SFU SIMON FRASER UNIVERSITY

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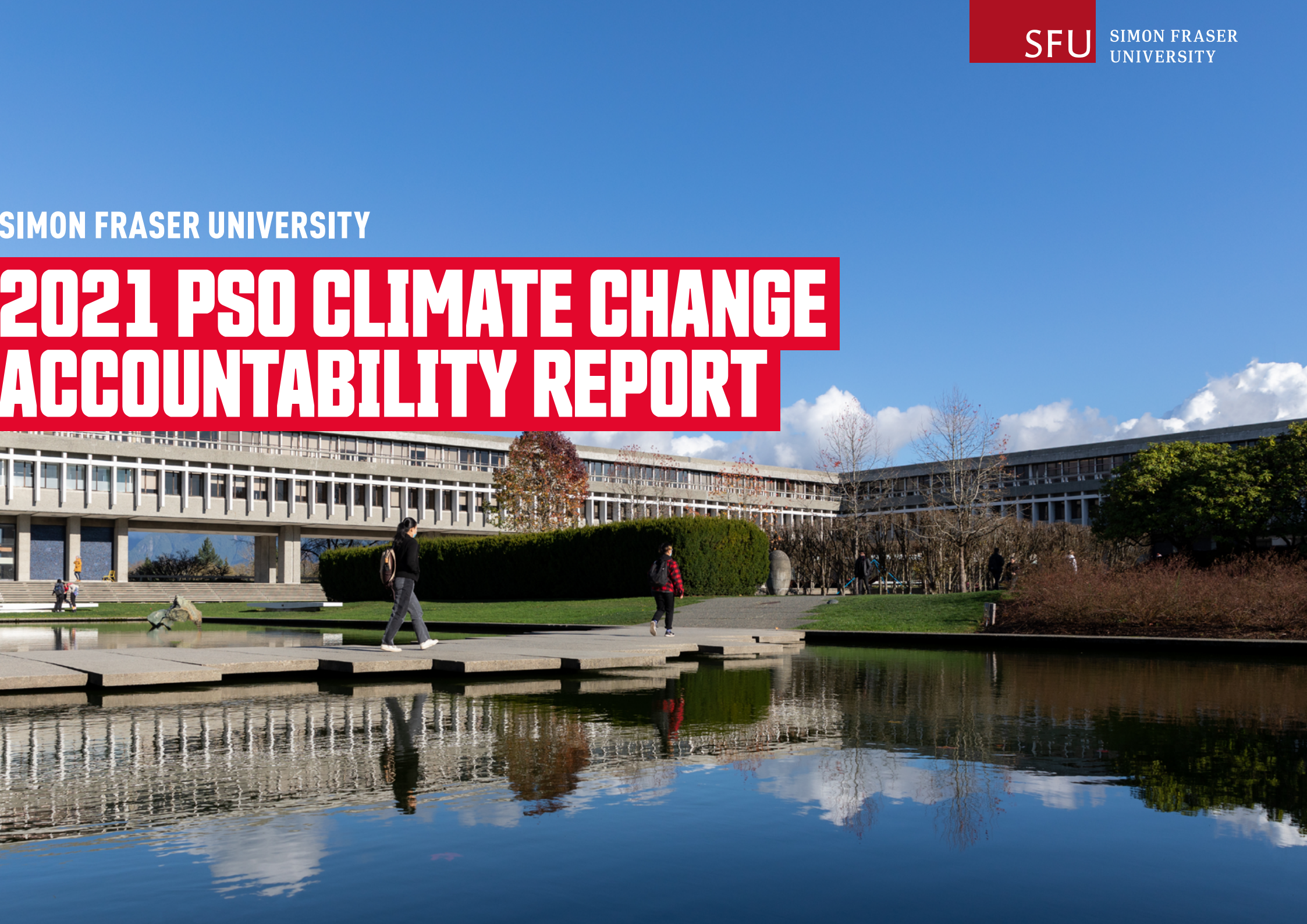
2021 PSO CLIMATE CHANGE ACCOUNTABILITY REPORT



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DECLARATION STATEMENT

This Climate Change Accountability Report for the period January 1, 2021 to December 31, 2021 summarizes our emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2021 to reduce our greenhouse gas (GHG) emissions and our plans to continue reducing emissions in 2022 and beyond. By June 30, 2022 Simon Fraser University's (SFU) final 2021 Climate Change Accountability Report will be posted to our website: sfu.ca/fs/projects-initiatives/sustainable-initiatives/ghg-emissions/carbon-neutral-action-reports.

OVERVIEW

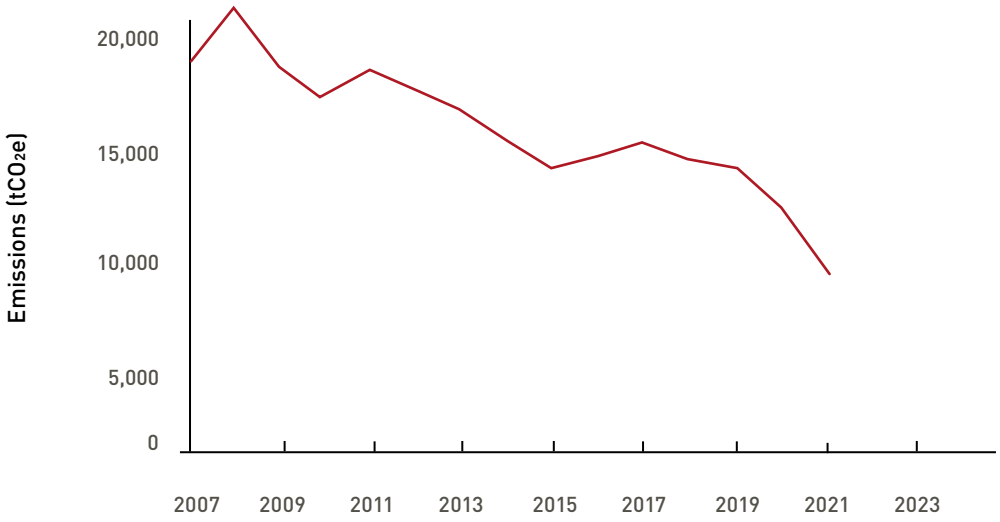
In 2021, SFU's total (GHG) emissions were 9,444 tonnes, 25 per cent lower as compared to 2020. Overall, SFU's emissions are 51 per cent below the 2007 baseline and surpass the provincial interim target of 16 per cent by 2025.

British Columbia has legislated targets and SFU has committed to the United Nations-backed Race To Zero campaign. SFU's targets for reducing GHG emissions below 2007 levels are as follows:

Year	B.C.'s Climate Action Legislation	SFU "Race To Zero"
2025	16%	50%
2030	40%	85%
2035	N/A	Net Zero (Scope 1 direct emissions)
2050	80%	Net Zero (direct emissions)

The emissions reductions realized in 2021 reflect, in part, the impact of the COVID-19 pandemic on campus operations. It is also a result of SFU's continued efforts to optimize energy consumption. Additionally, the transition to renewable sources of energy reductions were mainly due to energy use from the Corix Biomass Plant on Burnaby campus.

In 2022, SFU will continue to implement energy efficiency measures and embed more energy-saving practices to support the university's commitment to GHG emissions reduction and the UN-led Race To Zero campaign. The university is exploring opportunities to increase its use of electric vehicles (EV) in its fleet, moving forward with the low carbon electrification initiative to reduce SFU's reliance on fossil fuels for heating and efforts to upgrade equipment, lighting, and building control systems to maximize efficient energy consumption in buildings.



EMISSIONS AND OFFSET SUMMARY TABLE

SFU 2021 GHG emissions and offsets
GHG Emissions created in calendar year 2021

Total emissions (tCO_2e)	9,444
Total $BioCO_2$	20
Total offsets (tCO_2e)	9, 424
Adjustments to offset required GHG emissions reported in prior years	
Total offsets adjustment (tCO_2e)	-
Grand total offsets for the 2021 reporting year	
Grand total offsets (tCO_2e) to be retired for 2021 reporting year	9,424
Offset investment ($25 per tCO_2e)	$235,600

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 obligations reported above for the 2021 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 invoices to be issued by the Ministry in an amount equal to $25 per tonnes of offsets retired on its behalf plus GST.

EXECUTIVE SIGN-OFF

May 30, 2022

Signature | Date

Dugan O'Neil | Vice-President Research & International

Name | Title

May 30, 2022

Signature | Date

Martin Pochurko | Vice-President Finance & Administration

Name | Title

1.0 GHG EMISSIONS REDUCTIONS: BUILDINGS

Despite uncertainties from the COVID-19 pandemic, SFU continued to lead campus-wide efforts to reduce its energy consumption and GHG emissions from buildings. These efforts include strategic planning, adhering to high-performance building standards, investing in renewable energy and low-carbon electrification, and implementing innovative energy efficiency and conservation measures across the SFU community.

Planning for reductions

SFU is in the planning stages of updating the multi-year plans for the Strategic Energy Management Plan (SEMP) and the SFU Strategic Sustainability Plan (2020-2025) (SFU 2025). The SEMP will focus on reducing energy usage and GHG emissions while considering economic, sustainability and social responsibility. SFU 2025 includes three goals and 16 climate action targets for the entire institution. This plan is being renewed in 2022 with updated goals and targets. Progress on the renewal and progress up can be found on the SFU Sustainability web page.

Building management system

A consultant has begun the initial phases of the Continuous Optimization (C-Op) program at the Maggie Benston Centre, Strand Hall, and Saywell Hall. After collecting and analyzing one year of data, a final report will be provided by spring 2023 to summarize the building's operations including a list of recommended energy conservation measures to implement.

The Technology & Science Complex 1 and 2 is going through a strobic optimization process. Strobic air exhaust systems are practical, cost-effective and energy-efficient solutions for SFU's energy demands.

Artist rendering of SFU Parcel 21

Collaboration between the Faculty of Science and Environmental Health and Safety to upgrade the fume hoods in the chemistry building will ensure energy efficient operations of fans and motors, which also helps to prolong the equipment lifespan and reduce maintenance requirements. Variable fan speeds will maintain the necessary face velocity to protect lab users and their experimental contents within the fume hood by reducing the potential turbulence of air flow entering.

New buildings and major renewal of existing buildings: Parcel 21

The design and construction of the two newly constructed residential towers is influenced by Passive House requirements, the world's highest voluntary energy-based standard. The building's operations and maintenance will reflect similar energy efficiencies as demonstrated by Passive House standards. Handover for SFU Facilities Services to operate and maintain these buildings includes 90 accessible and accessible-ready units that are all serviced by heat recovery ventilators (HRV). Occupancy is scheduled for June 2022, this project was a successful applicant for the Net Zero Energy Ready Challenge in 2019, awarded by CleanBC Better Buildings.

The Applied Sciences Building is currently undergoing a major renovation. The building's façade is being upgraded to improve energy efficiency, reduce air leaks, and enhance occupant comfort. This includes upgrades to offices that replaced pneumatic heating with radiant heating panels in the ceiling supplied by hydronic 6-way valves for accurate temperature controls. The scope also includes the addition of an air handling unit on the penthouse where fresh outdoor air passes a MERV 8 and then a MERV 13 filter prior to entering the preconditioning heat exchanger to provide clean air. Future pandemic and/or power outage issues have been addressed by maximizing the number of operable windows to allow for natural ventilation in every room. The existing boiler remains but only acts as a backup, now that the entire building is serviced by SFU's district energy system, extracting heat from the Corix Biomass Plant.

Lighting

Lighting upgrades of all offices, laboratories, classrooms and common areas within Blusson Hall and Saywell Hall were completed, including the bollards in the shared courtyard. The new fixtures not only consume significantly less electricity, but they will also operate more reliably for longer.

SFU Applied Sciences building construction project

SFU's Animal Care Services updated several rooms and corridors according to the latest standards for Laboratory Animal Facilities. The newly installed fixtures are on a smart timer control with the capability to mimic natural sunlight levels throughout the day while consuming a lower amount of electricity than the previous fluorescents.

Facilities Services and SFU Residences collaborated to complete a lighting retrofit at the Doris and Jack Shadbolt tower and an energy study for the Barbara Rae and Pauline Jewett towers. Implementation will occur next year with support from BC Hydro to replace lighting fixtures with more efficient and reliable LEDs.

In preparation for future conservation projects, an energy study conducted on the Applied Sciences building concluded that a lighting upgrade in all offices, classrooms and common spaces that were not involved in the current renovation projects are necessary upgrades and are planned for 2022. The Facilities Services team in Vancouver and Burnaby will collaborate to conduct energy studies and implementation at the downtown campus over the next three years. A lighting redesign will be conducted at the West Mall Complex, Visitors, and Convocation Mall parkades to improve safety for drivers and pedestrians.

Boiler and chiller upgrades

Facilities Services is replacing the boiler with a variable refrigerant flow (VRF) system combined with a building envelope upgrade at the Diamond Alumni Centre. This replacement will allow for better control and maintenance of the interior space conditions to ensure occupant comfort while eliminating the use of fossil fuel heating from the building. In addition, an upgrade to the building envelope will reinforce the building's façade from outdoor elements, to avoid unnecessary operation of equipment to maintain interior conditions.

Building control systems upgrade

The Robert C. Brown building and the 7th floor of the WAC Bennett Library underwent a complete controls upgrade, replacing the pneumatic system with electronic valves that target specific zones. These valves are connected to SFU's building automation system. This provides Facilities Services with the ability to remotely monitor the situation in these areas and collect a more accurate understanding of the space conditions in each building and the ability to make necessary adjustments to ensure efficient operation while maintaining occupant comfort.

The Continuous Optimization Program, an initiative supported by BC Hydro and FortisBC, was completed at the West Mall Complex. This program improves the building's automation system to ensure the HVAC systems are operating efficiently. New sensors were also installed in classrooms to improve ventilation when occupied, and conserve energy when vacant.

SFU's Corix Biomass facility is fueled by burning urban wood waste

2.0 GHG EMISSIONS REDUCTIONS: RENEWABLE ENERGY AND LOW CARBON ELECTRIFICATION

Corix Biomass project

The Corix Biomass project began operating in October 2020. It is a newly constructed high-efficiency heating plant, fueled by burning urban wood waste from Metro Vancouver to generate hot water. This hot water is then transported via underground pipes to heat most of SFU's Burnaby campus.

The bulk of reductions (approximately 80 per cent) in reliance on natural gas at the Burnaby campus was achieved through the building of the Corix Biomass Plant in 2020. To tackle the remainder of natural gas emissions, Facilities Services is taking a multi-pronged approach including low carbon electrification projects and renewable natural gas (RNG) purchasing. RNG is a carbon neutral equivalent to traditional natural gas and is produced from organic waste from local partners that capture methane and carbon dioxide gases. Monthly and daily comparison of main campus consumption shows a significant impact on GHG reductions without compromising business operations or occupant comfort.

Low carbon electrification

Facilities Services is exploring and planning to launch electrification projects across all three campuses with the aim of reducing reliance on carbon intensive energy including natural gas. Energy projects are currently being explored in the Diamond Alumni Centre and the Southeast Classroom Block (including ventilation upgrades and heat pump installation).

SFU's print and digital services department scaled back operations in 2021

District Energy System Modernization
In fall 2021, Facilities Services initiated a campus-wide assessment of the district energy system to look at existing conditions and opportunities to modernize and upgrade. We will begin renovation work on the system towards the end of summer and the beginning of fall 2022. This will be a long-term project.

3.0 GHG EMISSIONS REDUCTIONS: FLEET

Fleet electrification is a priority for SFU. Facilities Services, Parking and Sustainable Mobility Services, Procurement Services and the Sustainable Transportation Working Group (aligned to SFU 2025) are among the groups working toward an electrified fleet. SFU is gradually transitioning towards more owned or leased electric vehicles (EVs) in its fleet. Facilities Services is transitioning to a lease model to replace its older fleet vehicles and create more opportunities for EV use, as they become available on the market.

Due to the distances travelled for field work, EVs are not currently a viable solution for the Academic fleet. Safety and Risk Services uses a total of eight vehicles as part of their patrol fleet, out of which one is an EV and two are hybrids.

In the past year, SFU has received nine new vehicles that were ordered in 2020. SFU has currently placed an order for twelve more vehicles, out of which seven are EVs. The remaining 14 new leased internal combustion engine vehicles replaced SFU's oldest fleet with more efficient models.

4.0 GHG EMISSIONS REDUCTIONS: PAPER

SFU's GHG emissions associated with paper consumption are less than 1 per cent of the total reported emissions. Document Solutions, SFU's print and digital services department, had scaled back operations in 2021 because of the pandemic. Increases in academic printing are starting to occur as more of the SFU community return to campus, however, general printing remains below pre-pandemic levels, as remote learning, collaboration software, and online delivery and sharing of materials is more readily accepted and feasible, especially where working remotely is practiced.

5.0 GHG EMISSIONS REDUCTIONS: BEHAVIOUR CHANGE INITIATIVES

Sustainable Spaces program
Sustainable Spaces, a program to engage staff in certifying their spaces and events according to sustainability criteria, has been running since 2017. To accommodate remote working conditions during the pandemic, SFU Sustainability launched an online Sustainable Spaces: Home Edition Checklist, to support the wider SFU community with sustainability and energy saving actions at home.

SFU's Living Lab Program

SFU's Living Lab program applies the university's leading sustainability and climate research to its own infrastructure and facilities, testing innovative solutions on-site that can be applied and scaled anywhere in the world. Through experiential and applied research with teams of staff, faculty and graduate students, Living Lab facilitates an innovative new model for sustainability-themed research at SFU.

In the program, SFU researchers can pilot and evaluate ideas and innovations on our own campuses—staff can make evidence-based decisions about new projects, and graduate students can contribute to timely applied research.

Living Lab uses external funding, available to graduate students and relevant SFU staff, to test research innovation ideas. The program is a joint initiative between SFU Sustainability, the Office of the Vice-President, Research and International, and the Office of the Vice-President, Finance and Administration.

The initiative launched in 2020 with the first cohort of Living Lab scholars. Their work in 2021 included the following emissions related projects:

- → Examining the carbon impact of streaming media in university teaching & learning
- → Sustainability and management of bioplastic food service products
- → Life-cycle analysis (LCA) for SFU fleet electrification
- → Sustainable living indoor gardens utilizing energy-efficient and renewable energy technology

In 2022, we will see the start of projects, including:

- → Sustainable energy production through utilizing hybrid solar-rain cells
- → SFU transportation and commuting survey
- → Optimized building retrofit strategy tool
- → The life and afterlife of digital devices in academic research

SFU Living Lab Scholar Laura Beattie conducts research to better understand commuting patterns

The projects will continue into 2022 and the program will expand into more areas of sustainability research.

6.0 ACTIONS TAKEN TO MANAGE RISK RELATED TO A CHANGING CLIMATE

In line with Provincial commitments for a carbon-neutral public sector, SFU has reported on its climate change mitigation efforts since 2008 through its annual Carbon Neutral Action Reports. In addition, SFU has many existing plans and actions in place that form a strong foundation for climate change adaptation, such as the Stormwater Management Strategy and Wildfire Management Strategy. However, there is still a need to develop an overarching low-carbon resilience plan that integrates mitigation and adaptation measures and captures co-benefits. As the first step in this process, a team of consultants and SFU staff members completed a comprehensive Climate Change Risk Assessment and identified key action areas to focus on.

This assessment process engaged students, staff, faculty, neighbouring municipal staff and other members of the campus community. The process itself is a step forward to manage risk related to changing climate, as it builds the capacity of those engaged to understand the future climate of the region. The next phase of work in 2022 will focus on:

Planning

- → See section 1.0 Planning for reductions (page 3)
- → Integrating the climate change risk assessment key actions ("big moves") into the SFU 2025 renewal to integrate climate mitigation and adaptation
- → Renewal of SFU 2025 to include higher Scope 1, 2 and 3 reduction targets that meet our commitment to the UN-backed Race To Zero campaign
- → Launch of an implementation plan for SFU 2025 that will include additional energy saving and GHG reducing projects and initiatives

Executive level engagement

- → Coordination with all VPs and their portfolios to embed sustainability and climate action/resilience into portfolio plans and strategies
- → Engagement with a new Climate and Sustainability Committee of SFU's Board of Governors

Community engagement and education

- → Continuous stakeholder engagement with Indigenous scholars and staff, highly impacted groups, and faculty, to gather additional information on expected impacts of the changing climate and how to mitigate them equitably
- → Launching a Climate Literacy Program open to all students, staff, and faculty to improve knowledge of climate change and impacts to SFU and to improve competency among the SFU community in mitigating and addressing these impacts
- → A new Climate Education and Literacy Working Group will be supporting faculty in the integrating of climate and sustainability into their courses
- → Launching a new website focused on climate and sustainability education, information and providing data to the SFU and broader communities for them to effectively access climate and sustainability information.

Research

- → Launch of round two Living Lab research projects focused on lowering GHG impacts
- → The launch of a new Community Centered Climate Innovation (C3I) initiative which will include but not be limited to:
  - → A partnership with the City of Burnaby (Civic Innovation Lab)
  - → A potential partnership with Oregon and the Asia-Pacific Network
  - → A new climate change research cluster and research agenda
  - → Clean technology circle

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