UNBC UNIVERSITY OF NORTHERN BRITISH COLUMBIA

2025 PSO Climate Change Accountability Report

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2025

Climate Change Accountability Report

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Declaration Statement

This PSO Climate Change Accountability Report for the period January 1, 2025 to December 31, 2025 summarizes our greenhouse gas (GHG) emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2025 to minimize our GHG emissions, and our plans to continue reducing emissions in 2026 and beyond.

By June 30, 2026, the University of Northern British Columbia's final 2025 Climate Change Accountability Report will be posted to our website at www.unbc.ca

Emission Reductions: Actions & Plans

Stationary Sources

Actions Taken to Minimize Emissions

Stationary energy use in buildings is the most significant contributor of emissions at UNBC. In 2025, stationary sources contributed 94% of total emissions. As in previous years, UNBC continued to implement measures in 2025 to reduce emissions from stationary sources. One of the most impactful actions undertaken in 2025 was the major LED lighting upgrade completed in the Teaching and Learning Centre (Figure 1). Approximately 1000 fluorescent lighting fixtures were replaced with new LED fixtures in all areas of the building, including corridors, classrooms, and offices.

The total annual electricity consumption savings are expected to be 170,000 kWh per year. Controls for the lighting were also upgraded, including using motion sensors to automatically control the lights depending on occupancy. Where applicable, networked lighting fixtures with integrated sensors were also used to enable programmable lighting zone control. With the removal of the fluorescent lighting, this project will also lead to lower maintenance costs and reduced waste. Additionally, the new fixtures help improve the building's interior aesthetics and provide better lighting comfort for occupants throughout the building.

Figure 1:

New Classroom Fixtures

Figure 2:

Fluid Cooler

In 2025, the district cooling system also received significant upgrades that will improve efficiency and resiliency. Construction of a new fluid cooler system was completed (Figure 2). An adiabatic fluid cooler was installed outside the Power Plant and connected with underground piping to a new heat exchanger which was tied into the existing district chilled water system. Heat will be transferred from the returning chilled water to glycol that will then be pumped to the fluid cooler where the heat will be rejected. The fluid cooler will be used during milder ambient temperatures to provide cooling when typically the more energy intensive centrifugal chillers would have been used in the past. This will help offset the significant power demand and consumption of the chillers during the cooling season. Additionally, the fluid cooler can be used overnight to lower the temperature of the chilled water loop for use the next day. The fluid cooler will also help to prolong the life of the chillers by offsetting their usage during the cooling season.

The efficiency of the district cooling system was further improved with the installation of variable speed drives on the primary distribution and secondary chiller pumps. Two 20 HP and two 50 HP motors that used to run at constant speed will now run at variable speed, controlled based on the cooling load demand. This project will result in significant electrical savings, estimated at over 100,000 kWh per year.

As in previous years, a crucial contributor of emissions reduction has been the improved availability of the Bioenergy Plant. Since it began operating in 2011,the Bioenergy Plant at UNBC (Figure 3) has been the most important factor in reducing emissions, supplying up to 85% of the peak heating demand of the Prince George campus, which otherwise would be supplied by combustion of natural gas.

Through both the Bioenergy Plant and the smaller pellet boiler that supplies heat to a number of small buildings through the winter, UNBC has been able to reduce its annual emissions by 57% in 2025 compared to the 2007 baseline level. The Bioenergy Plant's availability in 2025 increased compared to 2024, and this contributed to an improvement in emissions reduction. We will continue to focus on improving the Bioenergy Plant's performance and reliability, thereby further reducing natural gas emissions.

Figure 3:
Bioenergy Plant

Plans to Continue Reducing Emissions

UNBC has proven it is able to meet and even exceed the province's 2030 GHG emissions reduction target of 40% from the 2007 baseline. However, to meet UNBC's own target of 85% reduction by 2035 and thereby also the province's target of 80% reduction by 2050, further action is required.

In 2026, we are undertaking a number of projects focused on energy and emissions reduction. The Bioenergy Plant will receive various capital upgrades, including a new soot blower system that will improve thermal efficiency and reduce maintenance downtime. New maintenance access infrastructure will be installed, as well as ducting insulation that will reduce energy waste.

We are also planning to improve the efficiency of the district heating system by upgrading the connection between the Bioenergy Plant and Power Plant. In addition, as part of the ongoing initiative to upgrade our heat exchanger systems, multiple system upgrades are being planned, including for the Research Laboratory building. These upgrades will provide several energy efficiency improvements, thereby reducing energy usage and emissions.

UNBC continues to investigate various low carbon electrification opportunities to further displace the use of fossil fuels. This includes investigating electrification of the district heating system, as well as a major low carbon heating conversion for the Northern Sport Centre (NSC), potentially using geoexchange systems. This may also include the potential conversion of domestic hot water heating from natural gas boilers to electrically powered heat pumps at the NSC. The NSC is not connected to the bioenergy district heating system and currently relies only on natural gas for its heating needs, thus providing a potential opportunity for low carbon electrification.

In 2026, the third round of Continuous Optimization will also commence, wherein building systems are reviewed and resulting low-cost energy conservation measures are implemented. Additional energy savings projects being planned for future years include major lighting upgrades for the Medical building and the Northern Sport Centre. These will update all remaining areas that still have original fluorescent lighting, replacing them with new LED fixtures and improved occupancy-based controls.

Continued planning and implementation of maintenance activities for the Bioenergy Plant will help to ensure its reliable operation, thereby limiting the use of natural gas for heating. Efforts in the last few years have been successful in significantly improving the operation of the plant after major maintenance issues, and this is intended to continue in the coming years.

Mobile Sources

Actions Taken to Minimize Emissions

In support of the adoption of zero emission fleet vehicles, UNBC has added important battery electric vehicles to its fleet in recent years. This includes a Ford Lightning truck (Figure 4) that was procured to replace the aging heavy-duty truck used by the Facilities Department. In addition, a Subaru Solterra was procured for Parking and Security Services, who had been looking for a permanent replacement for their previous vehicle that had reached its end of life. These vehicles were identified as suitable replacements and have proven to be very successful in their applications thus far. More than 60% of the on-road administrative fleet is now composed of battery electric vehicles.

Figure 4:

UNBC Facilities Electric Vehicle

A charging station hub was also added to the outside of the Power Plant for dedicated overnight charging for Facilities electric vehicles. It is composed of a few Level 1 charging outlets and one Level 2 charger for the Ford Lightning. There are also three public Level 2 charging stations installed at UNBC, two of which were upgraded in 2025. The charging stations are freely accessible and users only have to pay for parking. These chargers support the use of electric vehicles in and outside the university.

Plans to Continue Reducing Emissions

As fleet vehicles are replaced, UNBC will continue to review alternative zero emissions options where feasible in order to further reduce fleet emissions. However, it should be noted that the majority of fleet vehicles are research vehicles that tend to travel to remote locations and typically need to be able to store and tow heavy equipment, as well handle rough terrain. The improvement of charging infrastructure in remote areas and increased availability of affordable zero emission vehicles that can meet these requirements will be important to enable this transition. The Facilities Department is also looking into electric versions of maintenance equipment, such as utility vehicles, where feasible, to replace existing equipment that reach their end of life.

Paper Consumption

Actions Taken to Minimize Emissions

In 2025, paper emissions accounted for only 0.1% of total emissions. At 3.21 tonnes of CO2e, this represented a 96% reduction from the high point of 79.8 tonnes in 2011. This is due to a decrease in the overall use of paper and an increase in the amount of recycled and alternative fibre content in paper that is purchased, which continued in 2025. All of the paper procured by UNBC in 2025 was from alternative fibre sources (waste fibre generated from sugar cane processing).

The continued transition from paper to digital workflows at UNBC, such as the introduction of a digital leave form system, has contributed to reducing paper emissions. In addition, the increased use of virtual instead of in-person meetings has also reduced the usage of paper materials for meetings. Tools such as PaperCut for printing also provide a mechanism for all individual users to monitor their paper usage and limit unnecessary printing.

Plans to Continue Reducing Emissions

UNBC will continue to prioritize the procurement of paper with recycled content and from alternative fibre sources, with the aim of reducing the overall emissions intensity of paper consumption. In addition to procurement practices, paper consumption will also continue to be reduced through the ongoing transition from paper-based to digital workflows.

Fugitive Sources

Actions Taken to Minimize Emissions

UNBC began reporting fugitive emissions in 2024. In 2025, fugitive emissions accounted for approximately 1% of total emissions. UNBC tracks fugitive emissions primarily through maintenance and service records. For applicable work orders, the refrigerant contractor records the equipment, refrigerant type, and relevant volumes. This information is then analyzed by UNBC to estimate leakage amounts and thereby determine the resulting fugitive emissions. Regular maintenance is conducted on equipment to ensure proper operation and minimize leakage. UNBC also adheres to regulatory refrigerant phase-out requirements.

Plans to Continue Reducing Emissions

UNBC will continue to incorporate best practices into equipment maintenance and replacement. As systems are upgraded or replaced, opportunities to utilize equipment with lower global warming potential (GWP) refrigerants will be considered, alongside continued improvements to maintenance and emissions tracking. Regulatory requirements for refrigerant phase-out will also be monitored and implemented accordingly.

2025 GHG Emissions and Offsets Summary Table

University of Northern British Columbia 2025 GHG Emissions and Offsets Summary

GHG Emissions for the Period January 1 - December 31, 2025	
Total BioCO2	8,140
Total Emissions (tCO2e)	10,412
Total Offsets (tCO2e)	2,272
Adjustments to Offset Required GHG Emissions Reported in Prior Years	
Total Offsets Adjustment (tCO2e)	0
Grand Total Offsets for the 2025 Reporting Year:	
Grand Total Offsets (tCO2e) to be Retired for 2025 Reporting Year	2,272
Offset Investment ($)	$56,800

Retirement of Offsets

In accordance with the requirements of the Climate Change Accountability Act and Carbon Neutral Government Regulation, University of Northern British Columbia (the Organization) is responsible for arranging for the retirement of the offsets obligation reported above for the 2025 calendar year, together with any adjustments reported for past calendar years (if applicable). The Organization hereby agrees that, in exchange for the Ministry of Energy and Climate Solutions (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.

Climate Risk Management

The Facilities department has continued to implement actions that were prioritized during a previous risk assessment process that included climate related risks, such as wildfires, disruptions to campus water supply, and potential situations that would require campus evacuation. Various actions were identified, including the replacement of critical underground domestic water valves, and the ongoing work on wildfire risk mitigation in the forested areas of the Prince George campus. UNBC has also partnered with the City of Prince George on flooding risks related to Shane Lake dam and the Shane Creek watershed.

Forest management to mitigate wildfire risks is an ongoing and constant priority for the university, which has only been further emphasized in the wake of more frequent and severe wildfires in recent years. To prepare for wildfire smoke, the Facilities department has reviewed outdoor air flushing programming and capabilities. Additional spare air filters are also secured each fire season due to more frequent replacements being required.

Severe heat waves are another climate risk identified for UNBC. Start-up prep and maintenance of the chilled water system has taken on additional importance. Localized individual AC units have also received similar attention to ensure they are functioning well. Additionally, mechanical cooling is included in the specification for all new buildings, largely as a provision for current and future climate change impacts. The rising peak summer temperatures will also inform the replacement or upgrade of the existing cooling towers. As has been observed in recent years, preparing for and reacting to increasingly severe climate events does incur additional costs, including in the form of increased utility costs (e.g. high electricity use for chillers during a heat wave) and increased maintenance costs (e.g. cost of additional spare filters due to wildfire smoke). It is expected that the implementation of the aforementioned fluid cooler system and variable speed drive upgrades will also improve the resiliency of the district cooling system.

Recent years have also shown the value of having back-up systems. For example, when the Bioenergy Plant had unplanned prolonged shutdowns due to maintenance issues in 2019 and 2020, existing natural gas boilers were used to maintain heating on campus. Similarly, in the event of power outages, diesel generators automatically start up to power emergency circuits. A new above ground diesel storage system has been installed to replace the old underground tanks. The diesel can be used for both electricity generation and in the main boilers in lieu of natural gas if the gas supply is interrupted.

The two most recently constructed UNBC buildings have both been Passive House certified, and all future new buildings are expected to meet the same standard. This strategy will be beneficial for the university's resilience to a changing climate. Passive House buildings are more resilient to both higher and lower temperature extremes. They require less energy to operate and are slower to lose or gain heat in the case of a power outage. The Facilities Management Building, a Passive House certified building completed in 2021, is intended to act as an emergency control centre for the campus since it is the most resilient building. As a longer term measure, UNBC will also investigate adopting the same Passive House strategies in potential retrofits of other existing buildings.

Other Sustainability Initiatives

There are a number of ongoing initiatives at UNBC that support sustainability, including the following:

- The renewed Sustainability Office has completed a number of key actions such as implementing a composting program, and establishing a Sustainability Advisory Council aimed at bolstering our initiatives in academic programming, research, and operations. The Council also helped to develop a 10-year Sustainability Strategic Plan (2025-2035).

- UNBC has been part of BC Hydro's Energy Management program since 2010. Through this program, BC Hydro helps to fund the Energy Manager position as well as a variety of energy conservation projects and campaigns. This includes the Energy Wise Network program, through which UNBC organizes an energy conservation campaign every year for students, staff, and faculty.

- The Facilities department continues to provide tours to interested visitors of the Bioenergy Plant and pellet boiler, as well as more recently the new Passive House certified buildings. In addition, the Energy Manager or Facilities Director will provide guest lectures or collaborate with the academic departments for research or coursework.

- UNBC established a recycling program in 1992, which today includes an in-house recycling centre to collect and compact its recyclables, allowing for comprehensive collection of materials. UNBC also offers recycling receptacles for batteries as well as a drop-off bin for recyclable electronics. Additionally, during demolition on renovation projects, the Facilities team preserves as much reusable material like furniture, insulation, and lighting as possible so that it can be reused where needed in the future.

- UNBC maintains a Green Fund that provides seed grants for innovative research, education, and civic engagement projects that promote sustainability at UNBC. The program was started in 2009 through a levy on parking fees. It has funded over $150,000 worth of projects.

- The Energy Conservation Revolving Loan Fund is maintained by the Energy Manager and provides funds to implement energy efficiency projects. Energy cost savings are used to repay the loan and fund future energy projects. The fund was created in 2012 when $250,000 was made available for energy project funding. To date, projects worth a total of $4.5 million have been funded.

- To promote cycling to campus, UNBC offers secure covered bike storage, six stand-alone high-security bike lockers, a bike repair station, shower facilities, and lockers for cyclists. In addition, all UNBC undergraduate and graduate students participate in the U-Pass transit program, which offers a discounted rate for unlimited access to public transit. For those commuting by car, UNBC also supports a carpooling program with a discounted parking permit.

- In partnership with the Feed BC program, UNBC Food Services supports local agriculture and food businesses through local food production, procurement, and active student engagement.

- In 2025, it is estimated that the new composter system prevented 9.4 tCO2e of emissions (if the food waste had otherwise been landfilled). This is significant given that landfilled waste emissions in total were 50.6 tCO2e in 2025.

Success Stories

A major lighting upgrade was completed in 2025 for the Teaching and Learning Centre that resulted in significant improvements in energy efficiency, thereby reducing emissions from purchased electricity. In addition, occupants of the building now have much improved lighting. This project will also reduce disruption and maintenance costs due to burnt out or flickering lights.

Another major milestone was the completion of construction for the new fluid cooler system that has been connected to the district cooling system. The fluid cooler will offset usage of the energy-intensive centrifugal chillers during suitable ambient conditions. This will help lower electricity consumption and also prolong the equipment lifetimes of the existing chillers.

The Continuous Optimization program continues to provide significant energy savings. In 2025, the second round of Continuous Optimization for the Medical building (Figure 5) was completed, resulting in 178,000 kWh in annual electricity savings. This amount of savings is similar to a major lighting retrofit, yet these savings were obtained from low-cost controls measures that were found during an investigation phase and then successfully implemented.

Figure 5:

Dr. Donald Rix Northern Health Sciences Centre

Executive Sign-off

Signature

May 29, 2026

Date

David Claus

Name (please print)

Director, Sustainable Facilities and Ancillary Services, and Interim Operations Lead

Title

If you have an idea of how UNBC can further reduce its GHG emissions or if you have a success story to share, please contact **energy@unbc.ca** or **sustainability@unbc.ca**