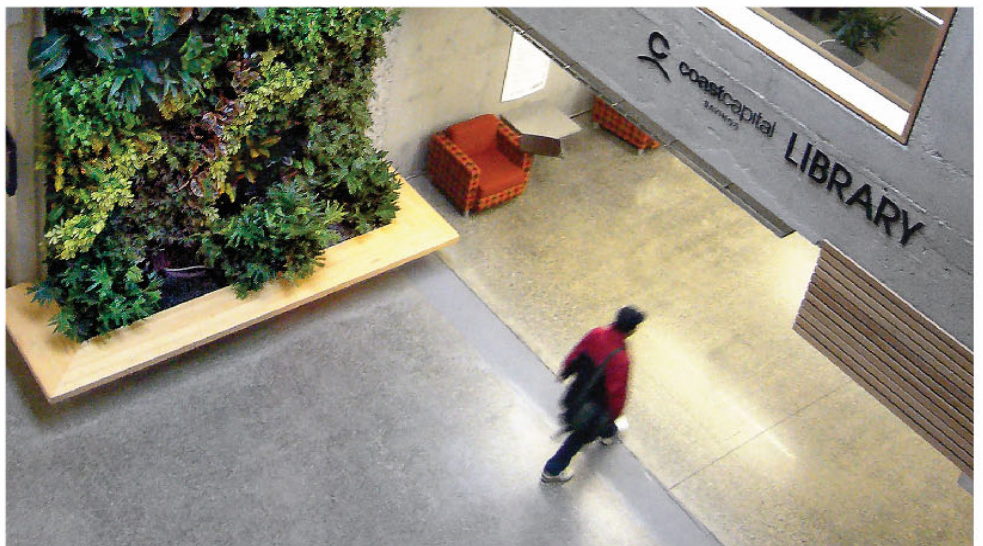




2021 PSO Climate Change Accountability Report KWANTLEN POLYTECHNIC UNIVERSITY

Prepared by Facilities Services



May 2021

2021 PSO Climate Change Accountability Report

Organization Name:

Kwantlen Polytechnic University.

Declaration statement:

This “PSO Climate Change Accountability Report” for the period January 1, 2021, to December 31, 2021, summarizes our greenhouse gas (GHG) emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2021 to reduce our GHG emissions, and our plans to continue efforts toward reducing emissions in 2022 and beyond.

By June 30, 2022, Kwantlen’s final “PSO Climate Change Accountability Report” will be posted to our website at the following link: <https://www.kpu.ca/sustainability>

Actions taken in 2021 to minimize emissions:

The following actions were taken at KPU Campuses in 2021 to minimize GHG emissions:

All Main Campuses – Fuel Switching Studies: These studies were implemented to identify opportunities for fuel switching from Natural Gas to Electricity to reduce GHG emissions that can be completed within the existing reserve electrical capacity of the main electrical systems at each main campus. The study results are being used to plan work to further reduce GHG emissions.

All Main Campuses – Electrical Reserve Capacity Studies: These studies were implemented to evaluate the reserve electrical capacity left on the main electrical systems to fuel switch heating systems from natural gas to electricity. The study results are being used to plan future projects to fuel switch heating systems from natural gas to electricity to reduce GHG emissions.

All Main Campuses – EV Charger Studies: With the intent to help inform the reduction of Scope 3 emissions related to commuting, these studies were implemented to provide evaluations and recommendations for feasibility, available grants, future considerations, and costs associated with the installation of electric vehicle chargers.

Surrey – Geo-Exchange Pre-Feasibility Study: A Geo-Exchange pre-feasibility study was implemented to evaluate the feasibility of expanding the geo-exchange system at Surrey campus and to identify and evaluate other options to fuel switch heating systems from natural gas to electricity to reduce GHG emissions.

Langley – Convert Greenhouse Lights to LED: A change was made in some greenhouse areas to convert the lighting system technology from high-pressure sodium to LED to reduce electrical consumption and associated GHG emissions while at the same time improving the quality of light in these areas.

Langley – Optimize Building Control Systems: Added CO₂ and occupancy sensors for demand ventilation control in selected areas of these buildings to reduce energy consumption and associated GHG emissions.

Surrey – Main Transformer Equipment: The main transformer equipment at Surrey campus is being increased in capacity to support increased electrification of the main heating systems as well as the addition of future electric car charging stations. An RFP to hire consultants was issued in 2021 and the design work was started.

Surrey Cedar – Rooftop Units Replacement: An RFP to replace these rooftop units with roof-mounted air source heat pumps was issued and the design work to replace the units started in 2021.

Surrey Cedar/Fir – Optimize Building Control Systems: Added CO₂ and occupancy sensors for demand ventilation control in selected areas of these buildings to reduce energy consumption and associated GHG emissions.

Office Paper Consumption: The following steps were taken in 2021 to support emission reductions from paper supplies.

- **Reducing Paper Usage** – all printers are defaulted to 2-sided and black print to reduce paper and toner usage. Online tools and work order system to are used to reduce printing of work orders.
- **Recycled Content in Paper** – increased use of paper that is FSC Certified or a non forest product.
- **Alternative Sources of Paper** – moved copy paper for printers to a “Sugar Sheet.” This product is made from the left over sugar canes.

Plans to continue reducing emissions in 2022 and beyond:

Of the 2435 tCO₂e KPU produced in 2021, 2385 tCO₂e or approximately 98% were produced by burning natural gas. Improving efficiencies in heating systems and exploring alternative energy heating sources is key to achieving substantial GHG emissions reductions to meet statutory and internal emissions reduction targets.

All Campuses – Asset Condition Assessments & Lifecycle Planning: the condition of all fossil fuel-burning equipment such as boilers, HVAC units, etc. will be formally evaluated by a third party organization with this expertise, to determine end of service dates. This information will be used by KPU to develop a long-term asset replacement plan that is coupled with carbon neutral goals through the use of electrified replacement equipment. This approach balances the need to replace assets while at the same time continuously reducing GHG emissions towards the 2050 carbon neutral goal.

All Campuses – Renewable Natural Gas (RNG) – preliminary research and meetings with Fortis have occurred or are planned to explore the viability of using Renewable Natural Gas (RNG) as a possible short or long term pathway to reducing GHG emissions.

All Campuses – Low Carbon Electrification (LCE) Feasibility Study – an RFP is being developed in consultation with BCHydro to conduct a Low Carbon Electrification (LCE) Feasibility Study. This study

will help determine if it is feasible to electrify heating systems that would normally be powered by fossil fuels as well as evaluate other possible options to reduce GHG emissions. This study is necessary in order to be eligible for funding from BC Hydro to electrify heating systems.

All Campuses – Decarbonization/Low-Carbon Electrification Planning Study – A study was conducted to compare technological options already explored, as well as those undertaken by other post-secondary institutions. The study provided recommendations for additional investigations into retrofit options that focused on the systems that distribute heating and cooling, not the individual heating and cooling plants, as another potential strategy to reduce GHG emissions. The work also included a visioning component to help clarify KPU's priorities and principles related to decarbonizing its campuses.

All Campuses – Exterior Lighting Upgrade: Exterior lighting systems will be evaluated and upgraded to improve lighting for safety and security while at the same time reduce energy consumption and associated GHG emissions using more efficient lighting technology. An RFP to select a design consultant has been issued, proposals have been received, and the selection process is in progress.

Cloverdale – Electric Vehicle Charging Infrastructure: Evaluating if the existing 110 volt electric vehicle charging plugs can be upgraded to level 1 or level 2 chargers.

Surrey – Main Transformer Equipment: The main transformer equipment at Surrey campus is being increased in capacity to support increased electrification of the main heating systems as well as the addition of future electric car charging stations. Design work started in 2021 and is in progress in 2022.

Surrey Cedar – Rooftop Units Replacement: This project started in 2021 and is currently in design phase. It is anticipated that this project will be tendered and implemented the summer of 2023.

Richmond Campus – Domestic Hot Water Tank: The natural gas fired domestic hot water boiler used for summer domestic hot water when the main boiler plant is not in service during summer months will be replaced with an electric hot water boiler.

Office Paper Consumption: KPU plans on continuing to purchase recycled content paper, use online tools and electronic devices to offset work orders to continue reducing emissions from office paper in future years

TDM Strategy: KPU has completed technical assessments of the potential extent of its Scope 3 emissions related to commuting as well as identified a number of transportation options that may serve as alternatives to commuting using private vehicles. These technical efforts will form the basis for the development of a comprehensive TDM Strategy for KPU and its campuses.

[Additional Information](#)

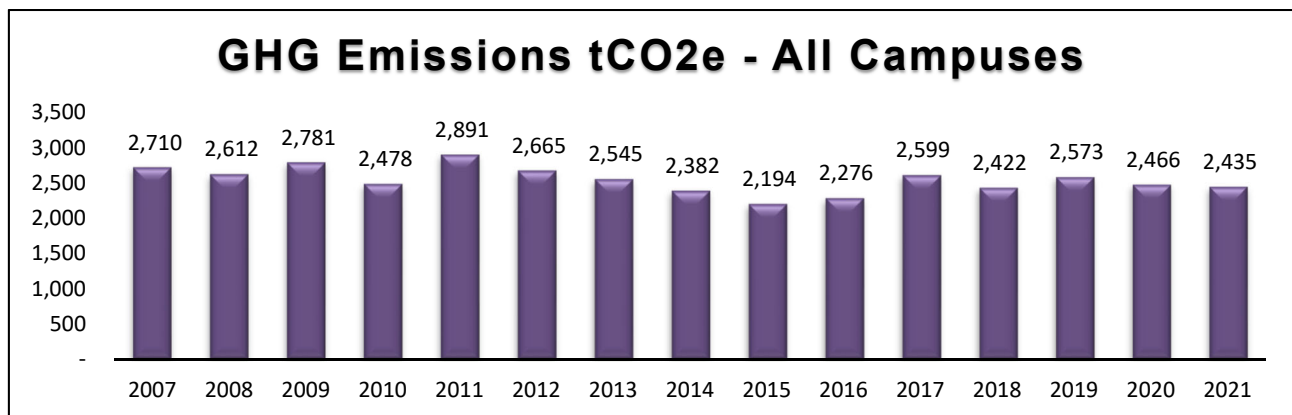
[Overview](#)

In 2000, KPU implemented a major energy conservation project that significantly reduced energy consumption and carbon emissions, and between 2000 and 2007, KPU completed several other energy conservation projects. By 2007 these projects had reduced energy consumption by 11% for electricity and 6% for natural gas even though campus sizes had increased in area by 10%.

When Bill 44 legislation to reduce greenhouse gas emissions was passed in 2007, the targets were set as percentage reductions of total emissions based on reducing GHG emission levels from 2007. In 2007 KPU's emissions had already had significant reductions due to the energy conservation projects, and in 2007 KPU generated 2,710 tCO_{2e} of emissions.

Other factors that affect KPU's emissions include space utilization which has increased since 2007 due to increases in student enrollment and longer hours of operation at some campus locations and growth as the university added new campuses and buildings. From the 2007 baseline year to 2021, KPU increased the overall building area by 18%. During this same period KPU was able to decrease carbon emissions intensity per square meter by 26%. The increase in building area has impacted and reduced the GHG reductions achieved from our base year of 2007 to 10.15%.

The chart below illustrates KPU's total emissions from the 2007 base year to 2021



Reference: KPU Energy Accounting Records – 2022

Emissions by Source

The total GHG emissions are from three sources: stationary energy, which is electricity and natural gas, mobile energy, which is for gasoline, diesel fuel and propane and office paper use. The primary source of the emissions is from heating the buildings using natural gas.

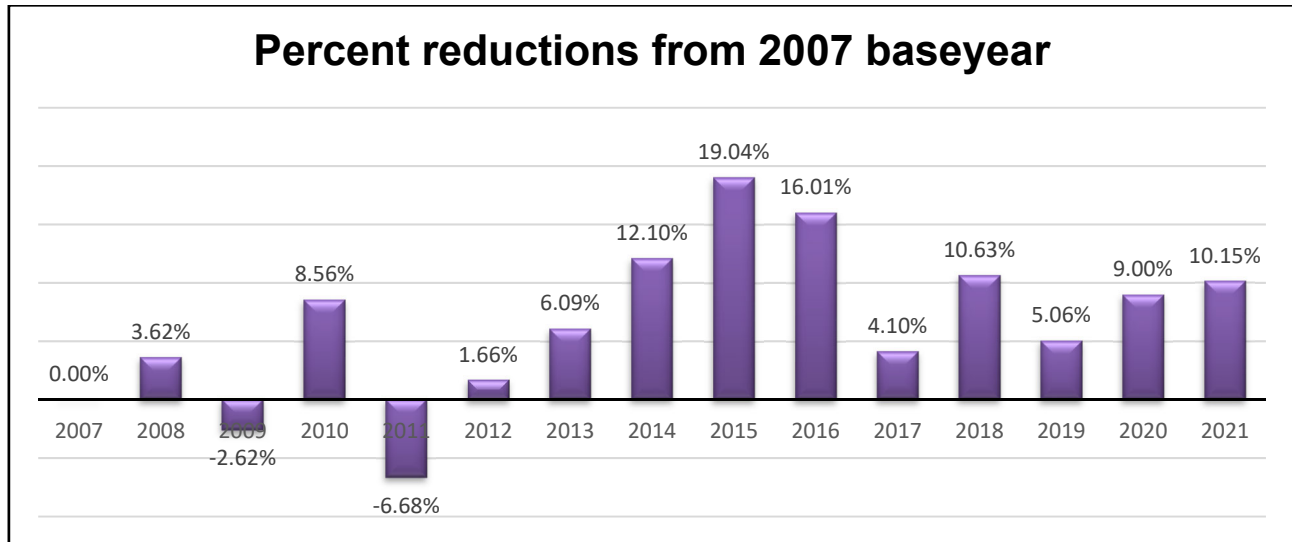
GHG Emissions Targets

The most recent legislated target KPU faces is the 40% reduction of GHG emissions from the 2007 benchmarking level by the end of 2030. KPU also has its own internal target to reduce GHG emissions by 50% from the 2007 benchmarking level by the end of 2025, given our commitment to be carbon neutral no later than 2050 as per the Global Universities and Colleges Climate Letter that KPU signed in 2019.

Progress Reducing GHG Emissions

Progress towards achieving carbon emissions targets has varied from year to year, but GHG emissions are steadily declining. KPU produced 10.15% less emissions in tCO_{2e} in 2021 than in 2007.

The chart below illustrates KPU's reductions from the 2007 base year to 2020



Reference: KPU Energy Accounting Records – 2021

Opportunities to Reduce GHG Emissions

Opportunities supporting efforts to reduce greenhouse gas emissions include the capital renewal and deferred maintenance funding from the province that has helped to initiate infrastructure renewal and replacement projects that also reduce energy consumption and associated greenhouse gas emissions. KPU is prioritizing these types of projects while funding is available and is focusing staffing and resources to support these projects to successful completion. This funding is essential to make the changes and improvements needed to meet the legislated and our internal GHG reduction targets.

Of the 2,435 tCO_{2e} KPU produced in 2021, 2385 tCO_{2e} were produced by burning natural gas, and fuel switching from natural gas to electricity is key to achieving substantial GHG emissions reductions to meet statutory targets.

Overall Initiatives which tie in with GHG Emissions Reductions

At KPU, energy conservation and reducing carbon emissions are core considerations when completing new expansions, renovating buildings, upgrading ageing infrastructure, and optimizing daily operations. KPU recognizes that organizations need to greatly reduce their impact on the natural environment. From a global perspective, KPU has signed the **Global Universities and Colleges Climate Letter** in 2019, committing to achieve carbon neutrality no later than 2050. **Vision 2023** defines KPU as a “learning ecosystem rooted in a culture of sustainability, creativity, and quality that inspires our people and our communities.” As outlined in Vision 2023, Sustainability will be achieved through a series of actions in which we will:

- Embrace all cultures and promote a renewed, authentic approach to Indigenization.
- Foster environmental sustainability through our offerings, research, and operations.
- Integrate planning to ensure KPU operations are aligned with our resources, thus sustaining quality and institutional health.

To that end, along with the numerous curricular offerings, KPU strives for efficient and sustainable outcomes in all its service delivery; examples include: green procurement practices and product selections such as enhanced recycled paper content; a comprehensive waste management program; technological solutions for meeting rooms and office PC's (the addition of cameras) to reduce the need for travel between campuses; promoting alternative transportation such as an intercampus shuttle, bike lockers, bike repair stations, and showers.

KPU strives to reduce water, electricity, and natural gas consumption so that KPU is a leader to others in our sector and the community. Continued partnerships contribute to KPU's energy conservation success. These efforts have been achieved through the support of our many partners, including design professionals, service technicians, building operators, BC Hydro, NRCan, the Province of British Columbia and more. Much of the energy efficiency work we have performed has been funded by either future avoided energy costs or from financial assistance from NRCan, BC Hydro, and our most valued partner, the Province of British Columbia.

KPU has developed the **KPU2050 Official Campus Plan**, which outlines the actions needed in formalizing a holistically sustainable KPU. In the interest of reducing campus GHG emissions, the Plan outlines directions to pursue phased electrification of existing building systems and establishes a zero-emissions commitment for new buildings. The Plan builds upon an existing foundation of employee and student-led sustainability commitments and initiatives that already positively shape KPU's campus culture, identity, and impacts.

2021 GHG Emissions and Offsets Summary Table

[Kwantlen Polytechnic University] 2021 GHG Emissions and Offsets Summary	
GHG Emissions created in Calendar Year 2021	
Total Emissions (tCO ₂ e)	2435
Total BioCO ₂	1.52
Total Offsets (tCO ₂ e)	2433
Adjustments to Offset Required GHG Emissions Reported in Prior Years	
Total Offsets Adjustment (tCO ₂ e)	0
Grand Total Offsets for the 2021 Reporting Year	
Grand Total Offsets (tCO ₂ e) to be Retired for 2021 Reporting Year	2433

Offset Investment (\$25 per tCO ₂ e) [Grand Total Offsets to be Retired x \$25/tCO ₂ e]	\$60,825
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Retirement of Offsets:

In accordance with the requirements of the *Climate Change Accountability Act* and Carbon Neutral Government Regulation, *Kwantlen Polytechnic University* (**the Organization**) is responsible for arranging for the retirement of the offset's obligation 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 invoice to be issued by the Ministry in an amount equal to \$25 per tonne of offsets retired on its behalf plus GST.

Executive sign-off:

Signature 	Date May 26, 2022
Name (please print) Reza Khakbaznejad	Title Interim VP, Administration