



CARBON NEUTRAL ACTION REPORT 2019

SIMON FRASER UNIVERSITY

SFU



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ACKNOWLEDGEMENTS

CONTRIBUTORS (SFU'S CARBON NEUTRAL GOVERNMENT DATA AND REPORTING)

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DECLARATION STATEMENT

This Carbon Neutral Action Report for the period January 1, 2019 to December 31, 2019 summarizes SFU's emissions profile, the total offsets to reach net-zero emissions, the actions taken in 2019 to reduce greenhouse gas (GHG) emissions and plans to continue reducing emissions in 2020 and beyond. By June 30, 2020 Simon Fraser University's final 2019 Carbon Neutral Action Report will be posted to the website at <https://www.sfu.ca/fs/projects-initiatives/sustainable-initiatives/ghg-emissions/carbon-neutral-action-reports.html>.

OVERVIEW

At the time of writing this report SFU is unable to comment on the data trends for its 2019 GHG emissions, given the context of COVID-19 and the corresponding provincial Directive, issued on 31st March 2020. There were many actions taken, and continued, in 2019 to maintain a reduction in SFU's GHG emissions.

Examples of actions taken to minimize emissions included:

- The completion of the Sustainable Energy and Engineering building on the Surrey campus, built to LEED Gold standard (pending certification);
- Upgrading building control systems to integrate more buildings at the Burnaby campus in the direct digital control (DDC) system, to enable greater oversight and energy conservation; and
- Promoting energy saving behaviours through campaigns such as the BC Cool Campus Challenge.

Examples of plans to continue reducing emissions in 2020 and beyond include:

- Launching SFU's Strategic Sustainability Plan (2020-2025) to accelerate climate action and reduce GHG emissions across the university;
- Completing and operationalizing the biomass heating plant on the Burnaby campus; and
- Increasing the number of fleet electric vehicles, and the electrical vehicle charging infrastructure.

For more information, see pages 3 to 11.

EMISSIONS AND OFFSET SUMMARY TABLE

SFU GHG EMISSIONS AND OFFSETS FOR 2019 (tCO₂e)

As per the [directive](#) issued March 31, 2020, each PSO will use their 2018 GHG Emissions as a placeholder for the purposes of their 2019 CNAR.

Total Emissions (tCO ₂ e)	14,687
Total BioCO ₂	11
Total Offsets (tCO ₂ e)	14,676
Offset Investment (\$25 per tCO ₂ e)	\$366,900 (excluding GST)

EXECUTIVE SIGN-OFF



May 26, 2020

Signature

Date

Martin Pochurko

Vice-President, Finance & Administration

Name

Title

RETIREMENT OF OFFSETS*

In accordance with the requirements of the Climate Change Accountability Act and Carbon Neutral Government Regulation, Simon Fraser University (the Organization) is responsible for arranging for the retirement of the offsets obligation reported above for the 2019 calendar year, together with any adjustments reported for past calendar years (if applicable). The Organization hereby agrees that, in exchange for the Ministry of Environment and Climate Change Strategy (the Ministry) ensuring that these offsets are retired on the Organization's behalf, the Organization will pay within 30 days, the associated invoice to be issued by the Ministry in an amount equal to \$25 per tonne of offsets retired on its behalf plus GST.

*Retirement of offsets refers to purchasing the appropriate amount of BC carbon offsets, to compensate for (offset) SFU's remaining GHG emissions, therefore effectively removing (retiring) those offsets from the carbon market. This paragraph is mandated by the province.

1.0 ACTIONS TAKEN TO REDUCE GREENHOUSE GAS EMISSIONS IN 2019

1.1 BUILDING EMISSIONS

Planning for reductions

SFU is approaching the end of its five-year Strategic Energy Management Plan (SEMP), in place from 2016/17 to 2020/21. The SEMP includes targets to reduce energy consumption by 2% per year and to shifting 70% of SFU's fossil-fuel based energy to renewables by 2020, via renewable biomass and low carbon electrification. Progress in the SEMP action areas is detailed in the subsequent sections of this report.

New buildings and major renewal of existing buildings

In 2019, SFU continued to apply the best practices recommended in its Owner's Technical Requirements (OTR) to new buildings, construction and renewals on its campuses. The OTR include green building principles relating to energy efficiency, sustainable design and site drainage specifications.

Classrooms upgrade, AQ 4000

SFU transformed the classrooms in the AQ 4000 level to flexible, integrated and connected spaces. Both the building envelope and lighting system were upgraded to meet current building codes.

Surrey Sustainable Energy and Engineering (SEE) building

The new SEE building was completed in time for classes to commence in the Fall 2019. The SEE building houses Mechatronics labs and a new Sustainable Energy and Environmental Engineering program in Surrey, one of BC's fastest



External view of the new Surrey Sustainable Energy and Engineering Building.

growing municipalities. Over 800 students, faculty and staff are now utilizing the 20,458 square meter facility. The building is under review for LEED Gold certification and is a living showcase for sustainable building standards.

Water Tower Building success story

The Burnaby Water Tower Building, dynamic glazing and heat recovery chiller project was completed in 2019. This was an innovative climate mitigation and adaptation project that improved the occupants' comfort while reducing the GHG emissions. Previously a BC Hydro site which maintained water pressure for fire protection systems across the campus, the building is now the central location for SFU's data centre. Without a cooling system, the south façade of the building receives a lot of sun, and the inside temperature can reach 35

degrees Celsius, making the occupants uncomfortable. In addition, the boiler and chiller serving the 16,000 square foot office area were approaching end of life. This provided the opportunity to implement an innovative approach, to improve occupant comfort and system reliability, while reducing the energy consumption and GHG emissions. The single glazed system was upgraded to dynamic glazing (a glazing system that can adjust tint automatically, to optimize the inside temperature). This, coupled with thermally broken window frames, significantly reduced the cooling and heating demand of the building. A heat recovery chiller system was designed and tied to the data centre condenser system to recover heat for space heating, thus further reducing the GHG emissions.



External view of SFU's Water Tower building on SFU's Burnaby Campus.

Energy efficiency and conservation projects

Lighting

SFU has a university-wide lighting and LED retrofit program which continued in 2019. The Burnaby retrofits focused on core buildings. The Technology and Science Complex 1 (TASC 1) fixtures were upgraded to LEDs and dimming features were installed via wireless controls. Pot lights in the hallways and common areas of West Mall Complex were replaced with LEDs. Lights in the Kinesiology and Chemistry wings of the Shrum Science Building were also upgraded to LEDs.

Building control systems upgrades

The condition assessment of building metering and control infrastructure at SFU Burnaby that began in 2018 was completed. Upgrades are now being implemented in a number of major buildings. The building control system in the Halpern Centre was upgraded and integrated in the campus-wide DDC system, to enable greater oversight and energy conservation. SFU continued to replace obsolete pneumatic controls and heating valves with new electronic controls systems, to reduce heat leakage and therefore improve energy conservation. These efforts were focused on the Applied Science Building, WAC Bennett Library, and Shrum Sciences buildings.

Building recommissioning

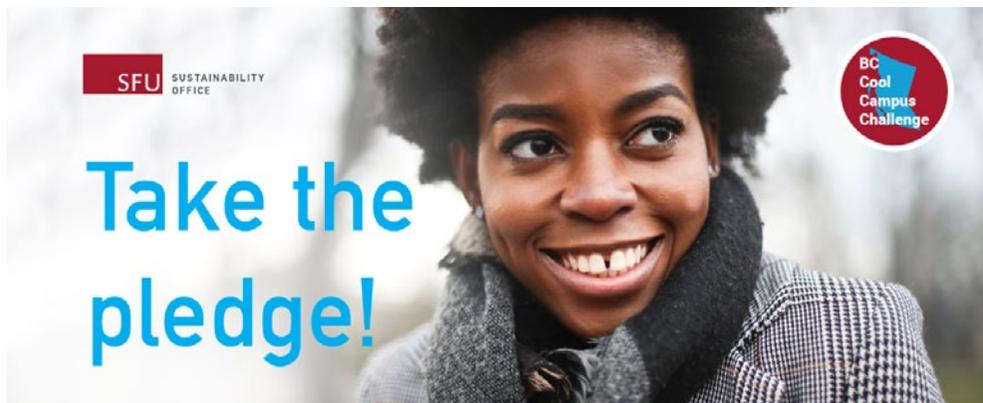
Continuous optimization of the building automation system in the Applied Sciences Building, South Science Building, and TASC 1 was conducted to assess energy performance and the potential for improving operations and sequencing of their mechanical equipment. Energy studies were conducted at the Academic Quadrangle, Lorne Davies Complex, and West Mall Complex for an overview of the systems' current status, and feasibility to operate the facilities more efficiently.

Behaviour change

Sustainable Spaces

Sustainable Spaces, launched in 2017, recognizes and celebrates ecological, economic and social sustainability efforts in different spaces at SFU. There are four certification streams: Sustainable Offices, Sustainable Labs, Sustainable Dining and Sustainable Events; and three levels of certification: Gold, Silver, and Bronze. The Sustainable Spaces program provides a framework for offices, labs, food vendors and event organizers to reduce GHG emissions through a variety of physical and behavioural changes, including: temperature monitoring, seeking naturally-lit meeting rooms, and purchasing energy efficient lab equipment.

102 Sustainable Spaces were certified in 2019 - mostly Sustainable Events (96 certified) across SFU's three campuses. Approximately 36,190 participants were engaged in the sustainability efforts made by event organizers. Six offices, with 135 staff in total, were also certified in 2019. This included the certification of one extremely passionate office external to SFU.



Promotional graphic for the BC Cool Campus Challenge featuring a person dressed in winter clothes and call-out text saying "Take the pledge!".

BC Cool Campus Challenge

The BC Cool Campus Challenge was launched in 2019 as a fun and friendly province-wide energy conservation challenge, led by five post-secondary institutions including SFU. The goal of the campaign was to reduce energy consumption, climate impact, and demonstrate climate leadership. Connected to SFU's participation in the Energy Wise Network, it was the first cross-institution, energy saving collaboration of its kind in British Columbia. The Challenge campaign ran from January to February 2019. Students, staff and faculty were encouraged to reduce their energy consumption at work and at home through pledging to take four simple actions:

- Turning down the heat between 1 and 3 degrees Celsius;
- Layering up in warmer clothing;
- Taking shorter showers; and
- Washing clothes in cold water.

441 SFU community members signed up to the Cool Campus Pledge and made a commitment to reduce their energy use on campus, and beyond.

SFU lowered its temperature setpoints across all three campuses to 20 degrees Celsius. As a result, SFU saved an estimated 260 GJ of energy, with an equivalent cost of approximately \$3,740, by lowering its thermostats. The Challenge also contributed to SFU reducing its GHG emissions by 13 tons CO_{2e}.

Re-use for Good, GoGreen reusable container pilot

In September 2019, SFU launched its bold Re-use for Good initiative, which aims to reduce single-use plastics and disposable products (SUPPs) while introducing reusable alternatives. The programs within the initiative are focused on moving towards a circular economy. There are notable lifecycle GHG emissions savings associated with reducing the number of SUPPs on campus. As part of Re-use for Good, SFU implemented a pilot of the GoGreen reusable container program (in September 2019) to decrease the number of disposable food containers used each day. Since the program was implemented, approximately 3,500 single-use containers and 9,699 pieces of single-use cutlery have been diverted from landfill, through use of the GoGreen reusable containers and reusable metal cutlery.

Other behaviour change programs

The Energy Management Team organized two lunch and learn sessions on climate adaptation for the Facilities Services staff, to understand more about the terminology, impacts and relevance to the university's policy planning and services.



A Dining Services staff member completing a to-go order using a GoGreen container instead of a disposable single-use container.

1.2 FLEET EMISSIONS

Electric vehicles

In 2019, SFU continued an ongoing eight-year plan to replace older engine model vehicles with new, more fuel-efficient vehicles. SFU is gradually transitioning towards more owned or leased electric vehicles in its fleet. IT Services operate a Mitsubishi i-MiEV for Network Services technicians to travel across campus and move networking equipment. In 2019 Safety & Risk Services purchased a Nissan Leaf.

Electric vehicle infrastructure

SFU continued to increase its capacity for electric vehicle charging in 2019, with the installation of four Level 2 charging stations at the Surrey campus. There are six Level 2 charging stations and 42 Level 1 chargers installed at the Burnaby campus. The Level 1 chargers were chosen as an economical option to install more outlets. They use 'smart outlets' to display charging and energy usage data, and are suitable for SFU community users who park on campus for a full day.

1.3 PAPER EMISSIONS

In 2019 Document Solutions, SFU's print and digital services department, continued to offer sustainable print solutions. Actions continued, or taken, in 2019 included:

- Printing all standard jobs on FSC certified paper with at least 30% post-consumer waste content (approximately 90% of all orders), unless specialty stocks were requested;
- Minimizing paper wastage during production and processing;
- Reducing large format laminating and mounting by printing directly to rigid media including metal, plastic and fabric;
- Decommissioning the shrink-wrapper and using paper binding as an alternative;
- Recommending green options for meeting and event materials, such as biodegradable name badge holders; and
- Coordinating recycling of toner cartridges for Ricoh MFD operations for SFU Print (IT Services).

The volume of paper consumption at SFU reduced with the introduction of more efficient Ricoh multifunction printers in 2018. In addition, the volume of paper ordered through SFU's Central Stores has decreased as more departments order directly from Staples. Alternative fiber copy papers, such as sugar and wheat, were negotiated as part of the BC Net Staples Office Supplies agreement. These have been promoted to SFU users at the Eway checkout. Many SFU users ordering paper supplies from Staples have selected more sustainable options including FSC certified and paper containing 30% post-consumer recycled content.

2.0 PLANS TO CONTINUE REDUCING GREENHOUSE GAS EMISSIONS

2.1 BUILDING EMISSIONS

Planning for reductions

SFU is beginning to make plans to wrap up the existing SEMP and establish new plans for energy efficiency and renewable energy at the university beyond 2020/21.

SFU will release its Strategic Sustainability Plan (2020-2025) at the beginning of 2020. The plan will mobilize the institution to address the climate crisis. The plan will focus on reducing SFU's GHG emissions, through operational, Living Lab and climate leadership goals. Some individual targets will be aligned to the scope of the Carbon Neutral Government; whilst others will address more sources of SFU's scope 3 emissions.

New buildings and major renewal of existing buildings

Student Union Building (under construction, due to be completed in 2020)

The new 10,300 square metre, \$55 million Student Union will house student clubs, a community kitchen, and other inclusive spaces to meet the needs of the diverse student population. The building will have on-site storm water storage and a high-performance building envelope. The project is on target to achieve LEED Gold certification.

Strand Hall (under renewal, due to be completed in 2020)

Major renovations are in progress in Strand Hall (third floor). The work includes improving the building envelope and HVAC system, including a low

carbon electrification system. The renovation work will improve the building's energy efficiency and comfort for occupants.

Lorne Davies Complex Stadium (under construction, due to be completed in 2020)

Construction of a new SFU grandstand and outdoor football stadium, adjoining the south face of the Lorne Davies Complex, began in 2019. The development plans incorporate optimal energy performance, readiness for a net zero energy roof (with rooftop photovoltaic arrays) and water conservation measures.

Biomass heating plant (under construction, due to be completed in 2020)

The Burnaby Mountain District Energy Utility project will provide high efficiency, low carbon energy (using biomass, from waste wood chips) for the Burnaby campus and UniverCity residents. On completion the project will reduce up to 80% of the Burnaby GHG emissions, as biomass will replace the majority of natural gas consumption to heat the campus. The project is a collaboration between SFU, the SFU Community Trust and Corix Utilities.



Digital rendering of the upcoming biomass heating plant.

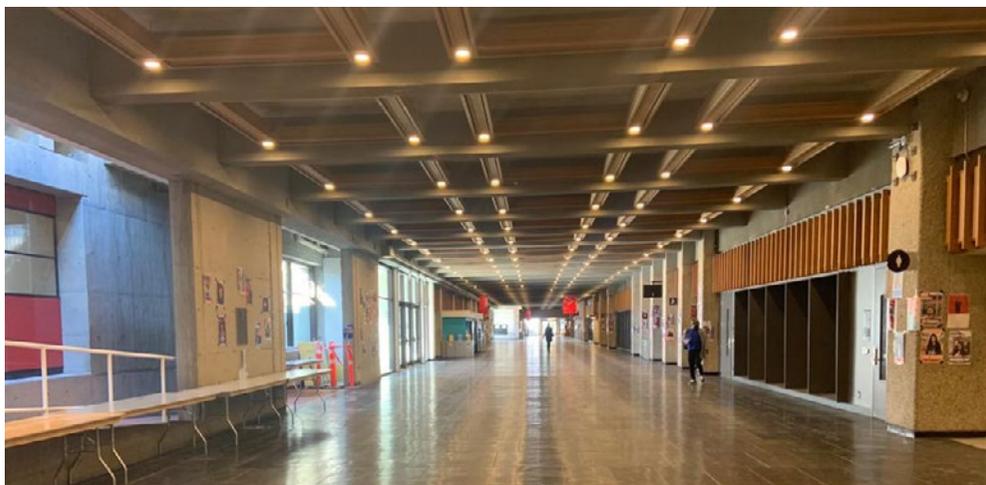
Convocation mall (under renewal, due to be completed in 2020)

Major renewal of the plaza is underway to replace the waterproofing assembly of the roof slab over the Central Parkade to extend its service life. The project will also refresh the space famously used for graduation ceremonies. SFU successfully upgraded the exterior downlights with new lights that will meet both safety and energy efficiency requirements.

New residence buildings (under construction, due to be completed in 2022)

This major project will provide more affordable housing and services for Burnaby students on campus. The construction of two new residential towers is currently underway in the student residences precinct, to provide 482 rooms for first year students. The energy efficient design supports the province's CleanBC strategy. The Residence towers are targeted to achieve LEED Gold certification.

Expansion of the Residence Dining Hall, to take the dining commons from a 256-seat to 800-seat facility, is also underway.



Picture of new LED lights down an Academic Quadrangle hallway.

Energy efficiency and conservation projects

A number of SFU's energy efficiency and conservation projects are ongoing.

Lighting

SFU will continue its LED replacement strategy across the university, in buildings and areas which have not yet received LED upgrades. The target is for all campus lighting to be LED by 2025. Buildings that will be worked on from 2020 include:

- Academic Quadrangle (including implementation of dual technology sensor controls for the 3000 level);
- West Gym, Fitness Centre, washrooms, and common areas at the Lorne Davies Complex;
- Exterior tunnel driveway and interior common areas at the Maggie Benston Centre;
- Halpern Centre; and
- TASC 2 building.

At the SFU Vancouver Campus, several fluorescent lights currently on manual control will be replaced with LED fixtures. This upgrade includes occupancy sensor controls in all rooms to further improve energy efficiency. These upgrades will take place in areas of the Harbour Centre and the Segal Building.

Equipment upgrades

SFU will continue the ongoing boiler replacements, for example replacing the furnace in Facilities Services on the Burnaby campus. Additional boiler upgrades are also planned for Discovery 2, SFU residences and the greenhouse. SFU is actively pursuing opportunities to implement low carbon electrification throughout the Burnaby campus. This will ensure that the university can maintain operations and support onsite research projects with a clean and

reliable power source. Where feasible, replacing natural gas units with electrical equipment will help meet growing power demands, while reducing the GHG emissions. Transitioning away from fossil fuel heat sources to electrical heat pumps will provide dual function heating and cooling for all occupants; lowering SFU's carbon footprint while future-proofing the university to be adaptable and resilient to the impacts of the changing climate. Inlet vanes that control the air flow entering the Applied Science Building will be replaced with variable frequency drives to allow better control of the fans, as needed.

Heating, ventilation and air conditioning (HVAC)

SFU will continue the ongoing optimization of HVAC systems in the Shrum Chemistry building, specifically the newly adjusted speeds of the Strobic exhaust fans that allow for optimal speed with wind speed and direction, while still meeting safe indoor air quality standards. SFU is looking at the feasibility of applying this technology in Blusson Hall, Saywell Hall, TASC 1 and TASC 2.

Building control systems upgrades

SFU will continue with major DDC system upgrades by:

- Replacing the existing pneumatic heating valve controls for the air handling units in the WAC Bennett Library with electronically actuated valves;
- Replacing the existing Facilities Services control system to consolidate the building into one program; and
- Adding controls to the mechanical rooms in the Applied Science Building.

These upgrades will connect all buildings with the campus-wide DDC system, for increased operational efficiency and reliability.

Behaviour change

Many of the existing behaviour change programs are ongoing or run on an annual basis. Sustainable Spaces will continue at all three campuses. Stakeholders will be engaged through launch events, lunch and learns, and strategic campaigns to maximize participation and GHG emissions reduction efforts. The BC Cool Campus challenge will also run again with other post-secondary institutions. Re-use for Good will continue to roll out at SFU, with planned actions including: expanding the GoGreen program, improving dishwashing infrastructure, addressing single-use coffee pods in offices and complying with the City of Vancouver plastics reductions and surcharge policies on hot and cold beverages.



Two students pictured with Re-use for Good reusable water bottles.

Safe & Sustainable Labs Campaign

As a result of a labs smart screens and metering pilot in 2017-18, there will be a targeted approach to engaging lab occupants in energy saving at the Burnaby campus in 2020. Utilizing the dashboard attached to the Inorganic and Organic Chemistry research spaces, the campaign will track energy consumption, while raising awareness about consumption through a behaviour change competition. Actions will include powering down equipment that is not in use, and lowering the sash to the appropriate level, to see which lab can save the most power. The campaign will work with lab managers, researchers and students, to identify key areas of improvement in both energy consumption and lab safety. It will run in conjunction with SFU's participation in the Energy Wise Network.



Todd Gattinger and Candace Le Roy using one of SFU's EV charging stations.

2.2 FLEET EMISSIONS

The upcoming Strategic Sustainability Plan (2020-2025) will include targets and strategies to reduce GHG emissions from fleet vehicles and commuting transportation.

Electric vehicles

SFU is moving towards a lease model for its fleet vehicles. This will support increasing the number of electric vehicles in the fleet. There are plans to lease electric and hybrid vehicles in 2020, for Facilities Services and Safety & Risk Services. The rate at which fleet vehicles can be replaced with electric vehicles will depend on the market availability and cost of comparable electric vehicles, such as light-duty trucks or medium-duty vehicles.

Electric vehicle infrastructure

SFU is working to expand its charging infrastructure to facilitate the use of electric vehicles, for fleet vehicles and more widely for SFU community users commuting to its campuses. SFU plans to install a Level 2 charging station for the Safety & Risk Services fleet electric vehicle in 2020.

2.3 PAPER EMISSIONS

SFU will continue to promote 'greener' choices for paper consumption, for example through Document Solutions and at the Eway checkout for Staples orders. Document Solutions and Procurement will also continue to work with vendors to explore eco-friendly options with lower associated GHG emissions. Other actions that will be taken across the university include certain departments adopting DocuSign for electronic agreements, to avoid printing.



Confirmation number: 00C0E467

Submitted date: 2020-05-27 10:10:43 Pacific Daylight Time

Carbon Neutral Action Report Survey - 2019

Public sector organizations (PSOs) are required to complete this survey, in addition to a Carbon Neutral Action Report (CNAR) as mandated by BC's [Climate Change Accountability Act](#) and the [Carbon Neutral Government Regulation](#).

Due to the COVID-19 pandemic, the following [Directive](#) was issued on March 31, 2020. Certain deadlines were also extended for the 2019 reporting year (see below).

March 31, 2020 Directive:

Under my authority as the Director for the purposes of the Act, and under the authority delegated to me in Section 6 of the Carbon Neutral Government Regulation, I hereby direct that all ministries and Public Sector Organizations covered by the Carbon Neutral Government requirement shall use their 2018 GHG emissions as a temporary estimate for their actual 2019 GHG emissions, for the purposes of the 2019 Carbon Neutral Action Reports and 2019 Carbon Neutral Government reporting required under the Climate Change Accountability Act.

Neil Dobson, Executive Director, Clean BC Implementation
Climate Action Secretariat

Although 2018 emissions data will be used as a placeholder for 2019, **all other (qualitative) components of the CNAR and CNAR Survey are to be completed with information from 2019 (e.g., actions taken or planned to reduce emissions)**. The only change to the survey is that the deadline was extended by one month to June 30, 2020.

This survey is divided into two parts:

Part 1 - Will be made public on the Climate Action Secretariat (CAS) [website](#) after June 30, 2020; however, it will not be appended directly to each individual PSO CNAR as was done in previous years. This section collects details about actions taken or planned to reduce emissions and is intended to supplement the legislative requirements in your CNAR.

Part 2 - Will NOT be made public. Information you provide in this section is important and will be used internally to help CAS staff with planning for emissions reduction and climate change adaptation initiatives. Although not required, PSOs are highly encouraged to complete Part 2.

Note: Survey progress can be saved at any time by clicking the "Save and continue later" button at the bottom of each page. A new window will open and you will be asked to provide your name and email. An email will be sent to you from Carbon.Neutral@gov.bc.ca with the subject line: "Questionnaire Link", which will include a hyperlink for the "Project: Carbon Neutral Action Report Survey – Broader Public Sector 2019". You can then continue responding at another time or email the hyperlink to a colleague to complete remaining section(s).

May 29, 2020	<ul style="list-style-type: none">The final, signed version of the CNAR (or Small Emitters Form) must be submitted by email to: Carbon.Neutral@gov.bc.ca
June 30, 2020*	<ul style="list-style-type: none">Ministry of Environment and Climate Change Strategy must post a final CNAR for each organization on the BC Government's CNG website and each PSO is encouraged to post the report on their website.The CNAR Survey (optional for Small Emitters) must be completed and submitted online. *Deadline extended from May 29, 2020.<u>All offset invoice payments must be submitted to CAS.</u>
Sept 30, 2020*	<ul style="list-style-type: none">Clean Government Reporting Tool (CGRT) Data Entry must be completed for the 2019 reporting year.

	*Deadline extended from April 30, 2020.
Oct 15, 2020*	<ul style="list-style-type: none"> • Self-Certification checklist must be completed, signed and submitted by email to: Carbon.Neutral@gov.bc.ca. *Deadline extended from May 15, 2020.

*See the [Carbon Neutral Government – Program Requirements website](#) for more information on program requirements, timelines and templates.

PART 1 - Included as part of your public CNAR report.

Reminder that Part 1 will be made public on the CAS [website](#).

Contact Name:	<i>Connie Norton</i>
Contact Email:	<i>connie_norton@sfu.ca</i>
Organization Name:	<i>Simon Fraser University</i>
Role – Please select the best category for your current role with your organization. If more than one individual completed the survey, multiple categories may be selected:	Energy Manager Sustainability Coordinator Facilities/Operations Manager/Coordinator
Please select your sector:	Post Secondary (PS)

Stationary Sources (e.g. Buildings, Power Generators): Fuel Combustion, Electricity use, Fugitive Emissions.

Actions taken by your organization in 2019 to support emissions reductions from buildings

Do you have a strategy to reduce emissions from stationary sources?	Yes
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Whether you have a strategy or not, briefly describe your organization’s plans to continue reducing emissions from stationary sources:

Over the medium-term term (1-5 years)	<i>SFU developed a five-year Strategic Energy Management Plan in 2016 with targets to reduce energy consumption by 2% per year and to shift 70% of the fossil fuel-based energy to renewables by 2020. This was based on implementing energy efficiency and conservation projects, optimizing operational efficiencies, and investing in a renewable energy system. SFU also has a Strategic Sustainability Plan (2020-2025) which includes a target to reduce operational GHG emissions (aligned to the Carbon Neutral Government scope) by 50% by 2025.</i>
Over the long term (6-10 years)	<i>The long term strategy involves continuous optimization of energy consumption and fuel switching via low carbon electrification and renewable biomass.</i>

Please describe your strategy's goals (if any) related to energy audits.

The KPIs of each building are reviewed annually. Energy audits are conducted by third party consultants in approximately five major buildings per year. They assess a building's current situation, potential to improve operational performance by implementing recommended energy conservation measures, and/or building recommissioning programs.

What % on average of your building portfolio has an energy audit completed each year (if any)?

10

Please describe your strategy's goals (if any) related to building retrofits.

Building retrofits are considered based on an evaluation matrix that takes into consideration the age and condition of the equipment, energy conservation opportunities, and occupants' comfort.

What % on average of your building portfolio is retrofitted each year in the following categories (if any) - click here for further information:

See below.

Minor retrofits (e.g. low cost, easy to implement measures including caulking, lighting, adding roof insulation, etc.)

15%. Lighting upgrade projects that target all lighting on campus to be 100% LED in 2025.

Major retrofits (e.g. replacing windows and doors, equipment replacement such as boilers, etc.)

<5%. The majority of the boilers have been converted to condensing boilers. The process is underway to convert the central heating system from natural gas to sustainable biomass. The windows and doors in AQ 4000 have been upgraded to meet the latest building code, improving the thermal comfort of the interior spaces and air tightness of the building envelope.

Deep retrofits (e.g. replacing roof, replacing the heating, ventilation and air-conditioning system with a renewable technology like a ground-source heat pump, etc.)

<1%. The roof at Maggie Benston Centre is being upgraded. The Facilities Services Building gas fired system is being converted to electric, to improve space heating for a variety of staff while also lowering the facility's carbon footprint.

Please describe your strategy's re/retro-commissioning goals (if any)?

19 buildings were re/retro-commissioned during 2012-2018 under the Continuous Optimization Program. These buildings are being recommissioned every five years to ensure that their direct digital control (DDC) systems are operating at peak efficiency with constant variables in weather conditions, occupant capacity, and space usage.

What % on average of your building portfolio do you recommission each year?

10%

Do you keep records of Refrigerant gases¹ category and refilling volumes?

[1] Fugitive emissions from stationary cooling equipment are attributed to the leakage and loss of HFC and PFC based coolants from air conditioning and commercial type refrigeration systems. Coolant loss can occur during the manufacturing, operation, and disposal of such equipment. Gases that may be reported via CGRT include HFC R-134, HFC R-134a, HFC R-404a, HFC R-407c, HFC R-410a.

Yes

If yes, have you quantified and reported the associated emissions? What, if any, mitigation approaches have been considered? Please describe

No.

What, if any, mitigation approaches have been considered? Please describe.

SFU has a preventative maintenance program that monitors the status and condition of all chillers. Gas sensors have been implemented at every chiller for early detection of potential refrigerant leaks.

How many newly constructed buildings received at least LEED Gold certification in 2019?

0

How many newly constructed buildings did not receive LEED Gold certification?

1

Please explain why LEED Gold certification was not obtained for those new buildings.

The Surrey Sustainable Energy and Engineering Building targeted LEED Gold standard and certification is pending.

Mobile Sources (Fleet Vehicles, Off-road/portable Equipment): Fuel Combustion:

Actions taken by your organization in 2019 to support emissions reductions from mobile sources?

Do you have a strategy to reduce emissions from mobile sources?

Yes

Whether you have a strategy or not, briefly describe your organization's plans to continue reducing emissions from mobile sources:

Over the medium-term term (1-5 years)

SFU's Strategic Sustainability Plan will include strategies such as transitioning 40% of SFU's fleet to electric vehicles (EVs) by 2025. There is also a plan to increase the EV charging infrastructure on campuses, aligned to the target of reducing GHG emissions from commuting. SFU is also transitioning to a lease model to replace its fleet vehicles and open up more opportunity for EVs.

Over the long term (6-10 years)

As above, continue transitioning to an electrified fleet.

How many fleet vehicles did you purchase from the following categories:

Electric Vehicle – EV - (e.g., Nissan Leaf, Chevy Bolt)

1

“Plug In” Electric Vehicle – PHEV (e.g., plug-in Prius, Chevy Volt)

0

Hybrid vehicle – HEV – non “Plug In”- (e.g., Toyota Highlander Hybrid)

0

Hydrogen fuel cell vehicle

0

Natural gas/propane

0

Gas/diesel vehicle

3

If you purchased new gas/diesel vehicles, can you briefly explain why vehicles from the other categories were not chosen?

The new vehicles were car for car replacements; there weren't comparable EV alternatives available.

Actions taken by your organization in 2019 to support emissions reductions from mobile sources? (Continued)

How many existing EV charging stations does your organization have in each category:

Level 2?

10

Level 3?

0

How many level 2 stations (if any) are specifically for your fleet vehicles?

As defined as Level 2 stations only your organization's fleet vehicles may use

0

How many level 3 stations (if any) are specifically for your fleet vehicles?

As defined as Level 3 stations only your organization's fleet vehicles may use

0

How many EV charging station(s) did you install in 2019 in each category:

Level 2?

4

Level 3?

0

How many level 2 stations (if any) were installed specifically for your fleet vehicles?

As defined in the previous section

0

How many level 3 stations (if any) were installed specifically for your fleet vehicles?

As defined in the previous section

0

Please briefly describe any other related actions, (e.g. charging station feasibility studies, electrical panel upgrades, etc.)

42 "level 1" EV Chargers were installed on the Burnaby campus. These use "smart outlets" that communicate charging and energy usage data. With students/staff parking for 8 hours, Level 1 was more economical and allowed more chargers to be installed than going to Level 2.

Please indicate the total number of the vehicles in the following vehicle classes that are in your current fleet

Definitions:

- Light duty vehicles (LDVs) are designated primarily for transport of passengers <13 and GVWR<3900kg
- Light duty trucks (LDTs) are designated primarily for transport of light-weight cargo or that are equipped with special features such as four-wheel drive for off-road operation (include SUVs, vans, trucks with a GVWR<3,900kg)
- Heavy duty vehicles (HDV) includes vehicles with a GVWR>3,900 kg (e.g. ¾ tonne pick-up truck, transport trucks)

Light duty vehicles (LDVs)

Electric Vehicles – EV - (e.g., Nissan Leaf, Chevy Bolt)
2
“Plug In” Electric Vehicle – PHEV -- (e.g., plug-in Prius, Chevy Volt)
0
Hybrid vehicles – HEV – (e.g., non “Plug In”- older Toyota Prius, Toyota Camry hybrid)
0
Hydrogen fuel cell vehicles
0
Natural gas/propane
0
Gas/diesel
17

Light duty trucks (LDTs)

Electric Vehicles – EV
0
“Plug In” Electric Vehicle – PHEV
0
Hybrid vehicles – HEV – (e.g., non “Plug In”- older Ford Escape Hybrid, older Chevrolet Silverado pickup hybrid, etc)
0
Hydrogen fuel cell vehicles
0
Natural Gas/propane
1
Gas/diesel
73

Heavy duty vehicles (HDV)

Electric Vehicles – EV

0

“Plug In” Electric Vehicle – PHEV

0

Hybrid vehicles – HEV – (e.g., non “Plug In”)

0

Hydrogen fuel cell vehicles

0

Natural Gas/propane

0

Gas/diesel

0

Actions taken by your organization in 2019 to support emissions reductions from paper supplies.

Briefly describe your organization’s plans to continue reducing emissions from paper use:

Over the medium-term (1-5 years)

SFU plans to continue to promote the use of greener printing choices and will work with vendors to explore eco-friendly options.

Over the long term (6-10 years)

As above.

Do you have an awareness campaign focused on reducing office paper use?

Yes

Purchased alternate source paper (bamboo, hemp, wheat, etc.)

Yes