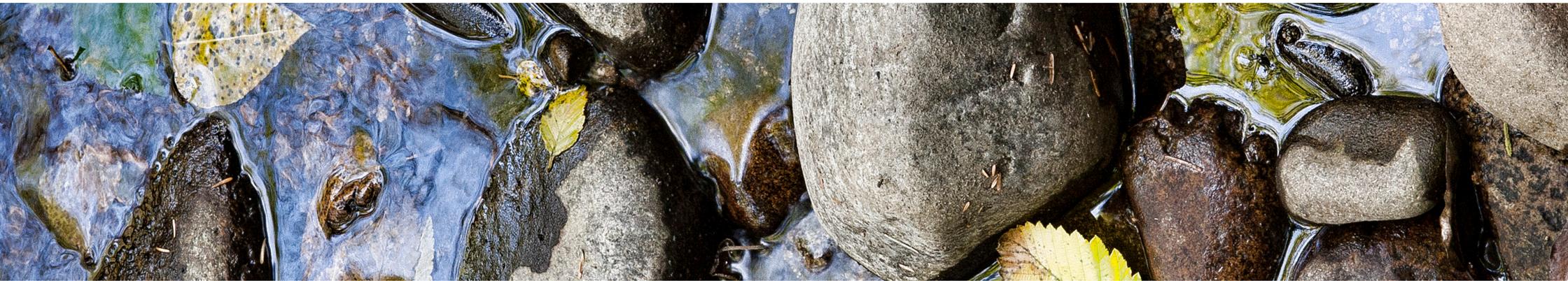




2011

carbon neutral action report

SIMON FRASER UNIVERSITY



ACKNOWLEDGEMENTS

This report was produced by Simon Fraser University. It supplements the Carbon Neutral Action Template and 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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2011

CARBON NEUTRAL ACTION REPORT



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1.0 EXECUTIVE SUMMARY

2011 was a strong year for energy conservation action, sustainability initiatives and partnership building at SFU.

Ongoing capital projects implemented through Facilities Services and support from a wide-ranging program of sustainability initiatives, helped reduce SFU's greenhouse gas emissions by 4% lower than 2007 levels, despite a 13% increase in total campus area over that period.

Several major capital projects were completed in 2011:

- a \$50M Shrum Chemistry Renew at SFU Burnaby;
- a \$10M Podium 2 Expansion at SFU Surrey; and
- the opening of the Goldcorp School for Contemporary Arts at SFU Vancouver

Two of these projects have applied for LEED Gold certification. For existing

buildings, Facilities Services completed certification of 25 core institutional buildings under the BOMA BEST rating system, with most buildings achieving Level 2 or above. Under the Energy Management program, several energy efficiency projects were carried out across the Burnaby campus and 6 more buildings were recommissioned through the BC Hydro Continuous Optimization Program.

SFU continued discussions with partners SFU Community Trust and Corix Utilities to co-develop a new biomass-fuelled district energy system that would supply enough heat energy for SFU Burnaby Campus as well as new residential buildings in the UniverCity residential community.

The campus community was also engaged in energy conservation efforts through behavior change programs such as the Green Labs energy conservation program (now in Year 2) and the deployment of building energy dashboards that display real time energy performance.



The creation of joint Building Energy Committees (in SSC and SSB) of building users, facilities operations staff and sustainability support staff has also been a successful model for ongoing dialogue on ways to improve building energy performance.

Engagement efforts were strengthened in 2011 with the formation of the SFU Sustainability Network, with founding partners comprised of the Sustainability Advisory Committee, Facilities Services, Pacific Institute for Climate Solutions (PICS), Sustainable SFU, and the Faculty of Environment. The Network aims to be a communications portal to support the diverse sustainability activities around the university and to engage the community in sustainability action.

Institutional funding support allowed new programs to be launched or expanded, including the implementation of a campus-wide composting program on the Burnaby campus, a reusable take out container exchange program for dining facilities on campus, and the Green Office certification program for staff, implemented through the Sustainability Ambassadors network.

Institution-wide, SFU advanced its sustainability goals as articulated in its Sustainability Policy GP 38, with the Northwest Commission on Colleges and Universities (NWCCU) accreditation process which added sustainability indicators as institutional measures, and with sustainability articulated as part of SFU's [Strategic Vision](#).

2.0 2011 GREENHOUSE GAS EMISSIONS

In 2011, total (absolute) GHG emissions for SFU were 18,670 tCO₂e*. Emissions increased 5% compared to 2010 due at least in part to the 6% increase in building area. However, emissions remain approximately 4% lower than the baseline set in 2007. Overall, the university physical space has increased 13% since 2007 (see Figure 1).

2.1 OFFSETS APPLIED TO BECOME CARBON NEUTRAL IN 2011

In 2011, as reported in Smart Tool, SFU purchased 18,660 tonnes of carbon offsets from Pacific Carbon Trust (\$466,500 at \$25/tonne). Due to initial calculation errors, an overpayment of carbon offsets was made in 2011, which will be reconciled in the 2012 CNAR report.

Nine tCO₂e of carbon dioxide emissions from the combustion of biomass fuels were reported as part of our total greenhouse gas emissions profile in 2011. However, as stated in Methodology for Reporting B.C. Public Sector Greenhouse Gas Emissions Version 2.0, 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



SOURCE	2007 (tCO ₂ e) BASELINE YEAR*	2010 (tCO ₂ e)**	2011 (tCO ₂ e)** CURRENT YEAR
Buildings – Stationary Fuel Combustion	18,113	17,079	18,052
Fleet – Mobile Fuel Combustion	940	288	283
Paper – Office Supplies	357	337	334
Total Emissions Calendar Year	19,410	17,796	18,670**

FIGURE 1

Simon Fraser University Greenhouse Gas Emissions by Source per Year

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

Following the public release of Simon Fraser’s 2010 Carbon Neutral Action Report, it was determined that the total emissions for the 2010 calendar year were over reported by 221 tonnes CO₂e and offsets required to become carbon neutral in 2010 were over reported by 221 tonnes CO₂e (\$5,500). The surplus of offsets purchased in 2010 will be applied against our 2012 emissions.

In 2011, the total building area of the university grew by 6% with the Podium 2 expansion on the Surrey campus, Discovery I on the Burnaby campus and the new Goldcorp Centre for the Arts on the Vancouver campus. Shrum Chemistry Renew on the Burnaby campus did not add significantly to total building area.

3.0 ACTIONS TAKEN TO REDUCE GREENHOUSE GAS EMISSIONS IN 2011

Maintaining emission levels at 4% lower than the 2007 baseline year while the university is expanding is challenging. The continued success can be attributed to the adoption of high performance standards for energy efficiency in new projects and the long-standing active energy management program at SFU in retrofitting existing older buildings.

Through the systematic implementation of energy saving opportunities, Facilities Services continues to carefully manage the retrofitting of older systems with more energy-efficient technologies. These retrofit projects worked together with behaviour change programs to help foster a culture of sustainable practices that support emission reduction, energy conservation and sustainability.

*2007 baseline set from Willis Energy: SFU GHG Inventory

**2010 and 2011 values as reported in SMARTTool. Please note that for simplicity, values with decimals have been rounded off. The actual total for emissions is 18,669.53 tCO₂e.

conservation projects and initiatives ongoing/completed in 2011 under the Energy Management program include upgrades to convert lighting to LED fixtures in lecture theatres, parkades and parking lots, and occupancy sensors installed in public areas such as hallways and washrooms

Facilities Services was also able to optimize systems in 6 more buildings (AQ, Gym, MBC, WMC, TASC 1 and TASC 2) through the BC Hydro Continuous Optimization Program. Real time building energy dashboards are now available online for many SFU Burnaby buildings and displayed in public kiosks.

Other achievements in 2011 include:

- Certification of 25 buildings on Burnaby campus to BOMA BEST (on average the campus is level 2 certified)
- Implemented an Energy Ideas contest (Kill-a-Watt) to generate fresh energy saving ideas from the university community (winning projects to be implemented in 2012)
- Creation of Building Energy Committees in 2 existing buildings
- Ongoing internal support for energy management through monthly meeting of the Energy Committee to regularly review energy performance and generate new ideas for energy savings
- In partnership with BC Hydro, launched Green Labs Year 2 expansion into Shrum Chemistry building and a two-week energy reduction competition between buildings (Shrum Chemistry and SSB)

Work on the \$50 M Shrum Chemistry major renewal capital project, which began in 2009, was completed in 2011. This project has applied for gold certification from Leadership in Engineering and Environmental Design (LEED). Also completed in 2011 was the major capital project of Podium 2 Expansion on the Surrey campus, which also applied for LEED gold certification.

In April 2011, Premier Christy Clark announced provincial funding for a new biomass energy plant at SFU. \$4.7 million in funding will be provided to support the partnership between SFU, the SFU Community Trust and Corix Utilities to build a proposed district energy system for Burnaby campus and UniverCity. The proposed high efficiency heating plant will use woody biomass from construction wood waste as the primary fuel source. Discussions and plans for the plant continued through 2011, and it remains an important capital project initiative to reduce GHG emissions.

4.0 PLANS TO CONTINUE REDUCING GREENHOUSE GAS EMISSIONS: 2012 - 2014

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

- Continue to implement projects identified through the Continuous Optimization Program
- Continue to expand the Green Labs Program
- Continue to develop Green Building standards for design, construction and operations
- Continue to implement lighting upgrades during renovations; replace parkades and parking pole lights to LED, and convert more lecture theatres to LED
- Continue to implement Continuous Optimization projects in more buildings (Library and Shrum Sciences under study)
- Continue to conduct energy assessments through the Commercial Energy Assessment program
- Construction of the biomass heating plant in partnership with the Community Trust and Corix Utilities
- Develop a sustainability strategy (including a climate action plan) to articulate short, medium and long term goals
- Launch the new Sustainability Network website and increase the number of Network partners

- Continue to strengthen sustainability partnerships across campus
- Draft a long-term Transportation Strategy that focuses on commuters and travel between SFU campuses
- Establish a searchable database of sustainability research and sustainability-related courses offered at SFU
- Integrate concept of Campus as a Living Lab into sustainability curriculum
- Establish long term funding strategy for sustainability activities and initiatives at SFU

5.0 ACTIONS TAKEN TO ADVANCE SUSTAINABILITY & CARBON NEUTRALITY

2011 was a landmark year for sustainability initiatives across the 3 SFU campuses. Increased staffing for the Sustainability Team allowed for the deployment of several events, initiatives and programs that have actively engaged the campus community, and help make progress towards achieving carbon neutrality and a more sustainable campus overall.

an innovative

container exchange program was created to encourage students, faculty and staff to use reusable containers when buying food on campus. Multiple food vendor outlets on campus participated in the program, contributing to its early success.

The plans to expand the container exchange program in the coming academic year include providing containers as part of new student orientation, as well as launching another promotion campaign to increase awareness of the program.

The Zero Waste Committee was busy planning for the launch of the “Zero Waste SFU” program, which will significantly reduce waste sent to landfills by adding composting and more advanced recycling options to management of the waste stream.

Numerous events were held throughout the year to support energy conservation. National Sweater Day in February saved the university just over \$1,000 in energy savings, 2 Bike to Work Weeks and celebration events promoted alternative transportation to both the Burnaby and Vancouver campuses, and the Sustainability Festival in September showcased the achievements in sustainability practices of both the campus and surrounding municipalities.

The ongoing Sustainability Ambassadors program held two “Lunch and Learn” events in 2011. The Ambassadors were key promoters for the Green Office certification program, which continues to be implemented by departments across campus.

6.0 PROMOTING A CULTURE OF SUSTAINABILITY AT SFU

As listed by the actions above, sustainability at SFU extends far beyond reducing greenhouse gas emissions. Promoting a culture of sustainability has been an important part of the SFU community for many years. Groups representing staff, students, and faculty have been initiating programs and engagement activities since the early 1980s.

In 2003, the student organization Sustainable SFU (funded by students and run as a non-profit organization beginning in 2009) initiated a collaboration with SFU administration to create the Sustainability Advisory Committee and developed programs to increase student awareness of sustainability as a value through initiatives such as the Local Food Project (including a weekly Pocket Farmer’s Market), the Sustainability Festival and the Sustainable Campuses Conference.

The Sustainability Advisory Committee, whose members include administrative, staff, faculty and student representatives, has made culture change, community engagement and organizational learning a priority in its sustainability strategic planning. This committee was crucial in the



development of SFU's sustainability policy (GP 38) and the creation of a full-time staff member position to coordinate activities on campus.

During 2011, many initiatives began or were completed to promote a strong culture of sustainability at SFU. Along with the university's adopted Sustainability Policy, sustainability is articulated as an underlying principle in SFU's strategic vision to be the leading engaged university.

While many challenges remain, we are committed to reduce our GHG emissions through carbon reduction action, as well as advance a profound sense of importance and culture of sustainability throughout the university community. Below are a few examples of our efforts.

6.1 BEHAVIOUR CHANGE: THE GREEN LABS PROGRAM

Buildings with science labs are often the greatest consumers of energy on campuses. The Green Labs program at SFU was expanded in 2011 to include the newly renovated Shrum Chemistry Centre. To help SFU achieve an overall goal of 2% energy reduction per year, this program encourages lab users to take certain actions to reduce energy consumption, such as shutting fume hood sashes, turning off lights and adopting energy-efficient freezer procedures.

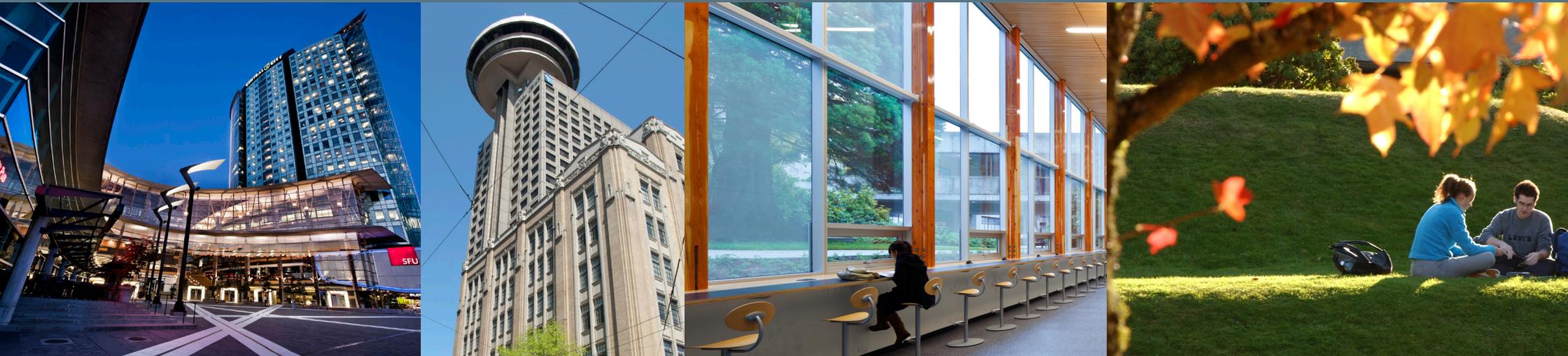
The program includes the use of energy dashboards to display real time energy performance and the creation of Energy Committees for each building to provide leadership and support to building occupants for ways to continue to reduce energy use. For more information, please see:

www.sfu.ca/sustainability/campus/initiatives/energy/green-labs

6.2 COMMUNITY ENGAGEMENT: KILL-A-WATT CONTEST

In September 2011, Facilities Services launched the "Kill-a-Watt: My Big Energy Saving Idea Contest," with the goal of engaging the SFU community in helping to reduce the university's electricity and natural gas consumption in campus buildings. Individuals and small teams were encouraged and invited to submit an energy saving idea (including a problem statement, estimated costs and references) to Facilities Services staff by the end of 2011.

Criteria for project selection was based on creativity, cost effectiveness, and how well it supported SFU's sustainability policy. The 3 winners were announced in early 2012, and the implementation of some of the energy savings projects commenced in summer 2012.



6.3 SUSTAINABLE BUILDINGS: SHRUM CHEMISTRY CENTRE

In 2011, the \$50M renewal of the Shrum Chemistry building on Burnaby campus was completed. This major renewal capital project incorporated high performance energy management technologies such as low flow fume hoods and direct digital controls for air conditioning and lighting systems.



6.4 CAMPUS OPERATIONS: IT SERVICES VIRTUAL TECHNOLOGY & POWER MANAGEMENT

As SFU has three campuses throughout Metro Vancouver, the availability and effective use of virtual meeting technology is becoming increasingly important. IT Services initiated a three-month pilot program with easy-to-use web conferencing software known as Blue Jeans Network. Several workshops were held throughout the pilot to provide information and training to staff and faculty in all departments at the different campuses. The pilot was

a success as it has now been extended to a one-year pilot program.

Also, steps to improve the power efficiency of the IT equipment began in late 2011 and early 2012. For example, 21 older CRT TV's used university-wide by staff, students and faculty were replaced with energy-efficient LED LCD screens. All CRT TV's are expected to be replaced by LED LCD screens by the end of 2012.

7.0 APPENDIX

(A) 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 (as of 12/31/11)	PERFORMANCE TO DATE (as of 12/31/11)	STEPS TAKEN IN 2011	STEPS PLANNED FOR 2012 - 2014	START YEAR	END YEAR	
MOBILE FUEL COMBUSTION (FLEET AND OTHER MOBILE EQUIPMENT)							
Vehicle Fuel Efficiency							
Replace vehicles with more fuel-efficient models	Ongoing/In Progress		Purchased a fourth electric van as part of the fleet to replace a gasoline powered older van	FS does not plan to purchase more electric vehicles due to unsatisfactory performance of the ones previously purchased	2008	No End Date (Continuous)	
Replace larger vehicles with smaller models according to fleet "right-sizing" principles	Ongoing/In Progress		No significant action was taken this year	Intent to retire a number of full-size gas powered cargo vans and replace with smaller "Ford Transit" size cargo vans	2012	2014	
Perform regular fleet maintenance specifically to improve fuel-efficiency	Ongoing/In Progress	100	% of vehicles are subject to regular maintenance for fuel efficiency	For Facilities Services fleet, an ongoing preventative maintenance program takes place at least twice a year	Continue regular scheduled maintenance program for fleet	Started before 1995	No End Date (Continuous)
Replace small maintenance vehicles with more fuel-efficient models	Ongoing/In Progress		Facilities Services' fleet primarily consists of vans and small 1T trucks and some specialty vehicles (snow ploughs, etc.). The fleet management strategy is to retire/replace the 2 oldest vehicles every year to optimize fuel efficiency of the fleet. Vehicles older than 10 years are generally considered less fuel efficient.	Continue to monitor fleet operations closely to optimize fleet size and mix and downsize where possible	Started before 1995	No End Date (Continuous)	



ACTION	STATUS (as of 12/31/11)		PERFORMANCE TO DATE (as of 12/31/11)	STEPS TAKEN IN 2011	STEPS PLANNED FOR 2012 - 2014	START YEAR	END YEAR
Behaviour Change Program							
Provide fleet driver training to reduce fuel use	In Development			Collaborated with risk management to draft section of drivers manual pertaining to climate change and the importance of anti-idling that will be found in every vehicle on campus	Include curriculum on fuel efficiency in all fleet driver training. Train 100% of drivers by the end of 2013.	2011	2013
Introduce anti-idling policy and/or raise anti-idling awareness for fleet drivers (e.g., signs, stickers, messages)	In Development			Working with risk management to draft section of drivers manual pertaining to climate change and the importance of anti-idling that will be found in every vehicle on campus	Create an anti-idling policy for the university complete with appropriate communications and knowledge dissemination to fleet drivers, contractors, delivery vehicles and haulers (signage, stickers, messages) by the end of 2013	2011	2013
Encourage carpooling in fleet vehicles	Ongoing/In Progress			Met with Facilities Services supervisions during reporting process to inquire about the feasibility of carpooling as a policy for vehicle use	Continue to work with supervisors and operations managers to encourage carpooling in fleet vehicles	2011	2013
Promote alternatives to fleet vehicle travel where possible (e.g., bicycles, public transit, walking)	Ongoing/In Progress			Organized a Bike to Work Week for the SFU Burnaby campus in May and another in October at the Harbour Centre campus in downtown Vancouver. Held a "celebration station" that included maps, prizes, and free snacks to encourage staff, students and faculty to bike.	Work with supervisors and operations managers to encourage alternatives to vehicle travel wherever possible. Plan another Bike to Work Week Event at both campuses for May 2012.	2011	No End Date (Continuous)
STATIONARY FUEL COMBUSTION, ELECTRICITY AND FUGITIVE EMISSIONS (BUILDINGS)							
Planning / Management							
Enroll in a building energy benchmarking program (e.g., GREEN UP)	Ongoing/In Progress	25	buildings have received BOMA BEST certification	Enrolled 25 buildings for BOMA BEST certification on the SFU Burnaby campus: greenbuildingsfoundation.org	Enroll with APPA for energy benchmarking program	2008	No End Date (Continuous)



ACTION	STATUS (as of 12/31/11)	PERFORMANCE TO DATE (as of 12/31/11)		STEPS TAKEN IN 2011	STEPS PLANNED FOR 2012 - 2014	START YEAR	END YEAR
Install a real time metering system (e.g. Pulse, Reliable Controls, Houle Controls)	Ongoing/In Progress	80	% of buildings have a real time metering system installed	<p>Connected 5 more buildings (TASC 1, TASC 2, WMC, MBC and Shrum Centre) into the Building Energy Dashboard display system:</p> <p>http://my.pulseenergy.com/sfu/dashboard</p> <p>Also, Identified buildings that did not yet have energy meters to develop a plan for meters to be installed.</p>	Connect 8 more buildings (Library, Saywell, Blusson, Shrum K, Shrum P, Shrum B, RCB, and EB) into the Building Energy Dashboard display system	2012	No End Date (Continuous)
Owned Buildings							
Establish energy performance baseline for owned buildings	Ongoing/In Progress			Expanded energy database by collecting and separating out energy consumption data for every building to set benchmark and allow performance of individual buildings to be looked at in more detail	Continue to monitor and track energy performance of individual buildings against established benchmark	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	60	% of owned buildings have operations and maintenance labelling/certification	<p>Applied for BOMA BEST certification for 25 buildings on the SFU Burnaby campus:</p> <p>greenbuildingsfoundation.org</p>	25 buildings obtained BOMA BEST Certification	2011	2014
Register for performance labelling/certification for commercial interiors of owned buildings (e.g., LEED CI)	Ongoing/In Progress	1	% of commercial interiors in owned buildings have labelling	<p>4,500 m² on Surrey campus will be fitted out for science teaching space reusing existing building components and refurbished lab casework. Finishes are low emitting with high recycled content.</p> <p>Labs have low flow fume hood exhausts to save energy and local vacuum units to reduce water aspirator use. Washrooms have also been retrofitted with water efficient fixtures. The project has applied for certification LEED CI Gold.</p>	Continue to enhance energy management systems at Surrey campus	2010	No End Date (Continuous)



ACTION	STATUS (as of 12/31/11)	PERFORMANCE TO DATE (as of 12/31/11)		STEPS TAKEN IN 2011	STEPS PLANNED FOR 2012 - 2014	START YEAR	END YEAR
Achieve LEED NC Gold certification at a minimum for new construction or major renovations	Ongoing/In Progress	0	% of owned buildings are certified LEED NC Gold or LEED NC Platinum	Shrum Chemistry (Major Renew \$50 M capital project) reopened in September 2011. Documentation has been sent CAGBC aiming for LEED Gold certification.	Submit LEED documentation to CaGBC for LEED certification	2009	No End Date (Continuous)
Incorporate integrated design process into new construction or during renovations of owned buildings	Ongoing/In Progress	0	% of buildings built or renovated since start year indicated used the integrated design process	Planning for new project to adapt to new process	New major projects to adapt to Integrated Design Process	2012	No End Date (Continuous)
Incorporate a refrigerant management strategy into regular building management/maintenance to reduce fugitive emissions	Ongoing/In Progress			Record of refrigerant usage are tracked by SFU A/C Department and Refrigeration Contractors. This is part of the ongoing maintenance procedures.	Same management plan & strategy carry forward	2000	2014
Perform energy retrofits on existing, owned buildings	Ongoing/In Progress	25	% of owned buildings have undergone energy retrofits since start year indicated	8 buildings have implemented energy projects identified in BC Hydro Continuous Optimization Program. In 2011, emphasis was placed on Monitoring and Tracking energy performance for the 8 buildings.	Extend BC Hydro C-Op program to other buildings	2008	No End Date (Continuous)
Retrofitting Owned Buildings							
Upgrade mechanical systems (heating, cooling, ventilation) during retrofits	Ongoing/In Progress			Through the Continuous Optimization Program, energy retrofits including upgrades to mechanical systems, were ongoing in 2 more buildings (AQ and Gym)	Major mechanical upgrade planned for AQ (south west 5000 level)	2002	No End Date (Continuous)
Upgrade lighting systems during retrofits	Ongoing/In Progress	50	% of retrofits since start year indicated had lighting systems upgrades	Replaced light fixtures with new high efficiency type; replaced some outdoor parking light fixtures and other exterior fixtures with LED type; converted lecture halls from incandescent to screw-in LED with new dimmers; installed motion sensors in offices, classrooms and washrooms	More lighting upgrades during renos; lighting upgrade in other parkade to LED; conversion of most of the parking pole lights to LED; more lecture hall conversion to LED. Identify and provide budgets for retrofits.	2009	No End Date (Continuous)



ACTION	STATUS (as of 12/31/11)	PERFORMANCE TO DATE (as of 12/31/11)		STEPS TAKEN IN 2011	STEPS PLANNED FOR 2012 - 2014	START YEAR	END YEAR
Upgrade/adjust control systems during retrofits	Ongoing/In Progress	20	% of retrofits since start year indicated had control system upgrades or adjustments	Connected low voltage lighting relay systems in several buildings, including SHRUM Chemistry, to the building automation system to enable central monitoring and control	Connect more building's lighting control to the building automation system; install more daylight photocell control. Identify and provide budgets for retrofits.	2008	No End Date (Continuous)
Improve building insulation (including windows) during retrofits	Ongoing/In Progress			Windows replaced on 53 units in ASB Atrium	Where funding allows, continue to replace windows (some single glazed). Continue major renovation of AQ lecture theatre roofs, including insulation.	2009	No End Date (Continuous)
Install an on-site renewable energy demonstration project	Completed in 2011			There are 2 renewable energy demonstration projects: solar thermal heating and solar photovoltaic. Monitored the efficiency and performance of the projects.	Conduct feasibility study for renewable energy projects	2008	No End Date (Continuous)
IT Power Management							
Install power management software which shuts down computers outside of regular business hours	In Development			Piloted software that will allow users to shutdown their computers	Deploy the tools which will shutdown Windows PCs outside of business hours in Administration units. A similar scheme will be developed for Apple Macintosh computers and deployed in 2012/14.	2010	2014
Implement server virtualization	Ongoing/In Progress	80	% of servers have been virtualized since start year indicated	Central IT Services servers have been virtualized	More virtualization for central IT. Provide on demand load management - consolidate virtual machines.	2009	2014
Apply auto-sleep settings on computer monitors and CPUs	Ongoing/In Progress	100	% of computers have auto-sleep settings applied	100% monitors have auto-sleep, all lab computers are powered off. 80% of admin computers have auto-sleep turned on.	In development: implement power off capability for all computers	2008	2011
Remove stand-alone printers, copiers, and/or fax machines and install multi-function devices	Ongoing/In Progress	15	% reduction in printers, copiers, and/or fax machines since start year indicated	Main project to do this is underway. Expect completion in 2013.	Reduce number of network and standalone printers, fax machines and scanners significantly	2011	2013
Replace computers with ENERGY STAR models during regular computer upgrades	Ongoing/In Progress	80	% of computers are ENERGY STAR rated	All computer purchases are ENERGY STAR compliant	Any specialized old computers which are still in use will be replaced as they fail	2009	2014



ACTION	STATUS (as of 12/31/11)	PERFORMANCE TO DATE (as of 12/31/11)		STEPS TAKEN IN 2011	STEPS PLANNED FOR 2012 - 2014	START YEAR	END YEAR
Appliances and Electronic Devices							
Replace refrigerators with ENERGY STAR models or source ENERGY STAR models for future purchases	Ongoing/In Progress			Replace end of life refrigerators with ENERGY STAR equipment when available in all residences. Difficult to track Energy appliances in other departments.	Continue to incorporate ENERGY STAR into future RFPs	2009	No End Date (Continuous)
Replace other appliances or electronic devices with ENERGY STAR models or source ENERGY STAR models for future purchases	In Development				Continue to incorporate into future RFPs wherever feasible. Expand Green office Program to all 3 campuses.	2009	No End Date (Continuous)
Replace desk lamp incandescent bulbs with compact fluorescent (CFL) bulbs or source more efficient desk lamps for future purchases	Ongoing/In Progress	80	% of desk incandescent lamps replaced with compact fluorescents	Replace burnt out lamps with CFL lamps. In residences, replaced end of life 32W lamps with 28w lamps.	Continue to replace end of life 32W lamps with 28W lamps. Expand Green office Program to all 3 campuses	2003	No End Date (Continuous)
Behaviour Change Program							
Help staff reduce personal energy use through "workstation tune-ups"	Ongoing/In Progress	20	% of current staff have completed a workstation tune-up	The 'Green Office Program' was piloted with a network of ~30 Sustainability Ambassadors in 2011. As a result, ~20 offices have been certified as either green, silver, gold or platinum offices by addressing energy efficiency and waste issues.	The Green Office Program is to be launched to the entire campus community in 2012. This will encourage more offices to become aware of energy efficiency and waste.	2011	2012
Ask staff to unplug electrical equipment or switch off power bars when not in use	Ongoing/In Progress	2	science departments signed up for the Green Labs Program	This is part of the Green Office Program mentioned above as well as an ask in the Green Labs Program (partner with BC Hydro Workplace Conservation Awareness). Also, posters were created to remind people to unplug electrical equipment when not in use.	Expansion of Green Labs Program to other buildings	2011	No End Date (Continuous)



ACTION	STATUS (as of 12/31/11)	PERFORMANCE TO DATE (as of 12/31/11)		STEPS TAKEN IN 2011	STEPS PLANNED FOR 2012 - 2014	START YEAR	END YEAR
Ask staff to close blinds at end of work day to reduce heating/cooling demands	Ongoing/In Progress			Actions are part of development of Green Office and Green Labs Programs for Burnaby campus. The Programs give credit and recognize offices/departments that take these actions.	Expansion of Green Office Program to all 3 campuses	2008	No End Date (Continuous)
Appliances and Electronic Devices							
Encourage use of stairs instead of elevators	In Development			This was one of the winning ideas in our recent Kill-a-Watt competition and will be developed in the coming months	SFU plans to launch a campaign encouraging people to use the stairs and avoid the elevators, to be completed by end of 2012	2011	2012
Provide reminders for turning off lights (e.g., signs, stickers, messages)	Ongoing/In Progress			Development of Green Office and Green Labs Programs for Burnaby campus. The Programs give credit and recognize offices/departments that take these actions. "Turn off the lights" stickers are placed throughout the campus, in offices, classrooms and meeting rooms.	Expansion of Green Office Program to all 3 campuses. Also, we will continue to place sticker prompts throughout the campus until every switch is labelled!	2008	No End Date (Continuous)
Promote hot water conservation	Ongoing/In Progress			A proposal was approved to have sink faucets switched over to low-flow	Renovations underway to have sink faucets replaced with low-flow faucets, which will save hot water	2011	2013
Other Stationary Fuel Combustion, Electricity, and Fugitive Emissions Actions							
Replace the existing gas-fired thermal energy plant with a biomass plant	Ongoing/In Progress			Conducted feasibility study and granted approval for PSECA funding	Continue to develop this project	2009	2014
New central servers (high performance clusters – HPC) are installed with rack cooling (more efficient) and new computer room is being built with rack cooling systems	Ongoing/In Progress			Main HPC has been installed with rack cooling. Developed plan for energy efficient new computer room.	Move computers from old (inefficient) computer room to efficient new computer room	2010	2014



ACTION	STATUS (as of 12/31/11)	PERFORMANCE TO DATE (as of 12/31/11)		STEPS TAKEN IN 2011	STEPS PLANNED FOR 2012 - 2014	START YEAR	END YEAR
Removed CRT TVs used by staff, students and faculty, and being replaced with LED LCDs (more efficient)	Ongoing/In Progress			21 CRTs were replaced with LED LCDs, 20 more units will be replaced in the coming year	Remove every CRT for digital signage throughout university. Goal is to replace all in the future.	2012	2014
Automatic shut down of all computers centrally managed, either with or without user action	In Development				Working on allowing users off campus to access their work computer remotely	2012	2013
Install an energy consumption display monitor in the public area	Ongoing/In Progress	1	building has an energy display unit (Shrum C)	Installed a real time energy display unit in the Shrum Chemistry Building	Real time energy displays will be installed in more buildings by 2014: Shrum B, K, and Physics, Library, RCB, Education, Saywell Hall, Blusson Hall and Strand Hall	2011	2014
Perform energy assessments	Ongoing/In Progress	14	buildings were studied since start year	Conducted energy assessments in 14 buildings through the Fortis BC Energy Assessment Programs to determine the opportunities for natural gas saving	Perform energy assessment for 14 more buildings	2011	2014
Other Stationary Fuel Combustion, Electricity, and Fugitive Emissions Actions							
Replace the boilers with high efficiency boilers	Ongoing/In Progress	2	is the number of boilers replaced	Replaced 2 old boilers with a condensing boiler and an ENERGY STAR boiler	Replace the aging boilers with more efficient model	2011	No End Date (Continuous)
Replace the faucet aerators with low flow for the campus	Ongoing/In Progress	15	% of buildings have aerators replacement since start year	Replaced the 2.2 gym aerators with 0.5 gym in the washrooms of 4 buildings	Replace the remaining high flow aerators with low-flow	2011	2014
SUPPLIES (PAPER)							
Paper Type							
Purchase 30% post-consumer recycled paper	Ongoing/In Progress	63	% of total paper purchased contains 30% recycled content	Promote use of 30% RC paper and reduced use of 100% bond paper	Continue to encourage use of post-consumer paper wherever possible. Plans to drop option for 100% bond paper for size, legal and tabloid choice from ordering online.	2008	2012



ACTION	STATUS (as of 12/31/11)	PERFORMANCE TO DATE (as of 12/31/11)		STEPS TAKEN IN 2011	STEPS PLANNED FOR 2012 - 2014	START YEAR	END YEAR
Purchase 100% post-consumer recycled paper	In Development				Plans to run a pilot program using 100% recycled post consumer paper in newer multi-function printers	2012	2013
Electronic Media in Place of Paper							
Install collaborative software for electronic editing (e.g. SharePoint, Groove, etc.)	Ongoing/In Progress	100	% of staff workstations with software installed	100% of computers have capability. Various solutions are in place and will be propagated as systems mature and processes are refined to take advantage of collaborative software. Example, HR now sends you softcopies of all resumes in Connect Documents, rather than printing each applicant's resume.	Continue to encourage departments to use collaborative software. Our plan is to help users reduce printing all together with a Web first policy.	2011	2014
Use electronic document library for filing common documents	Ongoing/In Progress			Connect documents, File servers and special document servers (Docushare, SharePoint, Adobe CQ) are available for use at the university. Everyone is encouraged to use the appropriate tools.	Raise awareness and encourage departments to use the tools. All departments are being assisted with using Adobe CQ as their repositories, where appropriate.	2009	2014
Behaviour Change Program							
Train staff to use collaborative software for electronic editing (e.g. SharePoint, Groove, etc.)	Completed in 2011			Ran 3 month pilot program with Blue Jeans Network to see how useful it was and if it was used often	Blue Jeans is now a 1 year pilot. Plans to make permanent (find funding). SFU uses this technology the most out of all universities in BC.	2011	2012
Other Paper Supplies Actions							
Payroll now provides an option to have T4 slips sent to employees electronically	Ongoing/In Progress			61% of employees accepted online access to their 2011 T4 slips	Continue to encourage this option every year and increase number of users	2012	No End Date (Continuous)

7.0 APPENDIX

(B) 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 organizations can optionally use this section to report on actions that will help British Columbia meet its provincial greenhouse gas reduction targets, engage the public, and improve environmental sustainability across all aspects of their organization.

ACTION	STATUS (as of 12/31/11)	PERFORMANCE TO DATE (as of 12/31/11)	STEPS TAKEN IN 2011	STEPS PLANNED FOR 2012 - 2014	START YEAR	END YEAR
BUSINESS TRAVEL						
Virtual Meeting Technology						
Install web-conferencing software (e.g., Live Meeting, Elluminate, etc.)	Ongoing/In Progress			Ran 3 month pilot program with Blue Jeans Network to see how useful it was and if it was used often	Blue Jeans is now a one year pilot. Plans to make permanent (find funding). SFU uses this technology the most out of all universities in BC.	2011 No End Date Continuous)
Make desktop web-cameras available to staff	Ongoing/In Progress	80	% of staff have access to a desktop web-camera	Mobile units are available (light version for easy video conferencing) for all to book and use. Many now have it on their computers as well.	Encourage the use of webcams and similar equipment for video conferencing through the Green Office Program and IT Services programs	2011 2014
Install video-conferencing units in meeting rooms or provide mobile video-conferencing units	Ongoing/In Progress	18	% of meeting rooms have access to video-conferencing equipment	More efficient (LED LCD screens) mobile video conferencing equipment made available for use from staff and faculty	Most centrally bookable meeting rooms will have some form of video conferencing capability. Starting in 2011, virtual classroom technology will be deployed as well.	2011 2014



ACTION	STATUS (as of 12/31/11)	PERFORMANCE TO DATE (as of 12/31/11)	STEPS TAKEN IN 2011	STEPS PLANNED FOR 2012 - 2014	START YEAR	END YEAR
Behaviour Change Program						
Train staff in web-conferencing	Ongoing/In Progress		Held several Blue Jeans Network training workshops throughout the year – invited staff from all departments	IT Services provides on site help for clients if need be	2011	2012
Train staff in video-conferencing or provide technical support for video-conferencing set-up	Ongoing/In Progress		In addition to the workshops, technical support for video conferencing is available at all times from IT Services	Continue to offer technical support when needed. User just need to contact IT Services.	2011	No End Date (Continuous)
Encourage carpooling to meetings	Ongoing/In Progress		Promoted as part of ongoing campaigns and support of carpooling	Continue to support carpooling	2008	No End Date (Continuous)
Encourage alternative travel to meetings (e.g., bicycles, public transit, walking)	Ongoing/In Progress		Promoted as part of ongoing campaigns (Green Office Program and Bike to Work Week)	Continue to support by undertaking feasibility studies of different transportation options to and from different SFU campuses. For example having a dedicated vehicle fleet, carpooling, transit passes, etc.	2008	No End Date (Continuous)
EDUCATION, AWARENESS, AND ENGAGEMENT						
Team-Building						
Create Green, Sustainability, Energy Conservation, or Climate Action Teams with executive endorsement	Ongoing/In Progress		Sustainability Ambassador (SA) program has been established for 3 years now. Participants need supervisor approval in order to participate.	We plan to recruit and grow the SA network at all three campuses in 2012. By the end of 2014, we would like to have at least one SA in each department.	2008	No End Date (Continuous)
Provide resources and/or dedicated staff to support teams	Ongoing/In Progress		There is one FTE responsible for coordinating activities related to sustainability. About 20% of this position is dedicated to the SA program.	We are hoping to be able to dedicate more coordination capacity to this project if funding is approved.	2008	No End Date (Continuous)



ACTION	STATUS (as of 12/31/11)	PERFORMANCE TO DATE (as of 12/31/11)		STEPS TAKEN IN 2011	STEPS PLANNED FOR 2012 - 2014	START YEAR	END YEAR
Providing behaviour change education/training to teams (e.g., community-based social marketing)	Ongoing/In Progress			Behaviour change training, based on CBSM strategies, are provided to SA's on a bi-annual basis	We plan to continue this CBSM approach to behaviour change campaigns and training	2008	No End Date (Continuous)
Awards/Recognition							
Establish a sustainability/green awards or recognition program	In Development			In 2011, the Sustainability Coordinator presented at the Western Washington University Sustainability Awards. This has spearheaded an interest in developing such an awards program at SFU.	We plan to host the first annual sustainability awards for staff, students, faculty and community members in March 2012	2012	No End Date (Continuous)
Staff Professional Development							
Support green professional development (e.g., workshops, conferences, training)	Ongoing/In Progress			SFU Sustainability staff have had the opportunity to gain professional development at AASHE 2011, PowerSmart Forum, CAS Green Team Workshops, Canadian Universities for Responsible Investment Workshops	SFU Sustainability will continue to provide staff with professional development opportunities in 2012 and beyond	2008	No End Date (Continuous)
Staff Awareness / Education							
Provide education to staff about the science of climate change	Ongoing/In Progress			We work with the Pacific Institute for Climate Solutions (PICS) coordinator to advertise monthly educational events related to climate change. These events are open to staff, faculty and students.	We will continue to support PICS events	2010	No End Date (Continuous)
Provide education to staff about the conservation of water, energy, and raw materials	Ongoing/In Progress			Through the SA program, we have educated a handful of staff on conservation issues	In 2012, we will be focusing on waste through introducing expanded recycling and composting programs at SFU	2008	No End Date (Continuous)
Provide green tips on staff website or in newsletters	Ongoing/In Progress			Green Tips are available online	With the launch of a new website in 2012, we will highlight green tips and include a 'tip of the week' on our homepage	2008	No End Date (Continuous)



ACTION	STATUS (as of 12/31/11)	PERFORMANCE TO DATE (as of 12/31/11)		STEPS TAKEN IN 2011	STEPS PLANNED FOR 2012 - 2014	START YEAR	END YEAR
Provide sustainability education during new staff orientation	Ongoing/In Progress			Sustainability Education is provided at new staff orientation monthly	We would like to expand the allotted time from 10 to 15 minutes in 2012	2008	No End Date (Continuous)
Client / Public Awareness / Education							
Provide education to clients/public about the science of climate change	Ongoing/In Progress			We work with the Pacific Institute for Climate Solutions (PICS) Coordinator to advertise monthly educational events related to climate change. These events are open to staff, faculty and students.	We will continue to support PICS events	2010	No End Date (Continuous)
Provide education to clients/public about the conservation of water, energy, and raw materials	Ongoing/In Progress			Our Green Labs program focuses on disseminating this type of information to faculty and students in lab buildings	This program will expand to all lab buildings by the end of 2014	2010	2011
Provide green tips on client/public website or in newsletters	Ongoing/In Progress			Green Tips are available online	With the launch of a new website in 2012, we will highlight green tips and include a 'tip of the week' on our homepage	2008	No End Date (Continuous)
Other Education, Awareness, and Engagement Actions							
Annual Sustainability Festival	Ongoing/In Progress			The Sustainability Festival is an annual event which seeks to bring together staff, students, faculty and community members to learn about sustainability: www.sfu.ca/sustainabilityfestival	In 2012, we hope to expand the one day festival to a week-long event and include all three campuses	2005	No End Date (Continuous)
National Sweater Day	Ongoing/In Progress			SFU participated in the WWF National Sweater day in 2011 and 2012	We plan to participate in this event again in future years	2011	No End Date (Continuous)
Support the Do It in the Dark Competition to encourage SFU Residence and Housing to save energy	Ongoing/In Progress	100	% of the residence buildings participated	Participated in this event and encouraged student support by providing energy saving tips	Continue to support this event	2011	No End Date (Continuous)



ACTION	STATUS (as of 12/31/11)	PERFORMANCE TO DATE (as of 12/31/11)		STEPS TAKEN IN 2011	STEPS PLANNED FOR 2012 - 2014	START YEAR	END YEAR
Organize energy saving idea contest to collect ideas from the SFU community	Ongoing/In Progress	46	energy saving ideas received in 2011	Organized and promoted the competition and committed to implement the winning ideas	Continue to organize and promote the competition	2011	No End Date (Continuous)
Initiate green lab behaviour program to encourage lab occupants to conserve energy	Ongoing/In Progress	2	buildings are participating in the Green Labs Program (Shrum C and South Science Building)	Formed an energy committee with the lab users and provided tools and educational material to help them save energy	Expand the program to other lab buildings	2010	No End Date (Continuous)
OTHER SUSTAINABILITY ACTIONS							
Water Conservation							
Establish a water conservation strategy which includes a plan or policy for replacing water fixtures with efficient models	Ongoing/In Progress			Replaced existing high-flow aerators with low-flow in all washrooms in 6 buildings (Shrum K,P,B,C, TASC 1 and 2, ASB, SSB, and the library)	Will continue to replace all existing aerators with low-flow. Also, partnering with FortisBC to replace most of the pre-rinse spray valves in the kitchens with the low flow fixtures.	2011	No End Date (Continuous)
Introduce a stormwater management landscape strategy (e.g., vegetated roofs, permeable paving, rain gardens, bioswales)	Ongoing/In Progress			Monitor performance of vegetated roof on Blusson/Saywell Hall to evaluate performance and ways to improve system. Majority of campus is not irrigated. Native Plant material throughout the campus have been selected to reduce need for irrigation.	Document applicable standards into Green Building Design Standards	2009	2013
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			SFU has established a Zero Waste Committee and has worked throughout 2011 to increase infrastructure which will allow occupants to divert waste more effectively. We hope to match the Metro Van goals of diverting waste by 70% by 2020: www.sfu.ca/sustainability/campus/initiatives/waste/committee.html	Expanded recycling and composting were introduced to SFU in early 2012. This was accompanied by a large-scale education campaign and a Sustainability Ambassador campaign. We hope to continue to expand waste diversion infrastructure.	2011	No End Date (Continuous)



ACTION	STATUS (as of 12/31/11)	PERFORMANCE TO DATE (as of 12/31/11)	STEPS TAKEN IN 2011	STEPS PLANNED FOR 2012 - 2014	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		Held discussions with current vendors. Obtained data.	Competitive bid for stationery supplies in progress during 2011	2011	2013
Establish green standards for goods that are replaced infrequently and/or may require capital funds to purchase (e.g., office furniture, carpeting, etc.)	In Development		Facilities committee determines standards. Discussion has taken place. For example, Interface carpet tiles used in buildings are 100% recyclable. Continue to use Calstone Furniture because of strong environmental programs including take back of used furniture to build new furniture.	Follow up with discussion and develop formal documentation – product evaluation/justification that would include sustainable considerations	2012	No End Date (Continuous)
Implement sustainable purchasing program for cleaning products, disposable paper products and trash bags	Ongoing/In Progress		Discussion has taken place with Vendor. Documentation has been provided.	Janitorial compliance data to be monitored and reported by Facilities. Procurement to follow up with Vendor if contract issue arises.	2012	No End Date (Continuous)
Require a minimum purchase of sustainable, and organic food and beverages supplied by contracted food suppliers or caterers	In Development		SFU is in the process of applying for Fair Trade Campus designation	We hope to be awarded this designation in 2012	2011	2012
Building Construction, Renovation, and Leasing						
Establish a policy to reuse materials where possible and divert construction and demolition debris from landfills and incineration facilities	In Development			Incorporate into project development Standard Practices wherever possible	2009	No End Date (Continuous)



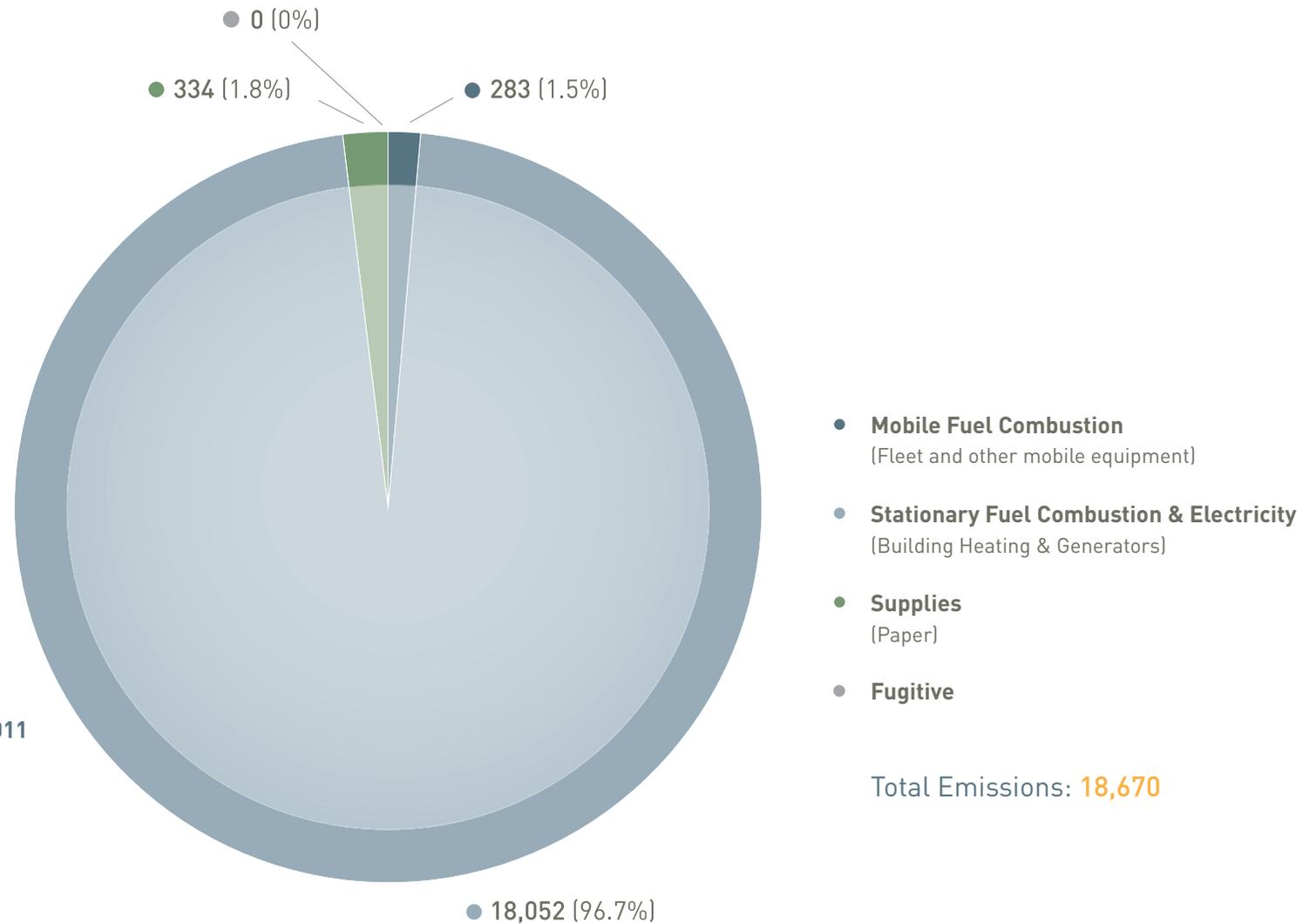
ACTION	STATUS (as of 12/31/11)	PERFORMANCE TO DATE (as of 12/31/11)		STEPS TAKEN IN 2011	STEPS PLANNED FOR 2012 - 2014	START YEAR	END YEAR
Incorporate lifecycle costing into new construction or renovations	In Development				<p>Continue to investigate principles to explore life cycle costing, although these principles are already used in the design and construction of buildings whenever possible.</p> <p>Provide training to other departments for applying life cycle costing in evaluating between equipment choices.</p>	2011	No End Date (Continuous)
Indoor Air Quality							
Incorporate low volatile organic compounds (VOCs) standards into procurement policy for products such as paints, carpets, and furniture	Ongoing/In Progress			Implemented in Shrum Chemistry Major Renew project	Review performance to evaluate and adopt where feasible	2009	No End Date (Continuous)
Commuting to and from Home							
Encourage commuting by foot, bicycle, carpool or public transit	Ongoing/In Progress			Green Office Program promotes this action. Also, buses are equipped with bike carriers and in summer more people ride the bus up and their bikes down. Each area of campus is served by bicycle storage.	Continue to expand as part of the Green Office Program. Work with Ancillary Services on a Transportation Strategy that focuses on alternative modes of transportation. Continue to organize Bike to Work Weeks biannually with The HUB.	2009	No End Date (Continuous)
Provide secure bicycle storage	In Development				Continue to expand cycling infrastructure with secured bike storage on Burnaby campus. Consider business partnerships with bike locker service providers.	2009	No End Date (Continuous)
Modify parking fees or parking availability for staff/students	Ongoing/In Progress			Parking rates continue to be increased for staff and students	Encourage carpooling and ride share programs or public transit. Continue to reduce available parking while increasing rates.	2008	No End Date (Continuous)



ACTION	STATUS (as of 12/31/11)	PERFORMANCE TO DATE (as of 12/31/11)	STEPS TAKEN IN 2011	STEPS PLANNED FOR 2012 - 2014	START YEAR	END YEAR
Other Sustainability Actions						
Charter member of the AASHE STARS program to evaluate overall sustainability measures	Ongoing/In Progress		<p>SFU is now a charter member of STARS.</p> <p>Sustainability Coordinator, staff and faculty attended STARS conference in Pittsburg in October 2011, bringing back helpful material for implementing and enhancing sustainability initiatives.</p>	<p>Collecting data and submitting data as part of the program.</p> <p>Using STARS headings and indicators to encourage better collection of data on campus and better integration of sustainability indicators into SFU Accreditation process, strategic plans and budgets.</p>	2010	No End Date (Continuous)

7.0 APPENDIX

(C) Greenhouse Gas Emissions by Source for the 2011 Calendar Year (tCO₂e)



Offsets Applied to Become Carbon Neutral in 2011

Total offsets required: **18,660**

Total offset investment: **\$466,500**

Emissions which do not require offsets: **9***

*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.