

# 2024 PSO Climate Change Accountability Report







# 2024

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## Declaration Statement

This PSO Climate Change Accountability Report for the period January 1, 2024 to December 31, 2024 summarizes our greenhouse gas (GHG) emissions profile, the total offsets to reach net-zero emissions, the actions we have taken in 2024 to minimize our GHG emissions, and our plans to continue reducing emissions in 2025 and beyond.

By June 30, 2025, the University of Northern British Columbia's final 2024 Climate Change Accountability Report will be posted to our website at [www.unbc.ca](http://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 2024, stationary sources contributed more than 98% of total emissions. As in previous years, UNBC continued to implement measures in 2024 to reduce emissions from stationary sources. One of the most impactful actions undertaken in 2024 was the continuation of the Continuous Optimization program. Undertaken in partnership with BC Hydro, the Continuous Optimization program involves investigating existing building systems to identify and implement opportunities for energy savings. The first round of the program took place between 2013 and 2017, tackling nine of the largest buildings at the Prince George campus. All nine buildings have now gone through a second round of the program. The most recent building assessed was the Dr. Donald Rix Northern Health Sciences Centre. A total of four existing measures were reconfirmed and two new significant measures implemented, including controls optimization and improved equipment scheduling. In total, from these low cost optimization measures, it is expected that the electricity savings for this building will be approximately 178,000 kWh per year with fuel savings over 500 GJ per year, ultimately leading to an emissions reduction of approximately 27 tonnes of CO<sub>2</sub>e per year.



**Figure 1:**  
**NSC Basketball Courts Fixtures**



**Figure 2:**  
**Server Room Cooling Coil**

In the pursuit of increasing energy efficiency and reducing emissions, various other actions were taken in 2024. Major lighting upgrades were completed for both the Northern Sport Centre (Figure 1) and the Teaching Laboratory building. The basketball court lights and squash court lights in the Northern Sport Centre were upgraded to LED fixtures. The fixtures for the basketball courts were also networked so that they could be programmed for different scenarios. These upgrades resulted in total electricity savings of approximately 149,000 kWh per year. Similarly, in the Teaching Laboratory, old fluorescent tube fixtures were upgraded to LED fixtures with occupancy sensors. This was done across all the labs and classrooms, for total electricity savings of approximately 117,000 kWh per year.

In addition, a cooling coil project was completed in the server room to offset the use of aging air conditioning units that had high power consumption (Figure 2). The coil is supplied with chilled water from the district cooling system and is used when the ambient outside air temperature is too high for free cooling. The existing two district cooling centrifugal chillers were also outfitted with new variable speed drives known as Adaptive Frequency Drives (AFDs) to provide better energy efficiency and help prolong equipment life. These measures resulted in total electricity savings of approximately 88,000 kWh per year.

Another continued focus in 2024 has been managing the availability of the Bioenergy Plant after major maintenance challenges in recent years. 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 approximately 55% in 2024 compared to the 2007 baseline level. Unfortunately, due to various operational and maintenance challenges, the Bioenergy Plant's availability in 2024 decreased compared to 2023, and this contributed to a change in the emissions reduction from 70% to 55%. Our efforts helped to minimize the impact and we will continue to focus on improving the Bioenergy Plant's uptime and thereby reducing natural gas emissions.



**Figure 3:**  
**Bioenergy Plant**

### **Plans to Continue Reducing Emissions**

UNBC has already proven it is able to meet and even exceed the province's 2040 GHG emissions reduction target of 60% 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 2025, we are planning to complete a major project to install an adiabatic fluid cooler for the district cooling system that will partially offset usage of the refrigerant based, energy intensive centrifugal chillers. Peak electricity consumption at UNBC occurs during the cooling season because of these chillers, and the new system will help to reduce electrical demand and thereby also reduce purchased electricity emissions.

Additional energy savings projects being planned in 2025 include a major LED lighting upgrade for the Teaching and Learning Centre that will update all areas that still have original fluorescent lighting. In addition, as part of upgrades to the district cooling system, variable speed drives will be installed on the main chilled water pumps, which will significantly reduce energy consumption.

In 2025, we are planning to improve efficiency in 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 the potential conversion of domestic water heating from natural gas boilers to electrically powered heat pumps at the Northern Sport Centre (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.

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

Mobile emissions in 2024 represented approximately 1% of total emissions. In support of the adoption of zero emission fleet vehicles, UNBC added two important battery electric vehicles in 2024 to its fleet. This included a Ford Lightning truck (Figure 4) 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 application thus far. More than 60% of the on-road administrative fleet is now composed of battery electric vehicles.

A charging station hub was also added in 2024 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. 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 community.

### Plans to Continue Reducing Emissions

In 2025, a new BC Hydro charging hub will be installed at the UNBC Northern Sport Centre. This will include four DC fast charging ports and four Level 2 charging ports in the initial phase, with the potential for future expansion. This will provide additional fast and reliable charging options on campus for the university community and visitors.

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 2024, paper emissions accounted for only 0.2% of total emissions. At 19.8 tonnes of CO<sub>2</sub>e, this represented a 75% 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 2024. All of the paper procured by UNBC in 2024 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.



Figure 4:

### UNBC Facilities Electric Vehicle



## 2024 GHG Emissions and Offsets Summary Table

### University of Northern British Columbia 2024 GHG Emissions and Offsets Summary

GHG Emissions for the Period January 1 - December 31, 2024	
Total BioCO <sub>2</sub>	6,695
Total Emissions (tCO <sub>2</sub> e)	9,103
Total Offsets (tCO <sub>2</sub> e)	2,408
Adjustments to Offset Required GHG Emissions Reported in Prior Years	
Total Offsets Adjustment (tCO <sub>2</sub> e)	0
Grand Total Offsets for the 2024 Reporting Year:	
Grand Total Offsets (tCO <sub>2</sub> e) to be Retired for 2024 Reporting Year	2,408
Offset Investment (\$)	\$60,200

## 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 2024 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 continues to work on projects that were prioritized during a 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). The upcoming completion of the aforementioned adiabatic fluid cooler project will also improve cooling system resiliency.

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 \$3 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.
- As an additional sustainability benefit of the Bioenergy Plant, bio-ash resulting from the process is collected and used for soil amendment at a local farm, thereby diverting the ash from simply being landfilled.

## Success Stories

The major lighting upgrades completed in 2024 in the Teaching Laboratory building and Northern Sport Centre, have resulted in significant improvements in energy efficiency, thereby reducing emissions from purchased electricity. In addition, occupants of these buildings now have much improved lighting. It also means that maintenance disruptions and costs are reduced, especially for the basketball courts where the fixtures are suspended at very high elevations and thus require special procedures and equipment to access.

2024 also marked a turning point for our pellet boiler system (Figure 5), which experienced a major mechanical failure earlier in the year. While the system was down for a large portion of 2024, this downtime provided an opportunity to reassess and redesign the system. After implementing a series of improvements, the boiler is now operating with better efficiency. The upgraded system produces more heat output, thus offsetting natural gas usage and its related emissions. This project is a good example of the actions being taken throughout the year to improve the efficiency and performance of systems on campus, which ultimately results in the reduction of GHG emissions.



**Figure 5:**  
**UNBC Pellet Plant**



Executive Sign-off



Signature

Rahim Somani

Name (please print)

June 2, 2025

Date

Vice-President, Finance and Administration

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](mailto:energy@unbc.ca) or [sustainability@unbc.ca](mailto:sustainability@unbc.ca)

