



2013

carbon neutral action report

SIMON FRASER UNIVERSITY



ACKNOWLEDGEMENTS

This report was produced by Simon Fraser University. It provides a high-level overview of the actions taken by the SFU campuses to reduce greenhouse gas emissions and promote a culture of sustainability.

For more information about sustainability at SFU, please visit our website:

www.sfu.ca/sustainability

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2013

CARBON NEUTRAL ACTION REPORT



SUBMITTED BY:

KC Bell
Director, SFU Sustainability Office

EXECUTIVE SUMMARY

In 2013, SFU continued to broaden its institutional understanding, as well as its activities in support of sustainability; extended its years-long commitment to conserving energy and reducing its GHG emissions; and, acting on the momentum created by the approval of its first Sustainability Strategic Plan in June 2013, improved energy efficiency through community engagement programs directed at culture and behaviour change. The creation, launch and expansion of several multi-department initiatives will contribute to the ongoing reduction of Scope 1, 2 and 3 emissions.

SFU reduced greenhouse gas emissions in 2013 by 5% from 2012 and has now achieved a 12% reduction in emissions since the baseline year of 2007, despite the growth in building footprint of approximately 11% in the same period.

Facilities Services continued to improve campus energy performance through projects that optimize building operations. These projects were identified through BC Hydro's Continuous Optimization Program and

implemented as part of Facilities Services' Energy Management Program. In 2013, these focused on three core academic buildings (Education, RC Brown and Strand Hall) on SFU's Burnaby campus. Facilities Services also secured a commitment from the University of \$1M to create a Sustainable Utilities Revolving Fund (SURF) for energy and water efficiency projects over the next four years.

Building on a strong history of engagement for energy conservation, the SFU Sustainability Office and Facilities Services expanded the Green Office and Green Lab Certification programs to all three SFU campuses.

The year 2013 also marked efforts to develop key performance indicators on GHG emissions outside of mandatory scope for the Carbon Neutral Action Report. Efforts are underway to develop methods to measure organizational Scope 3 emissions such as business travel, commuting and waste.



SFU's comprehensive Zero Waste program was launched in 2013. The Sustainability Office and Facilities Services executed an extensive communication campaign to prepare for the January 2014 rollout of four-stream waste management systems on all three of SFU's campuses.

Finally, the SFU Sustainability Office supported energy savings through multi-audience engagement programs. Sustainability Ambassadors presented "Sustainability 101" workshops to their departments through the staff Ambassador Program. The Office launched its "Talking Sustainability" blog, which has a diverse and growing readership. The Sustainability Office, in partnership with the student-run Sustainable SFU, also launched the first sustainability-focused student Peer Education program, with a total of 16 peers between the two organizations.

OVERVIEW

This is the Carbon Neutral Action Report for Simon Fraser University. This report contains our 2013 emissions profile, offsets purchased, the actions we have taken in 2013 to reduce our GHG emissions, and our plans to continue reducing emissions in 2014 and beyond.

By June 30, 2014, Simon Fraser University's final CNAR will be posted to our website: <http://www.sfu.ca/sustainability/publications/cnar.html>

KC Bell
Director, SFU Sustainability Office

May 30, 2014

1.0 GREENHOUSE GAS EMISSIONS & OFFSETS

1.1 GREENHOUSE GAS EMISSIONS IN 2013

Total (absolute) GHG emissions for Simon Fraser University's operations in 2013 were 17,001 tonnes CO₂e*. Emissions decreased by approximately 5% compared to 2012 levels, due at least partly to a warmer weather year, and to a reduction in electricity emissions factors. Between 2012 and 2013, university physical space decreased slightly, by 0.4%** . Emissions for 2013 are approximately 12% lower than the 2007 baseline (see Table 1). Overall, the university's physical space has increased about 11% since 2007.

1.2 OFFSETS APPLIED TO BECOME CARBON NEUTRAL IN 2013

In 2013, as reported in the BC Provincial Government's SMARTTool, SFU purchased 16,919 tonnes of carbon offsets from Pacific Carbon Trust. At the price of \$25 per tonne, this amounted to \$444,123.75 of offsets after GST. An overpayment for 72 tonnes of carbon offsets (\$1890 in offsets, after GST) in 2012 was reconciled in the 2013 repayment (the payment for 2013 being for 72 tonnes less than the 2013 emissions).

Ten tonnes of CO₂ equivalent emissions from the combustion of biomass fuels were reported as part of our total greenhouse gas emissions profile in 2013. As stated in the 2013 BC Best Practices Methodology for Quantifying Greenhouse Gas Emissions, the carbon dioxide emissions resulting from the combustion of biogenic fuel sources must be reported but do not require offsets.

* 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

** From SFU's Annual Space Reports: http://www.sfu.ca/fs/Campus-Facility-Profiles/Campus-Space-Inventory_Chronology.html



SOURCE*	2007 (tCO ₂ e) BASELINE YEAR**	2011 (tCO ₂ e)	2012 (tCO ₂ e)	2013 (tCO ₂ e) CURRENT YEAR
Buildings – Stationary Fuel Combustion and Purchased Energy	17,995	18,133	17,400	16,453
Fleet – Mobile Fuel Combustion	940	283	245	298
Paper – Office Supplies	357	334	270	250
Carbon Neutral or Offset Exempt	N/A	-9	-8	-10
Total Emissions Calendar Year	19,292	18,751	17,915	17,001
Total Emissions Requiring Offset Payments	N/A	18,742	17,907	16,991
Offset carry-over from Previous Year	N/A	221	298	72
Total Emissions Offsets Purchased	N/A	18,660	17,520	16,919

FIGURE 1

Simon Fraser University Greenhouse Gas Emissions by Source per Year

1.3 CHANGES TO GREENHOUSE GAS EMISSIONS & OFFSETS REPORTING FROM PREVIOUS YEARS

Following the public release of Simon Fraser University's 2012 Carbon Neutral Action report it was determined that the total emissions for the 2012 calendar year were over-reported by 72 tonnes CO₂e, with a consequent over-purchase of offsets required to become carbon neutral in 2012 of \$1,890. This surplus of offsets purchased has been applied against our 2013 emissions.

* Emissions data (2011, 2012, 2013) are values are exported from May 15, 2014 SMARTTool.

For simplicity, values with decimals have been rounded off.

** 2007 baseline set from Willis Energy: SFU GHG Inventory Report

2.0 ACTIONS TAKEN TO REDUCE GREENHOUSE GAS EMISSIONS IN 2013

In 2013, as in previous years, building space was the most significant source of emissions in SFU's footprint. As a growing university, with an increase in full-time equivalent student population of 24% since 2007, as well as growth in staff and faculty numbers, it is of paramount importance to absorb new energy demands linked to the growth in space and numbers with as little emission and energy use impact as possible. Growth in research activity and the ongoing meteoric demands for energy to support Information Technology make reducing energy consumption a major challenge.



Since 2007, SFU's building footprint grew by approximately 11%. Maintaining efficient buildings is key to managing the University's GHG emissions. SFU manages demand through the systematic "tuning-up" of buildings and by implementing retrofits to older building systems (e.g., HVAC, lighting). Retrofitting is done in conjunction with expanding and improving behaviour change programs designed to make students, faculty and staff better 'energy tenants' in campus buildings. The majority of emissions reductions in the 2013 calendar year were reductions in emissions from buildings. In 2013, projects identified through the C-Op Program were implemented in three buildings (Education, Strand Hall and Robert C. Brown Hall).

As part of the C-Op program, a total of 19 buildings on the Burnaby campus are now connected to energy dashboard displays. These displays provide live data on energy performance, and increase the ability of the Energy Management Office and operational staff to review energy performance of all the buildings in close to real-time. Performance by the remaining SFU buildings continues to be monitored for future energy project opportunities.

In 2013, SFU's Senior Administration also created a \$1M Sustainable Utilities Revolving Fund (SURF) for energy and water efficiency projects over the next 4 years. Cost savings return to SURF to support future rounds of investments. The first SURF-funded project was the replacement of older lighting with LEDs in the Academic Quadrangle concourse; this project is expected to have a 3.4-year payback period.

In addition to building retrofits, in 2013 SFU:

- Reduced emissions related to paper by 7% since 2012, and by 30% from 2007.
- Committed in the Sustainability Strategic Plan to continue work to achieve GHG emission reductions congruent with the BC Government's GHG emission reduction targets (i.e., 18% by 2016).
- Expanded the Green Office Certification and the Green Labs Programs from pilot projects to be available to all University departments and laboratories. SFU's Green Labs Program, a partnership between the Sustainability Office, Facilities Services, Environmental Health and Safety, and dedicated building occupants, provides engagement and education materials and opportunities, as well as on-site physical adjustments to optimize energy use in laboratories.

During the pilot of this project (August 2011 to March 2013) the electricity avoidance amounted to about 246,000 kWh, equivalent to the annual electricity consumption of 22 households and \$13,000. The natural gas avoidance was about 1,400 GJ, equivalent to the annual gas consumption of 15 households and \$7,000.

- Continued the development of the campus Zero-Waste Initiative and prepared for the implementation of the campus Zero-Waste Plan.



- Renovated three videoconferencing rooms and built multiple mobile carts to enable conferencing in order to reduce Scope 3 travel emissions. SFU remains the top Blue Jeans (cloud video conferencing) user in the BCNET consortium. In 2013, SFU had over 59,000 participant minutes logged.
- Installed two lecture recording theaters, allowing professors to stream lectures live. These theatres are being piloted in 2014.

3.0 PLANS TO CONTINUE REDUCING GREENHOUSE GAS EMISSIONS: 2013 - 2015

SFU has several short- and long-term plans to continue reducing its greenhouse gas emissions:

- Continue to implement projects identified through the BC Hydro Continuous Optimization Program (C-Op).
- Extend C-Op program to another 3 buildings: Blusson Hall, Saywell Hall, and Discovery 1.
- Continue to implement lighting and building retrofits, particularly through the SURF fund and Carbon Neutral Capital Program (CNCP).
- Continue to support the certification of laboratories and departments through the Green Labs and Green Office Certification Programs.
- Rollout the Zero Waste Initiative, replacing all waste bins in public spaces with four-stream Zero Waste Stations in order to move towards SFU's goal of 70% waste diversion by 2015.
- Prepare detailed action plans for the SFU Sustainability Strategic Plan.
- Expand the Sustainability Peer Program through on-campus partnerships.
- Establish campaigns to increase sustainable procurement for office supplies.
- Pilot four video-conferencing courses in the two new lecture recording theatres during the 2014 Spring semester.
- Expand community outreach efforts through social media to encourage everyday behaviours that can help to reduce energy waste.
- In the long term, continue building a comprehensive calculation of the carbon footprint of the university to include Scope 3 emissions in key areas of organizational impact such as commuter travel and waste.
- Expand on the Energy System Engineering Program in a new building at the Surrey Campus.



4.0 ACTIONS TAKEN TO ADVANCE SUSTAINABILITY & CARBON NEUTRALITY

In April 2013, SFU's Vice Presidents approved the first University-wide Sustainability Strategic Plan. Building on the commitment made in SFU's Sustainability Policy GP 38, and the identification of sustainability as one of the University's six guiding principles, the Plan articulates SFU's strategic direction through goals, outcomes and strategies to be pursued across all Vice Presidential portfolios. Reinforcing the pillars of SFU's Strategic Vision, the four overarching goals of the plan are:

Goal 1 | Engaging Students

To provide a supportive learning environment and diverse learning opportunities that enable all students to gain the knowledge, critical capacities, research skills and civic understanding required to become engaged global citizens and leaders in the transition to sustainable communities worldwide.

Goal 2 | Engaging Research

SFU will promote the development of research initiatives at SFU that strengthen our understanding of the complexities of, and interconnections among, ecological, economic and social sustainability and developing and applying ecologically responsible research practices.

Goal 3 | Engaging Communities

To develop partnerships and maximize the capacities of SFU's three campuses in ways that enhance the ecological, social and economic well-being of communities locally and globally. In this regard, SFU will demonstrate its leadership and commitment of the underlying principles of human rights and sustainable development.

Goal 4 | Leveraging Institutional Strength: Operational Leadership

SFU will enhance understanding of sustainability among the SFU community in order to integrate sustainability into SFU's administrative and operational planning systems, policies, processes and activities.

Greenhouse gas reduction and energy efficiency are integrated directly within Goal 4, Strategy 5 of the Plan, which articulates SFU's commitment to improving its environmental footprint, addressing energy use, GHG emissions, toxic inputs and waste. Achieving reductions to its environmental footprint demonstrates a tangible commitment to sustainability, reduces operating costs, and spurs more members of the SFU community to begin to view the world and their work through a "sustainability lens."

In addition to high-level sustainability planning, SFU advanced sustainability (environmental, social, and economic) and carbon neutrality on each of SFU's campuses. Some of these actions are listed below:



- On June 9, 2013, Facilities Services and the Sustainability Office received the 2013 City of Burnaby Environmental Star Award. Simon Fraser University's Green Labs Program was recognized for its contributions to environmental sustainability and reducing the energy footprint of campus science buildings.
- The President's Office launched the President's Awards for Leadership in Sustainability, celebrating faculty, staff, and students who demonstrate outstanding leadership in advancing sustainability within or beyond the university.
- On February 7, 2013, in support of the WWF's National Sweater Day, Facilities Services turned down the temperature in campus buildings to conserve energy and organized the communications sent to the campus community to encourage them to wear a sweater that day. Simon Fraser University won BOMA's inaugural Sweater Day Challenge for this event.
- The Sustainability Office in partnership with Sustainable SFU (student-led not-for-profit), Career Services, Faculty of Environment and SFU Pacific Institute for Climate Solutions hosted Sustainability Opportunities Week, providing students with opportunities to explore how sustainability could be integrated into all types of career paths, volunteer work, or educational pursuits.
- The Sustainability Office launched its "Talking Sustainability" blog, which has a diverse and growing readership. The purpose of the blog is to broaden the discussion of sustainability beyond the now-conventional conversations concerning energy management and other typical "environmental" topics. By doing so, it is intended to enrich public understanding of the profound relationships among the social, cultural, economic and environmental aspects of sustainability.
- Faculties continued to expand SFU's offering of sustainability-focused and sustainability-related courses, with over 100 courses focused on sustainability, and over 250 courses that include sustainability.
- At the Vancouver Campus alone, SFU hosted over 180 sustainability-related events.
- SFU maintained Fair Trade Campus status, meeting Fairtrade Canada's standards in availability of Fair Trade products, visibility on the concept of Fair Trade and the establishment of a campus Fair Trade Committee. SFU also served as a leader and advocate for fair trade in Canada's post-secondary food services world, insisting that Starbucks offer Fair Trade certified coffee options at all times as a condition of opening its location on the SFU Burnaby Campus.
- Ancillary Services formed the Sustainable Mobility Advisory Committee, which convenes representatives from multiple departments and organizations on campus to address mobility issues.

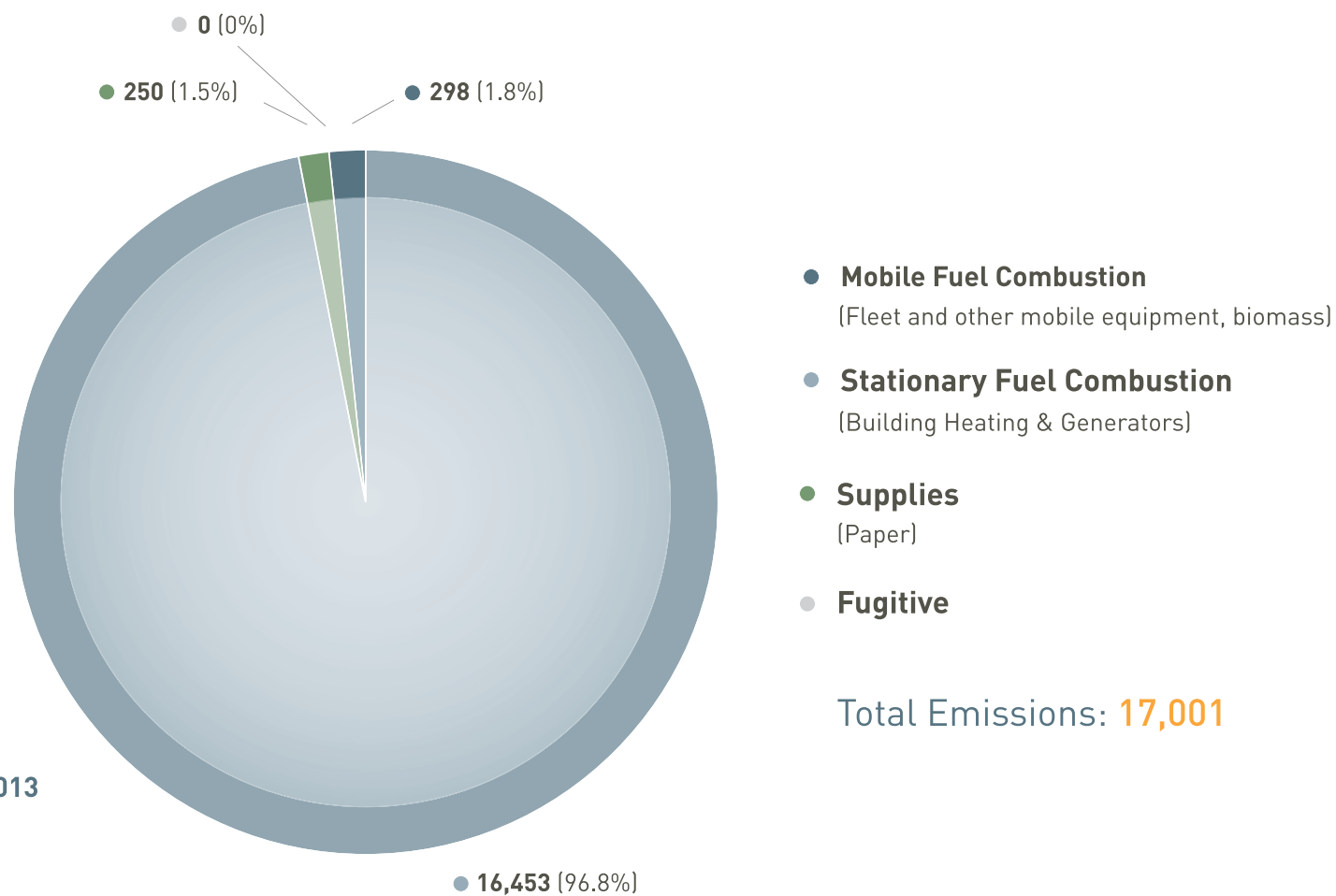


- Began offering an 80% tree-free (wheat-based) office paper as an alternative to recycled content paper through its internal supplier, Document Solutions.
- Ten electric charging stations were installed on Burnaby Mountain through SFU-BC Government and SFU Community Trust-BC Government funding partnerships and grants.
- Aerators were installed on sink faucets in the washrooms in Strand Hall, Discovery 2 and West Mall.

SFU will continue to pursue initiatives to improve the sustainability of the institution as a whole, guided by the SFU Sustainability Strategic Plan.

5.0 APPENDIX

Greenhouse Gas Emissions by Source for the 2013 Calendar Year (tCO₂e)



Offsets applied to Become Carbon Neutral in 2013

Total offsets required: **16,919**

Total offset investment: **\$444,124**

Emissions which do not require offsets: **10***

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

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

Created Tuesday, February 04, 2014

Updated Friday, May 30, 2014

<https://fluidsurveys.com/surveys/cas-z/2013-cnar-form-bps-actions/5542f4301fb2999c2e9e73c902c99b98/>

Page 1

Please complete the following sections of the 2013 Carbon Neutral Action Report form. Save your work frequently to prevent it from being lost. You can also save a copy for your own use as either a WORD or PDF file using the buttons at the bottom of each page.

This is Part 2 of the Carbon Neutral Action Report form. This section reports on actions taken to reduce emissions during the 2013 calendar year. This information will be included in your final Carbon Neutral Action Report posted on the Ministry of Environment website.

When the form is complete press the submit button on the last page to automatically submit the information to the Climate Action Secretariat (CAS). Do not press submit before you are ready – this may result in a loss of work.

In addition to completing this survey (Part 1 2), you are required to submit your completed Overview (Executive Summary) and Self-Certification Checklist. The 2013 Overview template was included in the email sent and can also be found on the LiveSmart leaders Community.

Please ensure you meet the following reporting deadlines:

A DRAFT 2013 CNAR is due to CAS by March 31, 2014. The draft is comprised of the Overview ONLY (no executive sign-off required).

The FINAL 2013 CNAR is due to CAS by May 30, 2014. The final 2013 CNAR includes Part 1 Part 2 survey form and Overview.

The Self-Certification Checklist is due to CAS by May 15, 2014.

For more information about the Carbon Neutral Government process, please refer to *Becoming Carbon Neutral 2013*, or should you have any questions please contact climateactionsecretariat@gov.bc.ca.

Organization Name

Simon Fraser University

Actions Taken to Reduce Emissions

1) Stationary Fuel Combustion, Electricity (Buildings):

Indicate which actions were taken in 2013:

Performed energy retrofits on existing buildings

Yes

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

No

Undertook an evaluation of overall building energy use.

Yes

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

In 2013, SFU Senior Administration also created a \$1M Sustainable Utilities Revolving Fund (SURF) for energy and water efficiency projects over the next 4 years. Cost savings return to SURF to support future rounds of investments. The first SURF-funded project was the replacement of older lighting with LEDS in the Academic Quadrangle concourse; this project is expected to have a 3.4-year payback period.

2) Mobile Fleet Combustion (Fleet and other vehicles):

Indicate which actions were taken in 2013:

Do you have a fleet?

Yes

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

Yes

Replaced existing vehicles with hybrid or electric vehicles

No

Reduced the overall number of fleet vehicles

No

Took steps to drive less than last year

Yes

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

Facilities Services' Mechanical Section continues to perform scheduled preventative maintenance (since 1995) of the Facilities Operations vehicle fleet every 6 months.

As vehicles are retired, they are replaced, on an as-needed basis, with more fuel-efficient, right-sized vehicles that meet operational requirements. SFU continues to look in to options to shrink the size of the fleet where possible.

Drivers are encouraged to only carry necessary cargo/equipment on trips to increase fuel efficiency of vehicles.

Four specialized electric vehicles were purchased for Facilities Services (low speed at max. 40km/h and low range at 20km), but performance of the vehicles was determined to be unsuitable because of battery life and the grades (steepness) of the Burnaby campus and these electric vehicles are no longer part of the fleet.

3) Supplies (Paper):

Indicate which actions were taken in 2013:

Used less paper than previous year

Yes

Used only 100% recycled paper

No

Used some recycled paper

Yes

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

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

- *Began offering an 80% tree-free (wheat-based) office paper as an alternative to recycled content paper through SFU's internal supplier, Document Solutions.*

Actions Taken to Reduce Emissions - continued

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

- *Continue to implement projects identified through the BC Hydro Continuous Optimization Program (C-Op).*
- *Extend the C-Op program to another 3 buildings: Blusson Hall, Saywell Hall, and Discovery 1.*
- *Continue to implement lighting and building retrofits, particularly through the SURF fund and Carbon Neutral Capital Program (CNCP).*
- *Continue to support the certification of laboratories and departments through the Green Labs and Green Office Certification Programs.*
- *Rollout the Zero Waste Initiative, replacing all waste bins in public spaces with four-stream Zero Waste Stations in order to move towards SFU's goal of 70% waste diversion by 2015 (despite these emissions being out of Scope)*
- *Prepare detailed action plans for the SFU Sustainability Strategic Plan.*
- *Expand the Sustainability Peers Program through on-campus partnerships.*
- *Establish campaigns to increase sustainable procurement for office supplies.*
- *Pilot four video-conferencing courses in the two new lecture recording theatres during the 2014 winter semester.*
- *Expand community outreach efforts through social media to encourage everyday behaviours that can help to reduce energy waste.*
- *In the long term, continue building a comprehensive calculation of the carbon footprint of the university to include Scope 3 emissions in key areas of organizational impact such as commuter travel and waste.*
- *Expand on the Energy System Engineering Program in a new building in Surrey Campus.*

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

Yes

Actions to Promote Sustainability and Conservation - Optional

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

Business Travel

Created a low-carbon travel policy or travel reduction goal (Low-carbon: Lowest emission of greenhouse gases per kilometre per passenger)

No

Virtual Meeting Technology

Installed web-conferencing software (e.g., Live Meeting, Elluminate, etc.)

Yes

Made desktop web-cameras available to staff

Yes

Encourage alternative travel to meetings (e.g., bicycles, public transit, walking)

Yes

Encourage carpooling to meetings

Yes

Education and Awareness

Have created Green, Sustainability, Energy Conservation, or Climate Action Teams.

Yes

Provided resources and/or dedicated staff to support these teams

Yes

Provided behaviour change education/training for these teams (e.g., community-based social marketing)

Yes

Established a sustainability/green awards or recognition program

Yes

Support green professional development (e.g., workshops, conferences, training)

Yes

Planning for Climate Change

Have assessed whether extreme weather events and/or long term changes in climate will affect our organization's business areas

No

Long term changes in climate have been incorporated into our organization's decision making.

No

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Actions to Promote Sustainability and Conservation - Optional (continued)

Staff Awareness and Education

Provided education to staff about the science of climate change

Yes

Provided education to staff about the conservation of water, energy, and raw materials

Yes

Provided green tips on staff website or in newsletters

Yes

Alternate Work/Commuting Options

Allow for telework/working from home

Yes

Staff have the option of a compressed work week

Yes

Commuting by foot, bicycle, carpool or public transit is encouraged

Yes

Shower or locker facilities are provided for staff/students who commute by foot or by bicycle

Yes

Secure bicycle storage is provided

Yes

Other Sustainability Actions

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

No

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

No

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

Yes

Have implemented a hazardous waste reduction and disposal strategy (Hazardous Waste: E.g., electronics including computer parts and monitors, batteries, paints, fluorescent bulbs)

Yes

Have incorporated minimum recycled content standards into procurement policy for consumable, non-paper supplies (e.g., writing instruments, binders, toner cartridges, etc.)

No

Established green standards for goods that are replaced infrequently and/or may require capital funds to purchase (e.g., office furniture, carpeting, etc.)

No

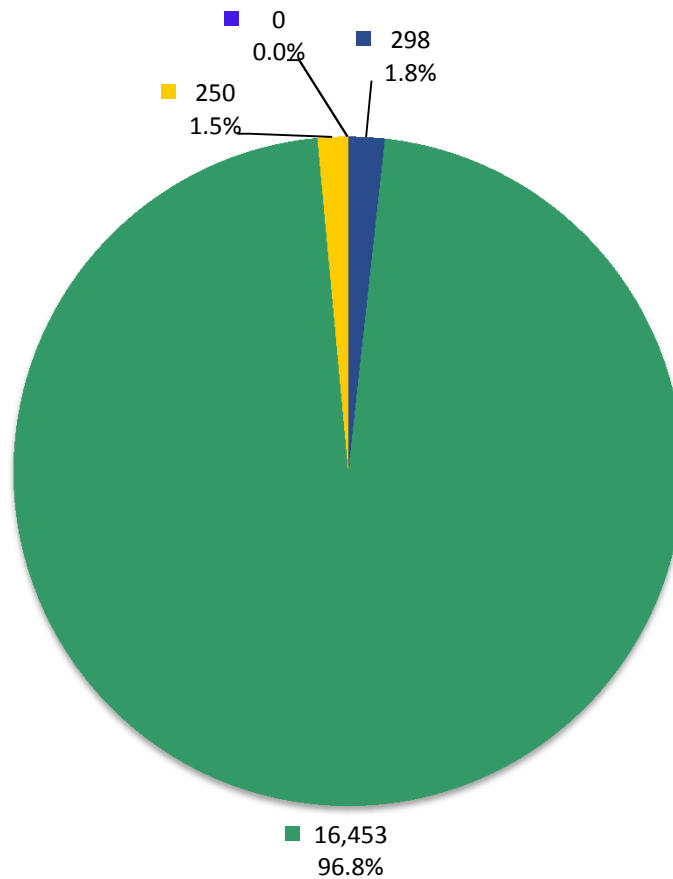
Incorporated lifecycle costing into new construction or renovations

No

Please list and other sustainability actions you wish to report not included in the previous list.

- *The Sustainability Office in partnership with Sustainable SFU (student-led not-for-profit), Career Services, Faculty of Environment and SFU Pacific Institute for Climate Solutions hosted Sustainability Opportunities Week, providing students with opportunities to explore how sustainability could be integrated into all types of career paths, volunteer work, or educational pursuits.*
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- *Aerators were installed on sink faucets in the washrooms in Strand Hall, Discovery 2 and West Mall*

Simon Fraser University Greenhouse Gas Emissions by Source for the 2013 Calendar Year (tCO₂e*)



Total Emissions: 17,001

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

Offsets Applied to Become Carbon Neutral in 2013 (Generated May 21, 2014 3:02 PM)

Total offsets required: **16,991**. Total offset investment: **\$424,775**. Emissions which do not require offsets: **10** **

*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.