greener options.	2009	No End Date (Continuous)
Virtual meeting technology					
Install web-conferencing software (e.g., Live Meeting, Elluminate, etc.)	Ongoing/In Progress	Now have campus-wide license for ¿Blackboard Collaborate¿, software that allows external web-conferencing sessions to be organized independent of courses, which is ideal for meetings and seminars that may include participants outside of UBC.	Promote availability and use of Blackboard Collaborate for web-conferencing.	2012	No End Date (Continuous)
Make desktop web-cameras available to staff	Not Yet Evaluated				No End Date (Continuous)
Install video-conferencing units in meeting rooms or provide mobile video-conferencing units	Ongoing/In Progress	Upgraded 10 meeting rooms and classrooms to include full video-conferencing units. Now have campus-wide license for ¿BlueJeans¿ video-conferencing software, which allows multi-point conferences that can connect participants using different protocols and devices, including video-conferencing systems and software, Skype, telephone, and Microsoft Lync/Communicator.	Promote availability and use of BlueJeans for video-conferencing.	2010	No End Date (Continuous)
Education, Awareness, and Engagement					
Awards/Recognition					
Establish a sustainability/green awards or recognition program	Ongoing/In Progress	Over 100 staff, senior management, students and faculty attended the annual Sustainability Appreciation Luncheon to recognize and celebrate staff, student and faculty efforts in the Sustainability Coordinator and SEEDS Programs.	Ongoing hosting of annual sustainability appreciation event.	2008	No End Date (Continuous)
Other Education, Awareness, and Engage					

University of BC - Vancouver Campus - 2012 Carbon Neutral Action Report

Actions to Reduce Provincial Emissions and Improve Sustainability

The actions listed below contribute to a reduction in greenhouse gas emissions from sources that fall outside of the reporting requirements defined in the carbon neutral government regulation of the Greenhouse Gas Reduction Targets Act. Public sector

Action	Status	Steps Taken	Steps Planned	Start Year	End Year
Offer and promote sustainability learning opportunities through undergraduate, graduate, and continuing studies academic programs	Ongoing/In Progress	<p>UBC offers more than 550 courses at the undergraduate and graduate level that address environmental, social and techno-economic aspects of sustainability in over 50 subjects. Comprehensive sustainability course listing online.</p> <p>UBC offers more than 40 undergraduate, graduate and professional programs that allow students to orient their degree on a sustainability subject area.</p> <p>The UBC Continuing Studies Centre for Sustainability (CSCS) offers over 17 sustainability courses and 3 certificate programs to the wider community.</p> <p>In September 2012, UBC launched the Sustainability Ambassador Program, a new student peer-to-peer program which recruited 9 undergraduate students from across UBC's faculties to promote sustainability education on campus.</p>	Continue to offer and promote sustainability learning opportunities through undergraduate, graduate, and continuing studies academic programs.	2008	No End Date (Continuous)
Develop and promote the Shut the Sash Fumehood Energy Conservation Campaign	Ongoing/In Progress	<p>Campus Sustainability partnered with BC Hydro and FortisBC in Shut the Sash, an energy-saving and education campaign focusing on fume hoods. The campaign was launched in 3 lab buildings on campus and concentrated on the two hundred or so Variable Air Volume (VAV) fume hoods in these buildings, which have sliding fronts that control the air flow.</p> <p>More than 70 percent of the targeted groups chose to participate. Over the six weeks of the competition, monitors recorded an 82 percent improvement in sash closures. As a result, the labs saved the equivalent amount of electricity consumed by 32 homes.</p>	Launch and wrap-up of the 2nd annual Shut the Sash energy conservation campaign. Results will be reported in May 2013.	2011	No End Date (Continuous)
Advance sustainability in campus operations by coordinating and supporting partnerships between staff, faculty and students via the SEEDS Program	Ongoing/In Progress	The SEEDS (Social, Ecological, Economic, Development Studies) program engaged over 480 student, staff and faculty participants in the 2012/13 academic year, resulting in over 75 projects and 119 student reports related to campus operational sustainability topics. The outcomes of many of these reports will be implemented or affect the decision-making of staff related to sustainability at UBC.	<p>Ongoing coordination of SEEDS program to engage students, staff, and faculty in sustainability research and projects on campus.</p> <p>Enhancement of the SEEDS Program through a strategic program plan.</p>	2008	No End Date (Continuous)
Increase student engagement in energy conservation initiatives in residences	Ongoing/In Progress	UBC coordinate the 3rd annual Do It in the Dark energy and water conservation competition, which reached over 3,100 first year students in Totem Park and Place Vanier residences with energy and water conservation messaging and tips. A real-time energy monitoring dashboard tracked building-level energy use in Totem Park residence. Students in the winning house, Haida House, reduced their energy use by 30% compared with a two-week baseline. Other initiatives included promotion of cold-water washing, shorter showers with shower timers from FortisBC, "Dine in the Dark" lights off campaign in the residence dining halls, energy conservation booths, commitment photos and a Twitter campaign.	<p>Launch energy conservation 'maintenance' pilot program in two metered residence houses in Totem Park, with the focus on four high impact behaviours: lights out, power management, cold water washing and shorter showers.</p> <p>Continue to roll out the Do it in the Dark energy conservation competition in UBC's two first year residences. Explore opportunity to enhance building-level metering.</p> <p>Develop year-round energy and water conservation program in the two first year residences determined by pilot outcomes through the</p>	2008	No End Date (Continuous)

University of BC - Vancouver Campus - 2012 Carbon Neutral Action Report

Actions to Reduce Provincial Emissions and Improve Sustainability

The actions listed below contribute to a reduction in greenhouse gas emissions from sources that fall outside of the reporting requirements defined in the carbon neutral government regulation of the Greenhouse Gas Reduction Targets Act. Public sector

Action	Status	Steps Taken	Steps Planned	Start Year	End Year
			Campus Sustainability Engagement Strategy.		
Increase student engagement in operational sustainability by supporting Common Energy UBC, UBC's largest student-run sustainability organization.	Ongoing/In Progress	Supported Common Energy UBC (http://commonenergyubc.wordpress.com/) by offering one paid internship position through Campus Sustainability for UBC campus outreach activities on climate action and sustainability. In the 2012/13 academic year, Common Energy held 20 events at UBC with a total attendance of 1765 participants, had 60 active student volunteers and coordinated initiatives such as the Bottle Water Free UBC petition and Earth Hour.	Continue to partner with UBC Common Energy on campus sustainability outreach campaigns and projects.	2008	No End Date (Continuous)
Provide sustainability education during new student orientations	Ongoing/In Progress	Annual outreach about sustainability to new students at UBC's annual new student orientation events including Imagine UBC, Gala and Jumpstart. The UBC Eco-Team continued to support sustainability awareness at the Imagine UBC orientation event. Listing of sustainability-oriented student groups and volunteer opportunities to help students find relevant co-curricular opportunities: http://sustain.ubc.ca/teaching-learning/beyond-classroom .	Continue to provide sustainability education during new student orientations.	2008	No End Date (Continuous)
Support faculty to incorporate sustainability into academic programs, courses and initiatives	Ongoing/In Progress	The USI Teaching & Learning Fellowship Program annually brings together 6 outstanding UBC faculty members who are leaders in sustainability education to share ideas and advance sustainability curricula on campus. http://sustain.ubc.ca/teaching-learning/fellowship-program . 6 Sustainability Education e-newsletters sent out bi-monthly to over 790 campus community members. The USI Spotlight Program awarded 4 grants to UBC instructors to expand, revise and/or retool existing courses and increase their relevance to sustainability issues and accessibility to UBC students. http://sustain.ubc.ca/teaching-learning/support-educators/teaching-learning-office-initiatives . The USI Teaching & Learning Office actively engages with departments and faculties campus-wide to promote the 4 UBC student sustainability attributes and catalyse the development of "sustainability learning pathways" (developed in 2011). See http://sustain.ubc.ca/sites/sustain.ubc.ca/files/uploads/pdfs/Sustainability%20Attribut	Continue to consult with faculties and departments on sustainability attributes and pathways. Continue the Fellowship and Spotlight Programs.	2008	No End Date (Continuous)
Develop comprehensive Sustainability Engagement Strategy	In Development	Began development of a Campus Sustainability Engagement and Social Marketing Strategy, which will target energy conservation across offices, labs and student residences across campus. Work in 2012 including analysis to determine high impact behaviours in energy, water and waste in offices, labs and residences, best practice analysis for each campus environment and development of energy conservation pilots for labs and residences.	Launch of energy conservation pilots in laboratories and student residences. The high impact behaviours in labs will focus on upgrading, defrosting, cleaning and maintaining electrical equipment such as freezers and refrigerators.	2011	No End Date (Continuous)

University of BC - Vancouver Campus - 2012 Carbon Neutral Action Report

Actions to Reduce Provincial Emissions and Improve Sustainability					
The actions listed below contribute to a reduction in greenhouse gas emissions from sources that fall outside of the reporting requirements defined in the carbon neutral government regulation of the Greenhouse Gas Reduction Targets Act. Public sector					
Action	Status	Steps Taken	Steps Planned	Start Year	End Year
Staff Professional Development					
Support green professional development (e.g., workshops, conferences, training)	Ongoing/In Progress	9 educational and networking events offered to UBC staff through the Sustainability Coordinator Program.	Ongoing educational events offered to staff Sustainability Coordinators.	2008	No End Date (Continuous)
Include green options in employee performance measurement system	Not Yet Evaluated				No End Date (Continuous)
Staff awareness/education					
Provide education to staff about the science of climate change	Ongoing/In Progress	<p>Various academic departments, including The Pacific Institute for Climate Solutions (PICS) and the Institute of Resources, Environment and Sustainability (IRES), regularly host public lecture series available to staff on various sustainability related subjects, including lectures on climate change.</p> <p>Ongoing tuition fee waiver available for staff can be used to enroll in undergraduate and continuing studies courses, some of which include climate change science.</p> <p>UBC Reads Sustainability features leading authors on sustainability topics to engage in campus-wide discussions on sustainability: http://ubcreadssustainability.com/about-ubc-reads-sustainability.</p>	Continued lectures and course offerings on climate change science.	2008	No End Date (Continuous)
Provide education to staff about the conservation of water, energy, and raw materials	Ongoing/In Progress	<p>9 events held in 2012 on waste reduction, green event planning, sustainable food systems, Fair Trade, and transportation alternatives.</p> <p>Ongoing promotion of online toolkits which educate staff on energy conservation, GHG reduction, zero waste and alternative transportation.</p>	Ongoing educational events for Sustainability Coordinators. Ongoing promotion of online toolkits.	2008	No End Date (Continuous)
Provide green tips on staff website or in newsletters	Ongoing/In Progress	<p>12 Campus and Community Planning monthly newsletters sent to students, staff, faculty and residents, providing updates, tips and links to events and resources on sustainability issues in planning and design, energy, waste, water and transportation.</p> <p>Quarterly Green Research e-newsletters published through Risk Management Services providing green research information to UBC faculty and staff.</p> <p>The UBC Sustainability Initiative Twitter account sends out short timely newsbites, tips and resources to over 5,500 followers.</p>	Ongoing distribution of newsletters and active social media promotion.	2008	No End Date (Continuous)
Provide sustainability education during new staff orientation	Ongoing/In Progress	<p>Booth with sustainability materials and resources, including the Employee Sustainability Guide, offered at quarterly new staff and faculty orientation.</p> <p>Promotion of recycling and composting and proper waste sorting at annual Welcome Back BBQ reaching 4000+ staff in September 2012. 16 staff volunteers stood by zero waste stations educating their peers how to use UBC's waste streams.</p>	Continued participation in quarterly new staff orientation. Continued promotion of zero waste behaviours at annual Welcome Back BBQ to UBC staff.	2008	No End Date (Continuous)
Team-building					

University of BC - Vancouver Campus - 2012 Carbon Neutral Action Report

Actions to Reduce Provincial Emissions and Improve Sustainability

The actions listed below contribute to a reduction in greenhouse gas emissions from sources that fall outside of the reporting requirements defined in the carbon neutral government regulation of the Greenhouse Gas Reduction Targets Act. Public sector

Action	Status	Steps Taken	Steps Planned	Start Year	End Year
Create Green, Sustainability, Energy Conservation, or Climate Action Teams with executive endorsement	Ongoing/In Progress	<p>The Sustainability Coordinator (SC) Program engaged 80+ staff with opportunities and resources to promote and implement sustainable practices in their unit. SCs use 2-4 hours per month of paid staff time approved by the Board of Governors in 1999.</p> <p>The Sustainability in Residence program continued to mobilize students to reduce water, waste, and energy consumption in residences and to build a culture of sustainability by training and supporting 27 Residence Sustainability Committee members.</p> <p>The UBC Climate Action Plan Working Groups (Development and Infrastructure, Energy Supply and Management, Fleet, Transportation (Commuting), Business Travel and Procurement, and Food) involve over 40 staff campus-wide to implement the Plan, approved by the Board of Governors in 2010.</p>	<p>Finalization of the Sustainability Coordinator Program strategic plan, which will have a focus on increased recruitment and revitalized executive endorsement for this program. The program format may also shift to include the sponsorship and promotion of sustainability committees within UBC buildings, alongside recruitment of individual staff sustainability coordinators at the unit level.</p> <p>Ongoing support for committee members and staff sustainability coordinators.</p>	2008	No End Date (Continuous)
Provide resources and/or dedicated staff to support teams	Ongoing/In Progress	Development of Campus Sustainability Engagement Strategy, which, when complete in 2013-14, will produce new conservation materials for office staff, lab users and residence students.	Implementation of pilot programs on energy conservation in Totem Park student residence and selected labs, both which involve the development and dissemination of engagement materials and resources. Completion and implementation of the Campus Sustainability Engagement Strategy.	2008	No End Date (Continuous)
Providing behaviour change education/training to teams (e.g., community-based social marketing)	Ongoing/In Progress	<p>Training for 15 new staff Sustainability Coordinators held in February 2012. The training educates Sustainability Coordinators about energy conservation, zero waste, sustainable purchasing and sustainable transportation choices as well as principles of community based social marketing and engagement strategies.</p> <p>Hosted two Personal and Professional Development Program sustainability workshop for Residence Coordinators and Residence Advisors - one workshop on sustainability behaviour change and another on waste reduction.</p>	Ongoing training for new staff Sustainability Coordinators and for Residence Coordinators and Advisors.	2008	No End Date (Continuous)
Other Sustainability Actions					
Adaptation to Climate Change					
Assessed whether extreme weather events and/or long term changes in climate will affect the organization's business areas	In Development	UBC Campus + Community Planning is developing an Integrated Stormwater Management Plan which will outline recommendations for effective stormwater management to help UBC become more resilient to storm-related events.	Complete the Integrated Stormwater Management Plan. Consult with the public and stakeholders regarding the plan. Provide the Board of Governors with recommendation for development guidelines for the campus.	2008	No End Date (Continuous)
Integrated considerations of extreme weather events and/or long term changes in climate into the organization's decision making.	In Development	UBC Campus + Community Planning is developing an Integrated Stormwater Management Plan which will outline recommendations for effective stormwater management to help UBC become more resilient to storm-related events.	Complete the Integrated Stormwater Management Plan. Consult with the public and stakeholders regarding the plan. Provide the Board of Governors with recommendation for development guidelines for the campus.	2008	No End Date (Continuous)
Building construction, renovation					
Establish a policy to reuse materials where possible and divert construction and demolition debris from landfills and incineration facilities	Ongoing/In Progress	The draft Zero Waste Action Plan includes a set of strategies for construction waste. Additional consultations with stakeholders on construction and demolition waste have been undertaken.	Develop improved methods for construction and demolition waste data collection, and implement strategies to increase waste management best practices in construction and renovation projects. Explore the potential to reduce construction and demolition waste	2008	No End Date (Continuous)

University of BC - Vancouver Campus - 2012 Carbon Neutral Action Report

Actions to Reduce Provincial Emissions and Improve Sustainability

The actions listed below contribute to a reduction in greenhouse gas emissions from sources that fall outside of the reporting requirements defined in the carbon neutral government regulation of the Greenhouse Gas Reduction Targets Act. Public sector

Action	Status	Steps Taken	Steps Planned	Start Year	End Year
			through focusing on building renewal and space optimization.		
Incorporate lifecycle costing into new construction or renovations	Ongoing/In Progress	Continued use of lifecycle costing in all new construction and major renovation projects.	Continue to use lifecycle costing for all new construction and major renovation projects.	2008	No End Date (Continuous)
Commuting to and from home					
Introduce telework/work from home policy	Ongoing/In Progress	Continued to provide telecommuting and work from home guidelines for Management & Professional (M&P) staff. http://www.hr.ubc.ca/faculty-staff-resources/telecommuting/ .	Continue to provide telecommuting and work from home guidelines for Management & Professional (M&P) staff.	2009	No End Date (Continuous)
Offer staff a compressed work week	Ongoing/In Progress	Continued to provide flexibility in UBC collective agreements to allow for compressed work weeks where it is operationally feasible.	Continue to provide flexibility in UBC collective agreements to allow for compressed work weeks where it is operationally feasible.	2008	No End Date (Continuous)
Encourage commuting by foot, bicycle, carpool or public transit	Ongoing/In Progress	72% of campus users commute by foot, bicycle, carpool, or public transportation. Ongoing investments in end of trip facilities, including bike lockers, bike racks, and secure bike storage rooms. Continued implementation of campus pedestrianization plan to restrict vehicular access and create a pedestrian priority zone in the academic core. Supported spring and fall Bike to Work Week. Work with key stakeholders on promotion of rapid transit connection to UBC via Broadway corridor.	Continue development of secure bicycle parking facilities and investments in end of trip facilities. Continued work with external agencies and key stakeholders on promotion of rapid transit connection to UBC via Broadway Corridor. Continue support of engagement programs (Bike to Work Week, UBC Bike Pledge). Renegotiate Upass BC contract with TransLink/ Province to extend program to 2016. Revise TransLink community shuttle program to improve service to key destinations on campus. Transportation Plan development to address on-campus circulation and access.	2008	No End Date (Continuous)
Provide shower or locker facilities for staff/students who commute by foot or by bicycle	Ongoing/In Progress	Examined campus development projects for compliance with Vancouver Campus Plan (VCP) Design Guidelines, which specify quantity of lockers/ showers required in new developments. Provided in-kind support to departments or units interested in developing end-of-trip facilities in their buildings. Provided gear lockers in secure bike parking projects.	Continue to benchmark projects against Vancouver Campus Plan Design Guidelines to ensure adequate end of trip facilities are included in all new developments.	2008	No End Date (Continuous)
Provide secure bicycle storage	Ongoing/In Progress	In 2012 UBC had 1282 registered secure bike parking users. Completed construction of Chemistry Secure Bike Parking Facility increasing secure bike parking by 58 spaces. Purchased additional bicycle lockers to be implemented in 2013.	Construction of additional secure bike parking areas, including racks, lockers, and secure bike storage rooms.	2008	No End Date (Continuous)
Other Sustainability Actions					
Expand preferred vendor agreements that advance sustainability	Ongoing/In Progress	UBC BuySmart was launched and in addition to providing a list of preferred & pre-qualified suppliers, it indicates our sustainable partners with a leaf icon. Our sustainable partners will be suppliers who work directly with Payment and Procurement Services and align with Place and Promise and UBC's Climate Action Plan. They also complete an annual 'UBC Supplier Sustainability Scorecard' which will eventually have all suppliers who are listed as sustainable partners fill out.	Ongoing promotion of UBC BuySmart and addition of new suppliers so campus has a robust and evolving list of suppliers that meet our Supplier Code of Conduct. We will also be increasing our supplier participation in our annual UBC Supplier Sustainability Scorecard. Currently sent out to 14 vendors but will be sending to all sustainable partners listed on UBC BuySmart this spring/summer.	2010	No End Date (Continuous)
Implement Styrofoam Reduction and Recycling Pilot	Ongoing/In Progress	1,133 Styrofoam containing bags were recycled from 18 campus buildings during 2012 with an estimated total volume of 124,630 L. More information available at: http://riskmanagement.ubc.ca/environment/styrofoam .	UBC will continue to expand the Styrofoam recycling program to other buildings on campus. Work with vendors to reduce use of Styrofoam.	2011	No End Date (Continuous)
Implement Soft Plastic Recycling Pilot	Ongoing/In Progress	Five buildings on-campus are recycling Soft Plastic via a pilot program which started in September 2012. Approximately 5,250 L of soft plastics have been diverted from the landfill through this program. More information available at: http://riskmanagement.ubc.ca/environment/soft-plastic-recycling .	UBC is planning to expand the soft plastic recycling pilot on campus and will continue to expand hard lab plastic recycling.	2012	No End Date (Continuous)

University of BC - Vancouver Campus - 2012 Carbon Neutral Action Report

Actions to Reduce Provincial Emissions and Improve Sustainability					
The actions listed below contribute to a reduction in greenhouse gas emissions from sources that fall outside of the reporting requirements defined in the carbon neutral government regulation of the Greenhouse Gas Reduction Targets Act. Public sector					
Action	Status	Steps Taken	Steps Planned	Start Year	End Year
Procurement (non-paper supplies)					
Incorporate minimum recycled content standards into procurement policy for consumable, non-paper supplies (e.g., writing instruments, binders, toner cartridges, etc.)	Ongoing/In Progress	UBC BuySmart was launched and provides a list of preferred/pre-qualified vendors as well as sustainable partners. Third edition of Sustainable Purchasing guide is still in the pipeline but has been on hold (collaboration with Campus Sustainability and Student Housing & Hospitality Services). Began draft of unit-level sustainability framework for Payment and Procurement Services which will look at this action.	Ongoing work with Campus Sustainability to finalize the unit-level sustainability framework for Payment and Procurement Services. This will create actions and metrics for measuring success. Communication through UBC BuySmart will be updated on an ongoing basis.	2009	No End Date (Continuous)
Establish green standards for goods that are replaced infrequently and/or may require capital funds to purchase (e.g., office furniture, carpeting, etc.)	Ongoing/In Progress	Began draft of unit-level sustainability framework for Payment and Procurement Services which will look at this action.	Ongoing work with Campus Sustainability to finalize the unit-level sustainability framework for Payment and Procurement Services. This will create actions and metrics for measuring success. Communication through UBC BuySmart will be updated on an ongoing basis.	2010	No End Date (Continuous)
Implement sustainable purchasing program for cleaning products, disposable paper products and trash bags	Ongoing/In Progress	UBC Building Operations finalized the `Green Housekeeping Program, model that encompasses a number of comprehensive green cleaning/housekeeping initiatives which are being incorporated into the everyday operations of Custodial Services. Initiatives listed at: http://www.buildingoperations.ubc.ca/custodial/custodial-initiatives/ . All buildings serviced by Custodial Services now have portion controlled, Green Seal certified, chemical dispensing units.	Continue to operate Green Housekeeping Program. Develop KPIs as part of unit-based sustainability framework planning process for UBC Building Operations.	2008	No End Date (Continuous)
Waste reduction/diversion					
Put in place an operations policy to facilitate the reduction and diversion of building occupant waste from landfills or incineration facilities	Ongoing/In Progress	Consultation on the Zero Waste Action Plan resumed in 2012, and progress was made on defining and scoping the actions. Development of a new waste reduction forecasting tool was initiated.	Complete and adopt the Zero Waste Action Plan. Implement key waste reduction and diversion initiatives including a zero waste communications & engagement strategy, recycling and food scraps pilot projects, and improving data collection systems.	2008	No End Date (Continuous)
Implement a hazardous waste reduction and disposal strategy	Ongoing/In Progress	Continued to operate comprehensive Green Research Program. Distributed 3 issues of the Green Research newsletter and held 2 Green Research events educating students, staff and faculty about green research practices and hazardous waste reduction. At UBC Vancouver campus the hazardous (chemical and biological) waste generation was reduced by almost 7 tonnes (8%) in 2012. Participation in all available recycling programs (solvents, chemicals, oil, paint, batteries, silver, lab plastic) resulted in an additional waste reduction of approximately 15.6 tonnes. More information about the Green Research Program is available at http://riskmanagement.ubc.ca/environment/green-research .	Continue to operate Green Research Program. An additional 25 tonnes will be removed annually from the hazardous waste stream, as the Ministry of Environment approved the delisting of lab-autoclaved microbiological hazardous waste in December 2012.	2008	No End Date (Continuous)
Water conservation					
Establish a water conservation strategy which includes a plan or policy for replacing water fixtures with efficient models	Ongoing/In Progress	Zero Waste and Water Engineer position filled. Scheduled completion of the Water Conservation Action Plan. Provided water efficiency targets for student housing renovations.	Complete and adopt the Water Conservation Action Plan. Improve water efficiency in student housing through renovations.	2010	No End Date (Continuous)
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	Ongoing/In Progress	Retrofit solutions for once-through cooling were investigated for three major buildings. An irrigation water efficiency study (SEEDS project) was initiated. New water efficiency provisions were added to the upcoming version of REAP, UBC's residential green building standards.	Complete and adopt the Water Conservation Action Plan. Follow through on developing and implementing solutions for buildings with high water use - e.g., retrofit of once through cooling. Launch REAP 3.0.	2010	No End Date (Continuous)

University of BC - Vancouver Campus - 2012 Carbon Neutral Action Report

Actions to Reduce Provincial Emissions and Improve Sustainability

The actions listed below contribute to a reduction in greenhouse gas emissions from sources that fall outside of the reporting requirements defined in the carbon neutral government regulation of the Greenhouse Gas Reduction Targets Act. Public sector

Action	Status	Steps Taken	Steps Planned	Start Year	End Year
Introduce a stormwater management landscape strategy (e.g., vegetated roofs, permeable paving, rain gardens, bioswales)	Ongoing/In Progress	Engaged consultants to provide review of groundwater injection as a method of dealing with stormwater and completing an updated and calibrated model of the stormwater system for planning purposes.	Complete the updated model. Complete a draft integrated stormwater management plan. Consult with the public and stakeholders regarding the plan. Provide the Board of Governors with recommendation for development guidelines for the campus.	2008	No End Date (Continuous)



2012 CARBON NEUTRAL ACTION OVERVIEW REPORT



a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

sustainability

OKANAGAN CAMPUS

ENVISIONING A SUSTAINABLE FUTURE

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 our environmental impact and embed 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.

This report was produced by the University of British Columbia's Okanagan Sustainability Office. It supplements the Carbon Neutral Action 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 leaders have contributed to the development of this report. Your ongoing commitments to sustainability, collaborative spirit and accomplishments have been instrumental to the advancement of our collective sustainability goals. We thank you for your contributions.

Facilities Management: Roger Bizzotto, Martin Gibb, Colin Richardson, Allan King

IT Services: Don Thompson, Steve Rosco, Aaron Heck

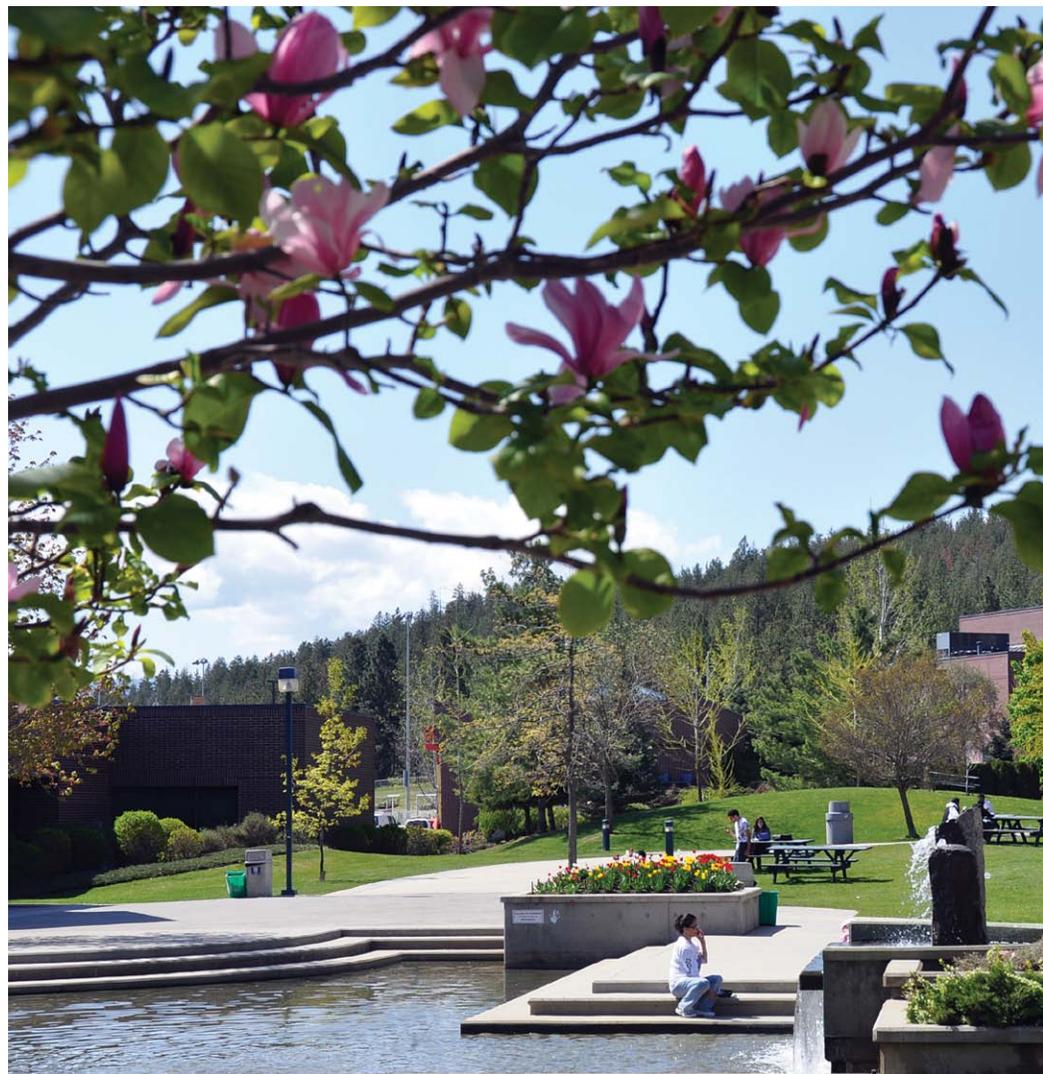
Supply Management: Denis Silva, Paula Goldspink, Dave Adel

Prepared by:

Leanne Bilodeau, Director Sustainability Operations, Okanagan Sustainability Office with the support of Anna Rankin and JoAnn Rennick Brown, Okanagan Sustainability Office

Designer: Margo Yacheshyn

University of British Columbia
Okanagan Sustainability Office
3333 University Way
Kelowna, BC V1V 1V7
www.ubc.ca/okanagan/sustainability



CONTENTS

Envisioning a Sustainable Future	2
Executive Summary	4
2012 Carbon Neutral Action Overview Report - UBC Okanagan Campus	5
2012 Greenhouse Gas Emissions	5
Offsets Applied to Become Carbon Neutral in 2012	5
Changes to Greenhouse Gas Emissions and Offsets Reporting From Previous Years	5
Overpayments to Pacific Carbon Trust	5
Emissions Reduction Activities	6
Actions Taken to Reduce Greenhouse Gas Emissions in 2012	6
Plans to Continue Reducing Greenhouse Gas Emissions 2013-2014	7
Above and Beyond: Additional Actions to Reduce Emissions and Promote a Culture of Sustainability	8
Innovation and Recognition	8
Conservation Philosophy & Practices	10
Actions Toward Carbon Neutrality (Table)	12
Campus Emissions Report	22



EXECUTIVE SUMMARY

2012 marked the first full year of campus operation since the completion of the build-out in September 2011. Despite full occupancy of the Engineering, Management and Education Building and the Reichwald Health Sciences Centre in 2012, the campus achieved an absolute reduction in building greenhouse gas emissions, reporting 3,135 tCO₂e in 2011 and 3,124 tCO₂e in 2012, respectively. This significant achievement can be attributed to a focus on green building design, the closed loop geo-exchange district energy system and ongoing operational commissioning. Overall, while the campus has increased its floor area by 95 per cent since 2007, it has improved its tCO₂e efficiency per square metre over 2007 building emission baselines by 27 per cent.

The closed loop geo-exchange district energy system achieved full operation in 2012, with the integration of original academic buildings into the loop. Serving academic buildings on campus, the system transfers heating or cooling energy from an aquifer water loop into campus distribution piping on a separate closed loop and is a significant engineering achievement toward increased utilization of renewable energy on campus. The transfer of waste heat from the administration building data centre was enabled in 2012, and optimization is ongoing.

While the campus has focused on achieving LEED® Gold standard or equivalent on new construction projects, in 2012 the campus finalized an agreement with FortisBC to optimize the performance of its original academic buildings. The three-year Building Optimization Program allows for real-time energy consumption data collection on nine buildings and retro commissioning of five original campus buildings. Through the analysis of the baseline data currently underway, the program will provide detailed recommendations to achieve 5-10 per cent energy savings through physical retrofits and controls optimization. A publicly accessible Pulse Energy Dashboard was launched in 2012 that demonstrates real time energy consumption in all nine buildings. Staff, faculty and students can log onto the dashboard at any time and observe energy consumption in nine buildings over the past week, month or three-month periods. The system also provides detailed data over longer periods for deeper analysis by Okanagan Sustainability Office and Facilities Management Teams.

In 2012, FortisBC presented PowerSense Conservation Excellence and Leadership awards to the campus for outstanding achievements in energy conservation in new construction and conservation projects. The campus received over \$200K in rebates and \$150K in annual utility savings. Lighting retrofits completed in 2012 alone will save the campus 196,000 kWh annually.

Going forward, the campus will continue to focus efforts on advancing campus operational sustainability. The Power of You, a two-year behaviour change energy reduction engagement strategy developed by the Okanagan Sustainability Office, will be deployed in 2013, initially targeting staff and faculty in academic buildings. Through collective action toward energy conservation behaviours, it is anticipated that the campus will achieve greater reduction in energy consumption over the course of the two-year program than the building optimization program could achieve alone. The Okanagan Sustainability Office will work with stakeholders to develop an operational sustainability plan to guide our actions over the coming years.



MICHAEL SHAKESPEARE
AVP Administration and Finance
University of British Columbia,
Okanagan campus



2012 GREENHOUSE GAS EMISSIONS

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

Total Emissions Calendar Year	3,317 tCO ₂ e
Buildings	3,123.5 tCO ₂ e
Mobile Combustion	45.4 tCO ₂ e
Office Supplies	75.5 tCO ₂ e
Fugitive	72.6 tCO ₂ e

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 GHG's

In-scope HFC's have been tracked by the campus since 2010. In 2012, in-scope HFC's amounted to 72.6 tCO₂e, approximately 2.2% of total emissions. Fugitive emissions over 1% are reportable and have been included in the Total Emissions Calendar Year 2012.

The Okanagan Sustainability Office, working closely with Facilities Management, remain 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 2012

Total emissions offset to become carbon neutral in 2012 as provided by SMARTTool as "total for offset" is 3316 tCO₂e. One tCO₂e reported as part of our greenhouse gas emissions profile in 2012 does not require offsets. As stated in BC Best Practices 2012 Methodology for Measuring Greenhouse Gas Emissions, the carbon dioxide emissions resulting from biogenic fuel sources must be reported but do not require offsets.

CHANGES TO GREENHOUSE GAS EMISSIONS AND OFFSETS REPORTING FROM PREVIOUS YEARS

Following the public release of the 2010 and 2011 Carbon Neutral Action Overview Report, it was determined that the total emissions and offsets applied for buildings and mobile fleet required adjustment. For 2010 calendar year offsets were under reported by 2 tCO₂e. (This is in addition to an adjustment made in 2011 for 2010 calendar year where emissions were under reported by 3 tCO₂e.) In 2011 emissions were over reported by 3 tCO₂e.

OVERPAYMENTS TO PACIFIC CARBON TRUST

The net difference of -1 tCO₂e in offsets required have been adjusted in the 2012 offset payment form and applied against the 2010 and 2011 emissions reported in SMARTTools.

EMISSIONS REDUCTIONS ACTIVITIES

ACTIONS TAKEN TO REDUCE GREENHOUSE GAS EMISSIONS IN 2012

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

A. Mobile Fuel Combustion

Adjustments from previous reporting years affected the fleet emission totals for 2010 and 2011. Adjusted amounts were 68 tCO₂e for fleet in 2010 and 53 tCO₂e for fleet in 2011. In 2012 the downward trend continued with fleet accounting for 45 t CO₂e. This is a 34% reduction in fleet emissions since 2010. Fleet comprises 2% of total emissions.

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. In 2012 one gas golf cart was replaced with electric.
- Further education on the existence and location of electrical vehicle charging stations on campus.
- Implementation of measures to reduce reliance on fleet vehicles and divert the number of trips taken by encouraging fleet carpooling, walking or cycling.

B. Stationary Fuel Combustion, Electricity and Fugitive Emissions (Buildings)

Buildings are the largest source of Green House Gas Emissions on campus. Stationary building emissions accounted for 3,124 tCO₂e in 2012. Between 2007 and 2012 energy consumption per square metre of building space dropped by 27% despite an increase in building space of 95% and student FTE increase of 81%. A focus on green-building design and infrastructure has contributed to avoidance of greenhouse gas emissions as compared to building by conventional design.

The campus's geo-exchange district energy system has been fully implemented in 2012 and is in the retro-commissioning phase of its development. In 2012, the transfer of waste heat from the administration building data centre was integrated into the loop, and optimization is ongoing. The system provides energy sharing between buildings, heat re-capture, thermal storage and flexibility for future fuel switching.

In partnership with FortisBC and Pulse Energy, UBC's Okanagan campus has initiated a three-year Building Optimization Program. The program provides real-time data to monitor energy consumption changes over days and weeks. Results of a baseline assessment will inform optimization plans and energy conservation in original academic buildings.

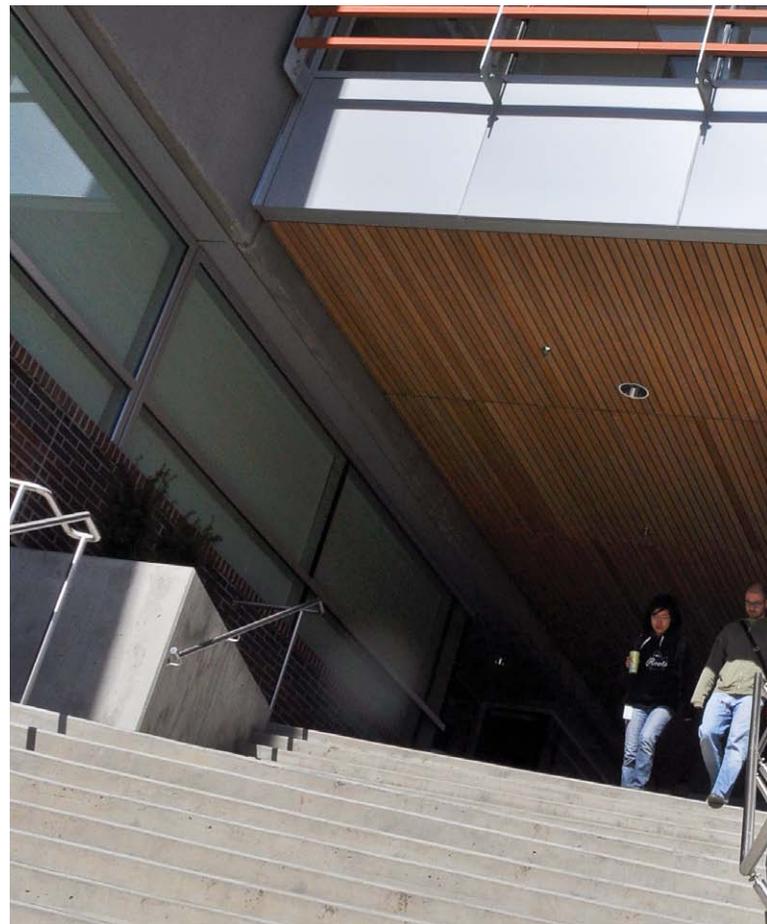
ACTIONS

- Ongoing retrofits for HVAC and occupancy sensor controls were completed on all laboratories and theatres in all existing buildings in 2012.
- Additional 3,600 T-12 ballasts changed to T-8 on campus in 2012 with a direct rebate applied to purchase cost. This retrofit saves the campus 196,000 kWh annually.
- Solar powered signage lighting was installed on all academic buildings.
- Blinds on second floor of Arts building were replaced, blocking UV light and insulating rooms.
- Successful recapture of waste heat from the Administration building data room to the Geo-exchange District Energy System.
- Launched Pulse Public Energy Dashboard to monitor consumption and provide building occupants with real time feedback.

C. Supplies (Paper)

ACTIONS

- Formation of ITPAC (Information Technology Procurement Advisory Committee); bringing together multiple IT groups from both campuses.
- Developed new T & E (Travel & Expense) Program which will reduce the need for paper requisitions.
- More than doubled the amount of units on campus under the XGS agreement since 2010 (ensures unit consolidation where applicable and end-user training of sustainable features such as double-sided print).



PLANS TO CONTINUE REDUCING GREENHOUSE GAS EMISSIONS 2013-2014



A. Mobile Fuel Combustion

- Work with transit authority to improve anti-idling practice on campus.
- Continued replacement of retired fleet vehicles with electric and energy efficient models.
- Encourage the purchase of energy efficient models where new fleet vehicles are required.
- Planned implementation of a new multi-purpose pathway/corridor to the campus in partnership with the City of Kelowna and the Ministry of Transportation and Infrastructure.

B. Stationary Fuel Combustion, Electricity and Fugitive Emissions (Buildings)

- Roll out the implementation phase of the Building Optimization Program for original campus buildings, in partnership with FortisBC. Develop energy management plans.
- Move towards reducing space to align with space standards in office areas.
- Launch a two-year behaviour-based campus engagement strategy to engage building occupants and reduce energy consumption in all academic buildings.
- Provide education to campus on Pulse Public Energy Dashboard to monitor consumption and provide building occupants with real-time feedback.
- Minimize fugitive emissions through maintenance. Plan a design review for related equipment. Determine root cause and address maintenance issues/upgrades as budget allows. Continue to monitor and report emissions.

C. Supplies (Paper)

- Continue to promote 50% post-consumer recycled paper content.
- Supplier to add the option of wheat paper to the custom list as a tree free paper alternative.



ABOVE AND BEYOND: Additional Measures to Reduce Emissions and Promote a

INNOVATION AND RECOGNITION

AWARDS

In 2012, UBC's Okanagan campus received over \$200,000 in FortisBC PowerSense rebates for leadership in energy efficient design of new construction and energy conservation measures in original facilities that will save the campus \$150,000 in annual utility costs.

Both academic and residential projects combine innovative and sustainable development technologies with a focus on energy conservation, water conservation, and sustainable construction practices. Awarded projects include the Arts and Sciences II Building, the Engineering, Management and Education Building, the Reichwald Health Sciences Centre, the Geo-Exchange District Energy System and the Gym Lighting Retrofit Project.

Additional awards and acknowledgement received in 2012 include:

- Thompson Okanagan Commercial Building Awards for Purcell Student Residences and the campus Geo-Exchange District Energy System.
- The first campus in the world to achieve Five Green Globes distinction for the Arts and Sciences II and the Charles E. Fipke Centre for Innovative Research Facilities.
- Featured profile in the SICA Construction Review, the Official Publication of the Southern Interior Construction Association.

GEO-EXCHANGE DISTRICT ENERGY SYSTEM

The campus's geo-exchange district energy system is designed to demonstrate innovation in renewable energy. It provides heating and cooling to all new academic buildings and heating to all original academic buildings on campus. A key component to reducing natural gas consumption and associated utility costs and carbon emissions, the system has been fully implemented in 2012 and is in the retro-commissioning phase of its development. In 2012, the transfer of waste heat from the administration building data centre was integrated into the loop, and optimization is ongoing. The system provides energy sharing between buildings, heat re-capture, thermal storage and flexibility for future fuel switching.

BELOW: Lorne Antle, project manager for UBC Properties Trust, Leanne Bilodeau, director of sustainability operations for the Okanagan campus, Mark Warren, FortisBC director of customer service, Michael Shakespeare, AVP Administration & Finance for the Okanagan campus, and Shelley Thomson, FortisBC energy solutions manager.



Culture of Sustainability



FEATURE AWARD-WINNING ENERGY CONSERVATION PROJECT

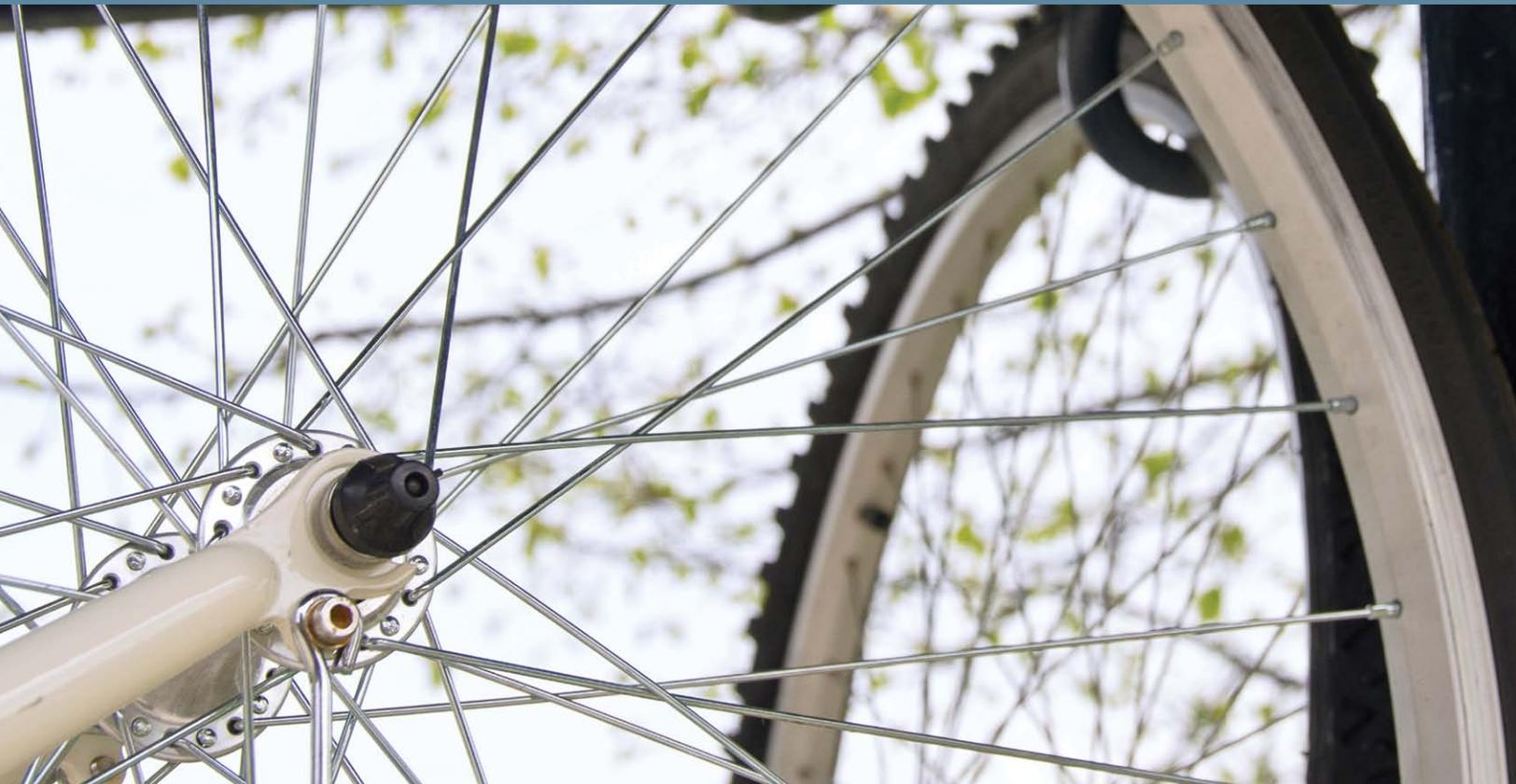
Optimizing Space Use & Energy Conservation: Gym Lighting Replacement Project

The UBC Okanagan Recreation Facility is a state-of-the-art facility that provides the venue for many provincial, national and international events. 1,560 square meters of gym floor space and 860 theatre-style bleacher seats for spectators accommodate a range of activities that include priority sporting events, convocation ceremonies and exams.

The original gym lighting system is comprised of indirect 400-watt metal halides lamps designed to minimize glare for athletes during sports tournaments and events. While providing one of the finest sports facilities in the province, an opportunity existed to consider ways to conserve energy consumption outside of its primary sports-use, while enhancing lighting and sound conditions for other uses including exam writing.

The Okanagan Sustainability Office worked with Facilities Management and FortisBC to determine the energy savings potential and return on investment to install a supplementary energy efficient lighting option in the gymnasium. 77 new high-efficient T5 fixtures were mounted underneath the existing indirect lighting system to provide brighter lights, reduced noise and reduced power consumption when the facility is not being used by athletes. The original metal halide lights are only turned on during sports tournaments when indirect lighting is needed. FortisBC awarded UBC a \$19,000 rebate, and the new system will save the campus over 234,000 kWh per year and over \$12,000 electricity costs per year. Facilities Management has subsequently completed additional lighting retrofits across the campus in 2012, which will save the campus 196,000 kWh annually.

CONSERVATION PHILOSOPHY & PRACTICES



GREENING YOUR RIDE

In 2012 an additional 15 secure bicycle storage units were added on campus to support commuting by bicycle and an additional showering facility was installed in the Administration Building. UBCycles at UBC's Okanagan campus offers short-term and long-term loans, workshops for a variety of skill levels, and tools for bike repairs. Commuters may store their bicycles in the UBCycles room and have access to day-use lockers, showers, and tools. Six electric vehicle charging stations are available on campus.

GREENING YOUR OFFICE

95 per cent of servers at UBC's Okanagan campus have been virtualized, translating to significant energy savings. In the past physical servers constantly consumed power, while running at very low utilization capacity. Virtualization dramatically improves the utilization capacity of a single server, resulting in fewer physical servers for the same workload and lower power consumption overall. 100 per cent of computers and devices such as printers, copiers and fax machines have auto sleep settings applied and computers are replaced with ENERGY STAR models during regular upgrades. IT Services has an ongoing program to replace 120V switches with 240V switches achieving 14 per cent power reduction per switch and reducing associated heat generation. All lab computers are set to automatically shut-off between 12 a.m. and 7 a.m.

GREENING YOUR ACTIONS

"Your Waste, Your Responsibility" was launched by Facilities Management in 2012 to encourage the responsibility of building occupants for emptying their own recycling and waste receptacles through the provision of large receptacles for recycled material and small containers for garbage. Small yellow composting bins have been placed in office and lunch-room areas around the campus, and with continued education efforts it is anticipated the collection of campus organic waste will continue to grow. The campus composts an average of 40,000 kg of pre-consumer organic waste annually. The high-quality compost is used to enhance soil quality on the grounds.

Allan King, manager, maintenance and grounds.



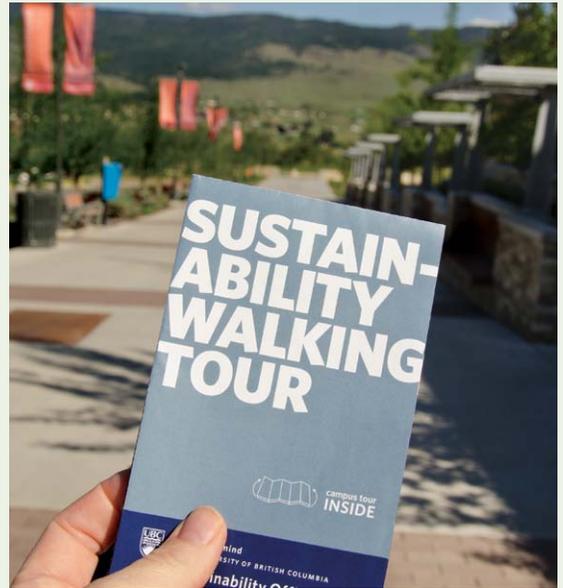
FEATURE CAMPUS ENGAGEMENT PROJECT

Walk with Us: Campus Sustainability Tour

The Campus Sustainability Tour was implemented by the Okanagan Sustainability Office to educate campus users about sustainable features of the campus. The tours support and engage the campus in sustainability learning, practice and leadership development, and demonstrate how higher education can serve as a learning space for sustainability.

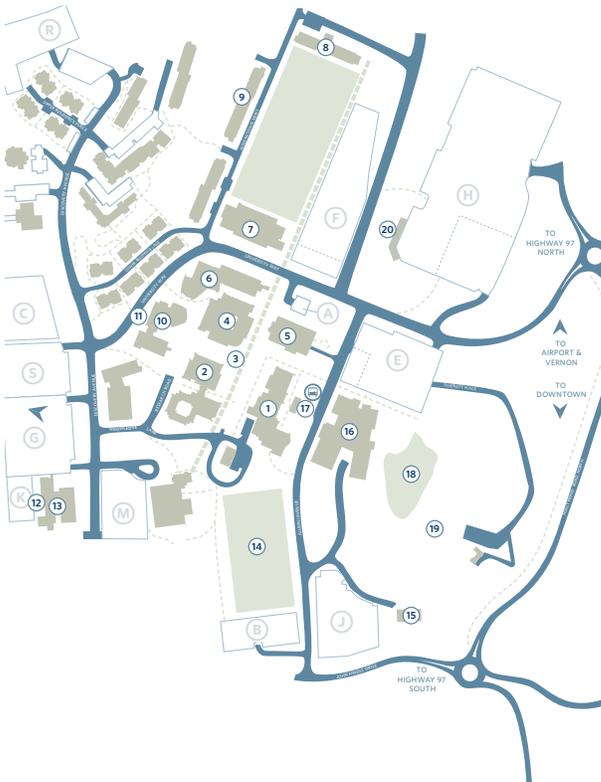
Since 2010, the tours have engaged more than 250 individuals, including staff, faculty and students, 129 local high school students, 20 international students, civic officials and members of the public.

Tours are tailored to community interests and regularly invite the participation of Facilities Management to provide composting and district energy system tours. In response to growing demand, the Office has developed a "self-guided tour" and will continue to provide customized tours in collaboration with interested campus stakeholders and share relevant information for broad dissemination by others.



SUSTAINABILITY WALKING TOUR

UBC's Okanagan campus has been built from the ground up with sustainability in mind. We present the following points of interest as you walk around our beautiful campus. Follow the numbers and read as you go.



1 ADMINISTRATION

This is the administrative hub of the campus. All kitchens including the Sunshine Café participate in the campus' composting program. See back of brochure for more details.



60% of the fruit and 50% of vegetables used in campus kitchens are sourced locally.

2 ARTS

Features an enclosed atrium with banana trees — a popular, peaceful space for study and quiet contemplation.



3 COURTYARD

Located between the Arts building and Science building is a living statue. It's called "Decomposition" and was created by Byron Johnston, associate professor of visual arts. Erected in 2010, this artwork has composting from cafeteria, term papers, lichens, peat moss and more. It also features a telescope.



4 SCIENCE

In the main foyer, you'll find the first prototype of a campus WaterFillz kiosk. These kiosks are now located in all academic buildings on campus, providing filtered water for refilling personal water bottles.



Recycling Station: In 2010, a campus-wide recycling program was implemented which includes paper, plastic, refundables such as pop cans, e-waste, Styrofoam, batteries, lab plastics, glass, and garden waste. Recycling stations are located in each building. Further details on back of brochure.

5 LIBRARY

Remodelled in 2012, the Library building provides a great range of services and spaces that enhance the learning experience on campus. The Sustainability Office, Facilities Management, Postnet, the Bookstore, and the Library are partners in the Rescued Paper Scratch Pad program. Further details on back of brochure.



6 CHARLES E. FIPKE CENTRE FOR INNOVATIVE RESEARCH

Completed in 2008, this 6,923 sq m building was the first in Canada to be awarded five Green Globes — the highest achievement for environmental and energy performance, and equivalent to LEED® Platinum.



Paired with the Arts & Sciences II building, they are the first campus buildings in the world to each receive five Green Globes and also the first paired buildings to attain this distinction.

This is also the first facility on campus to use an open loop geo-exchange groundwater energy system for heating and cooling.

7 UNIVERSITY CENTRE

This 7,408 sq m building was completed in 2009, and is built to LEED® Gold standard.



WaterFillz Kiosk: Each academic building on campus has a WaterFillz kiosk which provides fresh, free, filtered water to students, faculty and staff who fill their own bottles. Each kiosk tracks the number of plastic bottles diverted from the landfill.

Installation of all kiosks was made possible by a partnership between the Sustainability Office, Facilities Management, and UBC Students' Union Okanagan.

8 PURCELL STUDENT RESIDENCE

Occupied in 2011, Purcell has the following sustainable features: a green roof, solar panels for domestic hot water preheat and space-heating demands, in connection with its own closed loop geo-thermal exchange.



9 NICOLA STUDENT RESIDENCE

This is the largest residence on campus at 10,768 sq m. The solar panel on its roof is used for domestic hot water preheat.



10 ARTS & SCIENCES II

This 8,139 sq m building was completed in 2010, receiving the prestigious award of five Green Globes — the highest achievement for environmental and energy performance, and equivalent to LEED® Platinum.



Paired with the Charles E. Fipke Centre for Innovative Research, they are the first campus buildings in the world to each receive five Green Globes and also the first paired buildings to attain this distinction.

11 BIO-SWALE

This is an urban landscape used to convey surface water — enhancing infiltration and reducing surface runoff. Bio-swales are typically moderate gradient devices (approximately one to five in channel slope) and may be covered by grasses, landscape fabric, mulch or other vegetation or leaf filter.



12 HUNTER WIRELESS IRRIGATION SYSTEM

Smart irrigation is utilized across the campus and minimizes unnecessary watering. The Hunter IMMS 2.0 irrigation management monitoring system automatically adjusts or ceases watering times on low temperature (3 degrees Celsius), precipitation (1/8 to 1 inch) or if wind speed is greater than 20 km/hour.



A small computer monitoring control is located in EME and the main weather station is located near RHSC which measures sunlight, rain, and wind speed.

13 REICHWALD HEALTH SCIENCES CENTRE (RHSC)

This is the home of UBC's Southern Medical Program. The 5,104 sq m building was completed in 2012 and is built to LEED® Gold equivalent standards. It has the largest green roof on campus which has integrated indigenous plants and vegetation. A green roof keeps the building cool in the summer and warm in the winter, as well as absorbing rain water and improving air quality.



Water consumption is anticipated to be reduced by nearly 40% compared to a typical building. As a result of its energy efficient design, the RHSC anticipates approximately 285 fewer tonnes of greenhouse gas (CO2e) than a typical building of the same size.

75% of construction waste material was diverted from the landfill.

14 NONIS SPORTS FIELD

This 153-by-75m artificial turf field consists of a permeated plastic carpet with plastic grass blades (no mowing and no watering). The field also features a heat-reflecting surface layer of crumb rubber. It meets international standards for soccer, Canadian football, field hockey, and field lacrosse. It has dramatically extended the playing season for university and community users, replacing a natural grass surface that was closed from the end of October through April.



15 COMPOSTING STATION

Tours must be pre-arranged for this working facility. The Composting Station, which uses two Composting Earth Tubes, diverts over 3,000 lbs of waste from the landfill every month. This system provides highly enriched mulch material for campus ground maintenance.



16 ENGINEERING, MANAGEMENT AND EDUCATION (EME)

Home to four faculties and schools, this is the largest building on campus at 16,769 sq m. Completed in 2012, it has a green roof and is targeted to achieve five out of five points for LEED® Innovation in Design for clear-water utilization, education, green housekeeping, and green power.



Of the 5,415 sq m of non-assignable space, 1,000 sq m is devoted to environmental and social sustainability and 800 sq m is used to house the heat exchange recovery equipment.

The use of low-flow fixtures will provide an anticipated 40% savings over conventional systems.

The energy savings correspond to an anticipated 46% total cost savings at current utility rates.

17 TRANSPORTATION STATION

The Universal Bus Pass (U-Pass) Program — a partnership between UBC's Okanagan campus, BC Transit, City of Kelowna and the Regional District of Central Okanagan — provides students with a low-cost, sustainable transportation option. Other important features and transportation initiatives include:



- Bus shelters have low-energy solar-powered lighting.
- Sheltered bike racks and end-of-trip facilities for cyclists.
- Preferred parking for carpools.
- Parking stalls for electric cars, charging stations (6).

18 RETENTION POND

The man-made pond acts as a filtration system for storm water, preventing harmful materials from entering Okanagan Lake.



19 LEARNING GARDEN

A model campus garden dedicated to promoting the principles of sustainable environmental practice, responsible stewardship of nature, interdisciplinary learning and knowledge.



20 GEO-THERMAL EXCHANGE

The geo-thermal district energy system (DECS) is used to heat and cool campus buildings. This closed-loop system will reduce natural gas consumption and the campus' carbon footprint.



ACTIONS TOWARDS CARBON NEUTRALITY

The actions listed below contribute to a reduction in greenhouse gas emissions from sources for which public sector organizations are responsible under the carbon neutral government regulation of the Greenhouse Gas Reduction Targets Act.

ACTION	STATUS	STEPS TAKEN
Mobile Fuel Combustion (Fleet and other)		
Behaviour change program		
Provide fleet driver training to reduce fuel use	Ongoing/In Progress	100% of all new driving employees are trained.
Introduce anti-idling policy and/or raise anti-idling awareness for fleet drivers (e.g., signs, stickers, messages)	Ongoing/In Progress	Ongoing communication to support anti-idling practice. Signage in place.
Encourage carpooling in fleet vehicles	Ongoing/In Progress	Continued promotion and encouragement to minimize the number of trips into town for purchase or send one person to get all items.
Promote alternatives to fleet vehicle travel where possible (e.g., bicycles, public transit, walking)	Ongoing/In Progress	Included in anti-idling practice. Continue promoting no use of golf carts in the courtyard between 8 a.m. – 4 p.m..
Other Mobile Fuel Combustion Actions		
Provide electric charging stations for commuters	Ongoing/In Progress	6 stations available on campus
Vehicle fuel efficiency		
Replace vehicles with more fuel-efficient models	Ongoing/In Progress	1 gas golf cart replaced with electric. 4 remaining gas golf carts of a fleet of 17.
Replace larger vehicles with smaller models according to fleet “right- sizing” principles	Ongoing/In Progress	As existing vehicles are retired they will be replaced with high efficient and/or hybrid vehicles.
Perform regular fleet maintenance to improve fuel-efficiency	Ongoing/In Progress	All vehicles are regularly maintained.

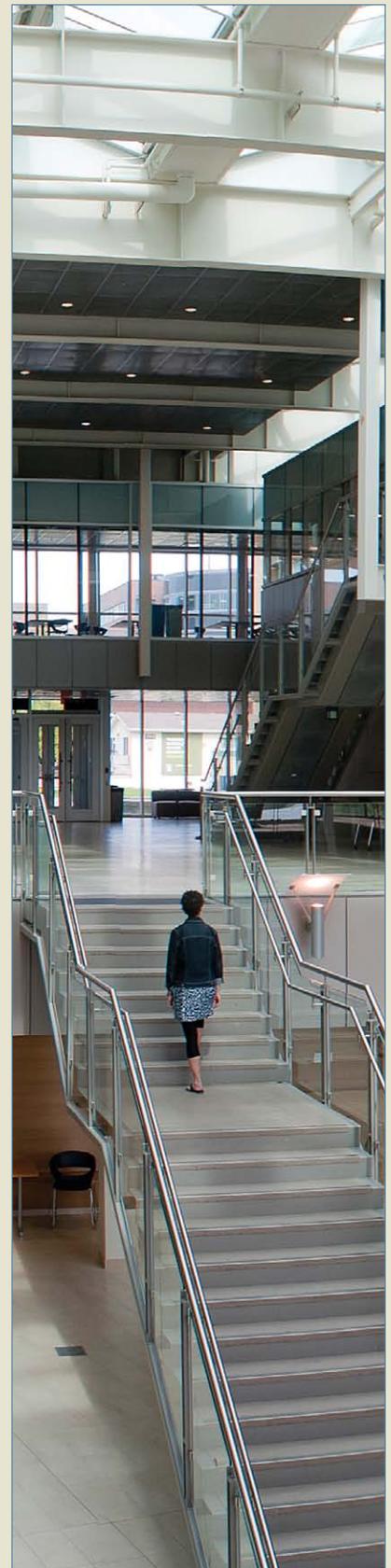
STEPS PLANNED	START YEAR	END YEAR
Continue driver training for new employees. Continuation of mandated pre-trip inspections for fleet vehicles (internal Facilities practice).	2010	No End Date (Continuous)
Continue discussions regarding anti-idling with Post Secondary Transit Committee to support anti-idling practice.	2009	No End Date (Continuous)
Considering measures to eliminate need for fleet vehicles to collect items. Looking at strategies to reduce on/off campus travel. i.e. Purchase through Central Stores. Continue to promote under anti-idling practice.	2009	No End Date (Continuous)
Continue to promote walking where possible.	2009	No End Date (Continuous)
Promote and educate community on availability of electric vehicle (EV) stations.	2011	No End Date (Continuous)
As existing vehicles are retired they will be replaced with electric or fuel efficient vehicles as appropriate. Plan to replace 2 more gas golf carts with electric in 2013.	2008	No End Date (Continuous)
As existing vehicles are retired they will be replaced with high efficient and/or hybrid vehicles. Size will be considered and a purchasing factor balanced according to vehicles use.	2008	No End Date (Continuous)
Continue regular maintenance of all fleet vehicles.	2008	No End Date (Continuous)



ACTIONS TOWARDS CARBON NEUTRALITY

ACTION	STATUS	STEPS TAKEN
Stationary Fuel Combustion, Electricity		
Behaviour change program		
Help staff reduce personal energy use through “workstation tune-ups”	Ongoing/In Progress	Updates to website to build awareness of energy saving behaviours. Communication through Shift publication. Continuation of IT Services Evergreen Program for computer and laptop replacement.
Ask staff to unplug electrical equipment or switch off power bars when not in use	Ongoing/In Progress	Updates to website to build awareness of energy saving behaviours. Communication through Shift publication.
Ask staff to close blinds at end of work day to reduce heating/cooling demands	Ongoing/In Progress	As above.
Encourage staff to use air dry setting on dishwashers	Ongoing/In Progress	As above.
Provide tips to staff on saving energy in the office while working outside of regular business hours	Ongoing/In Progress	As above.
Encourage use of stairs instead of elevators	Ongoing/In Progress	As above.
Provide reminders for turning off lights (e.g., signs, stickers, messages)	Ongoing/In Progress	As above.
Promote hot water conservation	Ongoing/In Progress	As above.
IT power management		
Install power management software which shuts down computers outside of regular business hours	Ongoing/In Progress	98% of faculty have laptops and lab research desktop computer numbers continue to increase. All computer labs’ computers are set to automatically shut-off between 12 a.m. and 7 a.m. (Mac computers are set to sleep).
Implement server virtualization	Ongoing/In Progress	95% of servers have been virtualized since start year indicated. Have reduced servers to 4 from 6. The virtual desktop program is on hold.

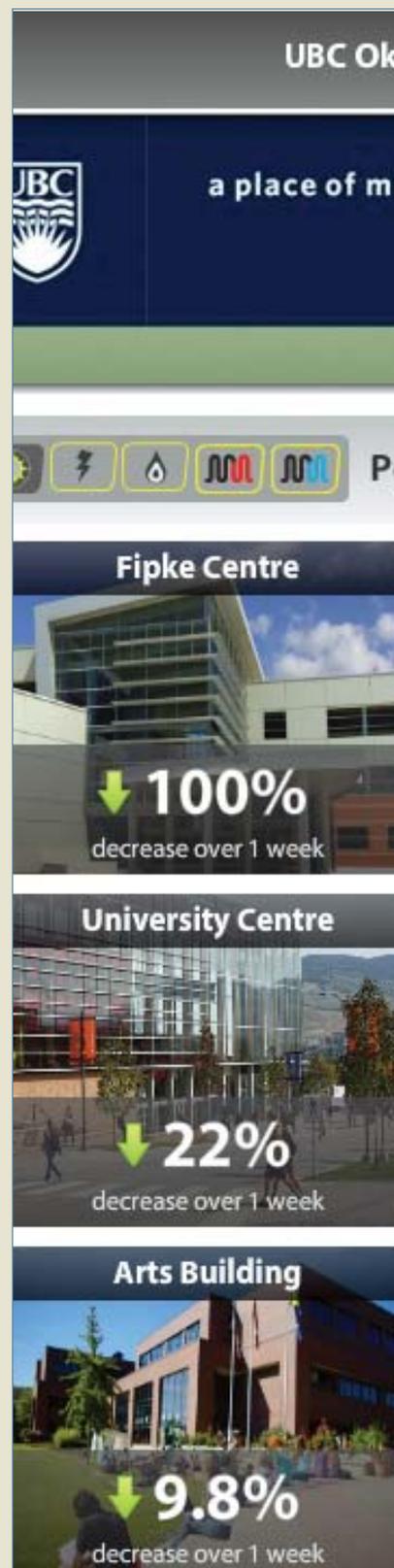
STEPS PLANNED	START YEAR	END YEAR
Continue education, promotion, and encouragement of sustainable behaviours and practices. Focused behaviour change strategy for active energy reduction amongst staff and faculty planned for 2013- 2015 (The Power of You). Pulse Energy Dashboard available publicly for building occupants to monitor consumption and engage in behaviour change. FortisBC active partner.	2009	No End Date (Continuous)
Measure phantom load and begin communication efforts to reduce it. Determine barriers to behaviour change through surveys within energy engagement strategy (Power of You). Provide support to reduce barriers. E.g. accessible power bars for ease of shutdown overnight.	2009	No End Date (Continuous)
Focused program of behaviour based change toward energy reduction targets 2013-2015 (Power of You). Support Green Teams to provide outreach to building occupants.	2009	No End Date (Continuous)
As above.	2009	No End Date (Continuous)
As above.	2009	No End Date (Continuous)
As above.	2009	No End Date (Continuous)
As above.	2009	No End Date (Continuous)
As above.	2009	No End Date (Continuous)
Regular replacement program 3 years for laptops and 4 years for desktops. Up to 2/3 reduction in power consumption for replacement units. IT is actively measuring power consumption of various workstations to continue optimizing.	2005	No End Date (Continuous)
Completing additional 25% virtualization of the phone system; all phone servers that can be virtualized will be converted within the next year. Over the next 3 years, there will be a reduction of the number of physical servers by providing low to no cost virtual server options to researchers. Pilot projects include a virtual desktop for use in labs.	2007	No End Date (Continuous)



ACTIONS TOWARDS CARBON NEUTRALITY

ACTION	STATUS	STEPS TAKEN
Apply auto-sleep settings on computer monitors and CPUs	Ongoing/In Progress	100% of computers have auto-sleep settings applied.
Remove stand-alone printers, copiers, and/or fax machines and install multi-function devices as part of a print management strategy	Ongoing/In Progress	Continuous reassessment within space planning function.
Apply auto-sleep settings on printers, fax machines, and/or multi- function devices	Ongoing/In Progress	100% of devices auto-sleep settings applied
Replace computers with ENERGY STAR models during regular computer upgrades	Ongoing/In Progress	Complete
Other Stationary Fuel Combustion		
Recover waste heat from data centres	Ongoing/In Progress	Administration Building data centre tied to Geo-X District Energy Loop (DES). Library data centre tie-in has been estimated at \$100,000. EME data centre was tied-in during build out and is working.
Changing switches in 40 communication rooms	Ongoing/In Progress	120 V switches replaced with 240 V switches, 14% power consumption reduction per switch and reduced heat generation.
Building Optimization Plan	Ongoing/In Progress	Development of agreement with FortisBC for Building Optimization Plan. Consulting firm retained.
Owned buildings		
Establish energy performance baseline for owned buildings	Ongoing/In Progress	Baseline is adaptive as improvements are undertaken and as Geo-X District Energy Loop (DES) is optimized. 2012 was the first full year of operation with a closed DES.
Register for performance labelling/certification for operations and maintenance of owned buildings (e.g., LEED EB:O&M)	Ongoing/In Progress	Buildings were completed and occupied and final commissioning is underway for EME. Started LEED certification process for RHCS and EME.
Achieve LEED NC Gold certification at a minimum for new construction or major renovations	Ongoing/In Progress	All new academic buildings are built to LEED Gold standard or equivalent. All new residential buildings are built to UBC REAP Building standards.

STEPS PLANNED	START YEAR	END YEAR
Continue to educate users to leave sleep setting on through implementation of campus wide behaviour change energy engagement strategy (Power of You).	2005	No End Date (Continuous)
Continuous reassessment within space planning function.	2008	No End Date (Continuous)
Continue to ensure devices are set to auto-sleep.	2005	No End Date (Continuous)
Continue to ensure all computers are ENERGY STAR rated.	2005	No End Date (Continuous)
Look for further opportunities to tie data centres to DES.	2011	No End Date (Continuous)
Continue to upgrade switches.	2012	2014
In partnership with FortisBC UBC Okanagan is implementing a program to monitor energy consumption and implement physical retrofits to reduce consumption. Building occupants will be encouraged to reduce energy consumption through a focused behaviour change program (Power of You).	2012	No End Date (Continuous)
Continuation of campus-wide energy monitoring through SMARTTool reporting. Energy Monitoring in real time through the Pulse Energy Dashboard in nine academic buildings.	2010	No End Date (Continuous)
All residences built to REAP Gold standard. All new academic buildings are built to LEED Gold standard. In process to achieve LEED Gold certification for Engineering/Management/Education Building and Reichwald Health Sciences Centre.	2008	No End Date (Continuous)
As mandated, all new academic buildings are built to LEED Gold standard or equivalent and all new residential buildings are built to UBC REAP Building standards. In process to achieve LEED Gold certification for Engineering/Management/Education Building and Health Sciences Centre.	2008	No End Date (Continuous)



ACTIONS TOWARDS CARBON NEUTRALITY

ACTION	STATUS	STEPS TAKEN
Perform energy retrofits on existing, owned buildings	Ongoing/In Progress	Completed a feasibility study to identify Carbon Reduction Measures and paybacks. With FortisBC, set up agreement for a Building Optimization Plan to monitor baseline consumption and identify energy savings projects.
Incorporate a refrigerant management strategy into regular building management/maintenance to reduce fugitive emissions	Ongoing/In Progress	Continuation of reported refrigerant top-ups by service provider. UBC monitors service tags and maintains service records of equipment and reports in-scope emissions. Usage has increased and now exceeds the reporting threshold.
Planning/management		
Reduce office space (square meters) per employee	Ongoing/In Progress	
Install a real time metering system (e.g. Pulse, Reliable Controls, Houle Controls)	Ongoing/In Progress	Pulse Energy Dashboard real time metering installed for nine academic buildings. Measures and publicly displays energy consumption volume and type (electricity, natural gas, hot water, and DES).
Retrofit details for owned buildings		
Upgrade mechanical systems (heating, cooling, ventilation) during retrofits	Ongoing/In Progress	Ongoing retrofits for HVAC and occupancy sensor controls completed on all laboratories and theatres in all existing buildings.
Upgrade lighting systems during retrofits	Ongoing/In Progress	Completed retrofit conversion from T-12 to T-8 campus wide. Additional 3,600 T-12 ballasts changed to T-8 on campus in 2012; direct rebate applied to purchase cost. Retrofit saves campus 196,000 kWh/yr.
Upgrade/adjust control systems during retrofits	Ongoing/In Progress	Installed solar powered signage lighting on all academic buildings.
Improve building insulation (including windows) during retrofits	Ongoing/In Progress	Replaced blinds in Arts building on second floor, blocking UV light and insulating rooms.
Supplies (Paper)		
Behaviour change program		
Train staff to use collaborative software for electronic editing (e.g. SharePoint, Groove, etc.)	Ongoing/In Progress	A campus wide shared drive is available for access by all departments.
Encourage staff to hold paperless meetings or presentations (i.e., no handouts)	Ongoing/In Progress	The addition of Smart boards and increased use of laptops are reducing paper consumption.

STEPS PLANNED	START YEAR	END YEAR
Work towards optimization of the geothermal system and energy reduction strategies in all existing owned buildings. Implement Building Optimization Program and associated retrofits.	2008	No End Date (Continuous)
Increase maintenance and plan a design review. Plans are underway to determine root cause and address maintenance issues/upgrades as budget allows. Continue to monitor and report emissions.	2008	No End Date (Continuous)
Moving towards reconfiguring and reducing space to align with space standards. Space intensification to begin in 2013. Infrastructure Development – Facilities Planning report available online: http://provost.ok.ubc.ca/__shared/assets/facstudy32094.pdf .	2008	No End Date (Continuous)
Developing baseline energy consumption. Working with a consulting firm to identify and prioritize energy reduction projects, implementing physical retrofits and establishing a two year behaviour based change strategy (Power of You).	2012	No End Date (Continuous)
The Building Optimization Program in partnership with FortisBC, will identify further cost recovery retrofits for consideration.	2009	No End Date (Continuous)
The Building Optimization Program will identify further cost recovery retrofits for consideration.	2009	No End Date (Continuous)
The Building Optimization Program will identify further cost recovery retrofits for consideration.	2008	No End Date (Continuous)
Plans are in place to replace blinds in Science building in 2013.	2009	No End Date (Continuous)
Increase awareness through education to promote use of shared drives.	2010	No End Date (Continuous)
Continue to promote paperless offices through behaviour change program.	2008	No End Date (Continuous)



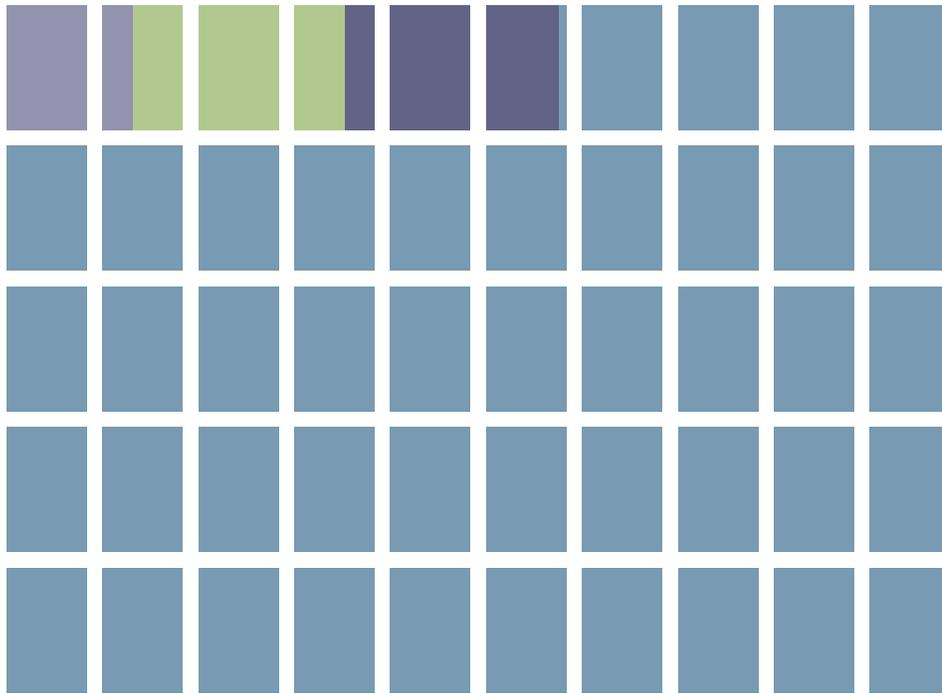
ACTIONS TOWARDS CARBON NEUTRALITY

ACTION	STATUS	STEPS TAKEN
Electronic media in place of paper		
Install collaborative software for electronic editing (e.g. SharePoint, Groove, etc.)	Ongoing/In Progress	100 % complete.
Use electronic document library for filing common documents	Ongoing/In Progress	Complete. A campus wide shared drive is available for access by all departments.
Switch to an electronic payroll notification system in place of paper pay stubs	Completed (in Previous Year)	
Other Paper Supplies Actions		
Look at new opportunities to pool inventory sharing i.e. paper and general office supplies	In Development	In development
Paperless Office	Ongoing/In Progress	Several offices are striving to develop paperless office practices and strategies.
Give access to view printing numbers.	In Development	In development
Paper Type		
Purchase 30% post-consumer recycled paper	Ongoing/In Progress	<p>In 2012, 97% of purchases through official supplier Unisource contained 30% post-consumer recycled content or better. When direct purchases through Grand & Toy, Staples, and XGS are included, 82% of total university paper purchases contain 30% post-consumer recycled content or better.</p> <p>Selected new official paper supplier (Grand & Toy) and negotiated better pricing for 50% PCR paper (to be cheaper than previously offered 30% PCR paper with previous supplier). UBC's Okanagan campus developed a custom UBC site for ordering that highlights 30%, 50% & 100% PCR paper options. Virgin paper eliminated as an option on the custom site and is priced more expensive than 30- 100% PCR paper.</p>
Printer/document settings		
Switch networked printers and photocopiers to automatic double-sided	Ongoing/In Progress	10% of network printers or photocopiers are set to automatic double-sided. Automatic double-sided printing option pre-set on lab printers. 10% of UBC Okanagan fleet are located in laboratories.

STEPS PLANNED	START YEAR	END YEAR
Increase awareness through education to promote use of shared drives.	2008	No End Date (Continuous)
Increase awareness through education to promote use of shared drives.	2008	No End Date (Continuous)
		No End Date (Continuous)
Continue	2012	No End Date (Continuous)
Continue to promote paperless offices through behaviour change program.	2010	No End Date (Continuous)
Continue to develop	2011	No End Date (Continuous)
Grand & Toy will also be adding the option of wheat paper to our custom list as a tree free paper alternative. Continue to promote 50% post-consumer recycled content paper.	2008	No End Date (Continuous)
Track duplex printing usage and increase awareness through behaviour change and user education programs to promote use of double sided printing on all faculty and staff computers.	2009	No End Date (Continuous)



GREENHOUSE GAS EMISSIONS BY SOURCE FOR THE 2012 CALENDAR YEAR (tCO₂e*)



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

- 1.4%
45.4
Mobile (fleet and other mobile equipment)
- 2.2%
72.6
Fugitive (Refrigerants)
- 2.3%
75.5
Supplies (Paper)
- 94.2%
3,123.5
Stationary (Building Heating and Generators) and Electricity

TOTAL EMISSIONS: 3,317

OFFSETS APPLIED TO BECOME CARBON NEUTRAL IN 2012

Total offsets required: 3,316. 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.

electric



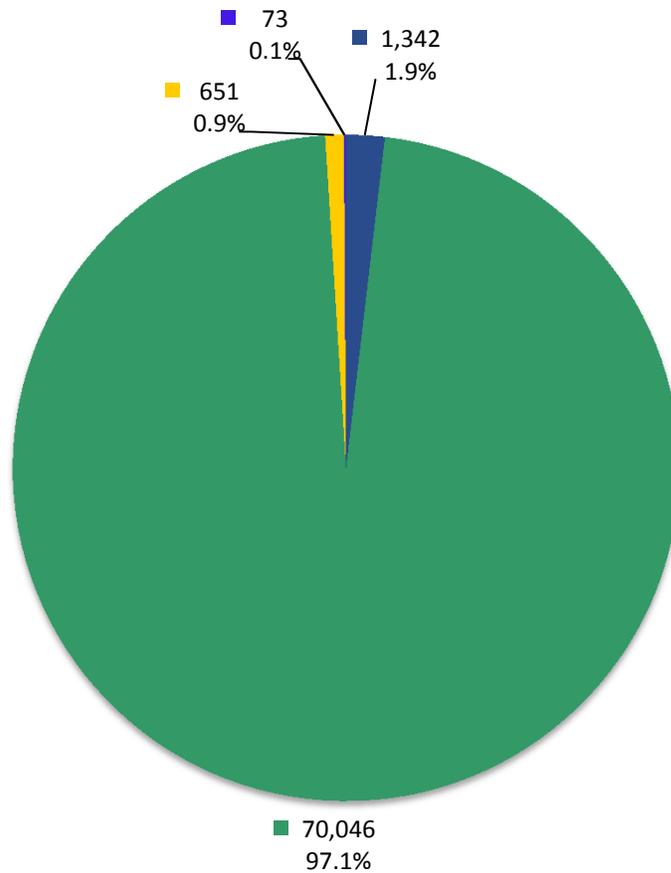


2012 CARBON NEUTRAL ACTION OVERVIEW REPORT
FOR UBC'S OKANAGAN CAMPUS



a place of mind
THE UNIVERSITY OF BRITISH COLUMBIA

University of British Columbia Greenhouse Gas Emissions by Source for the 2012 Calendar Year (tCO₂e*)



Total Emissions: 72,112

- 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 2012 (Generated May 13, 2013 2:54 PM)

Total offsets required: **68,115**. Total offset investment: **\$1,702,875**. Emissions which do not require offsets: **3,996** **

*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.