UNBC UNIVERSITY OF NORTHERN BRITISH COLUMBIA


# 2020 PSO Climate Change Accountability Report

Issued: May 2021

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2020

## Accountability Report
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## Forward from Interim President and Vice Chancellor Geoff Payne

As 2020 ends, we must reflect on all the change and challenge we have endured. The students and staff at UNBC have faced this uncertainty with an absolute determination to succeed – together. Our community's patience, kindness, and teamwork are encouraging and a sign that we are continuing to build something great here in the North. We are grateful for everyone's contributions this past year and especially our student body, the heart of our organization. We recognize the immense amount of resilience it takes to continue pursuing your education in these unbelievably challenging times and are excited to have you back on campus when the Go-Forward guidelines allow.

As our students and staff return, we hope to highlight some of the energy conservation initiatives that have been ongoing at campus throughout 2020. These initiatives are as important as ever in a changing global landscape. We must ensure UNBC is a leader in both action and education around sustainable ways of living, use of natural resources, energy independence and more. We endeavour to do this through a lens of Truth and Reconciliation and lifting up the voices of members of our community who have traditionally been excluded. Diversity and inclusion is the key to our future success.

## Declaration Statement

This Climate Change Accountability Report for the period of January 1, 2020, to December 31, 2020, summarizes UNBC's emissions profile, the total offsets to reach net-zero emissions, the actions we took in 2020 to reduce our greenhouse gas emissions and our plans to continue reducing emissions in 2021 and beyond.

By June 30, 2021, the University of Northern British Columbia's final 2020 Climate Change Accountability Report will be posted to our website at www.unbc.ca

## Overview

The University of Northern British Columbia (UNBC), fittingly trademarked as Canada's Green University, has achieved a 40 per cent reduction in electricity use, 24 per cent reduction in natural gas consumption, and a 27 per cent reduction in energy use overall. The net results are an eight per cent reduction in utility costs since the start of its Energy Management (EM) program in 2010. As a result, UNBC has avoided over $5.65 million dollars in energy costs over the past decade.

The energy conservation initiatives in 2020 focused on optimizing building-level mechanical and heating/ventilation system updates for three core campus buildings: the Agora, Research Lab, and Teaching Lab. These efforts have a combined electrical savings of 340,950 kWh, natural gas savings of 650 GJ, and yearly utility savings of $43,000 – all with a payback of 2 years or less.

In addition, lighting was updated to high output industrial LEDs in the process area of the Bioenergy Plant, improving visibility and safety for operational staff. This project consisted of the install of 10 new fixtures that will save 9,300 kWh/yr., and due to low project cost, has a payback of 5.5 years.

In Charles J. McCaffray Hall on the Prince George campus, multiple projects had an interesting compounding effect on energy saving throughout 2020.

First, a lighting and controls upgrade that started in 2019 was fully implemented and operational by January of 2020, followed 2 months later by the COVID-19 pandemic necessitating a sweeping work-from-home response on behalf of the university. The lighting project is estimated to save 100,000 kWh/yr. and $6,000 in utility costs.

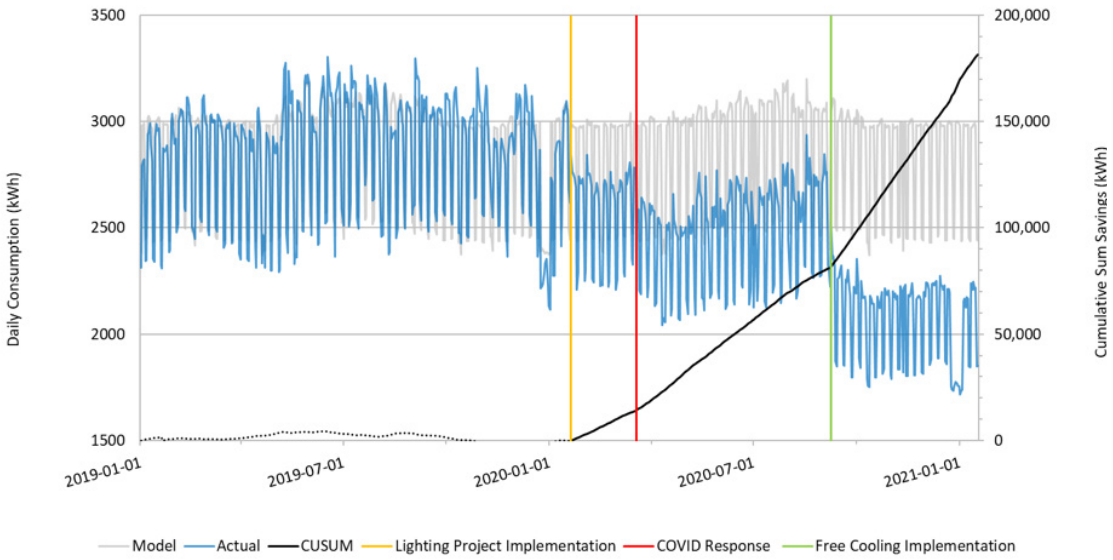
A free cooling project was completed in August 2020. The free cooling project brings in outdoor air for the majority of the year to cool the server room in the basement of McCaffray Hall, replacing the electric air conditioning units. This project exceeded savings projections and is on track to save over 162,000 kWh/yr., valued at approximately $9,700 in utility savings.

Figure 1 shows how actual electricity consumption in McCaffray Hall began to decrease dramatically from the modelled (anticipated) electricity consumption following each of the three developments. At the same time, the steepness of the cumulative savings curve increased, meaning more electrical savings were being realized per day, thereby demonstrating the collective impact.

In summary, the graph illustrates how a total savings of roughly 180,000 kWh were achieved in the first 12 months after project implementation – this is enough electricity to power 16 average B.C. households! In addition, it saves 1.92 tonnes of CO2e emissions.

Figure 1:

**UNBC Administration Building Electrical Consumption**



Lastly, UNBC completed the construction of its second Passive House building, certified and recognized in April 2021 (Figure 2). A remarkable achievement for a small team working in northern B.C. Passive House buildings have a design philosophy of minimal air leakage and strictly controlled air exchanges per hour. It is this philosophy that makes them some of the most energy efficient buildings in the world.

Certified Passive House buildings use up to 90 per cent less heating and cooling energy when compared with standard buildings and use up to 70 per cent less energy overall.[1] With the completion of this project, UNBC positioned itself as a highly skilled and progressive building designer, owner, and operator in an often challenging northern climate.

Figure 2:

**New Facilities Management Building, Prince George Campus[2]**

UNBC's planned carbon reduction initiatives for 2021 include:

- A second round of recommissioning of controls systems for two buildings on the Prince George campus: Northern Sport Centre and Charles J. McCaffray Hall.
- Installation of three new electric vehicle-charging stations.
- Replacing at least two primary heat exchangers on the main campus, which will ensure efficient transfer of heat to those buildings.
- Early phase planning for replacement of the campus-cooling tower.
- Completing full permitting for the transfer of bio-ash from UNBC's Bioenergy Plant to October Farm south of Prince George, thereby permanently diverting it from landfill.
- Installing a capacitance bank in our Wood Innovation Research Lab to improve the power factor for that building, leading to more efficient use of the electricity it consumes.

As ongoing public engagement remains one of the key elements of the EM program, we will organize an energy conservation campaign in partnership with BC Hydro to be delivered during the 2021/2022 academic year. In addition, we are hopeful for a return to normal university operations and return of the much-loved annual Green Day event for its fourteenth year. This event brings together the entire Prince George community to share, discuss, and learn about the wide array of sustainability-focused initiatives that are happening on campus and in the greater community.

UNBC's 4.4 MW bioenergy plant and 0.4 MW pellet plant, which use local sawmill wood waste and pellets respectively, continue to aid in the reduction of UNBC's carbon emissions, though reductions were not as significant in 2019/2020 as in previous years. Due to a major shut down from March 2019 until March 2020 and then again for a short period in late 2020, there was increased natural gas consumption and overall utility costs for the year at the Prince George campus. In spite of this setback, the pellet plant continued to operate efficiently and supply the heat required for two buildings, childcare centre, and the Enhanced Forestry Lab (EFL) greenhouse. With a return to regular operation for the Bioenergy Plant, we anticipate a return to previous greenhouse gas (GHG) levels, as well as further reductions from continued electrical and thermal conservation efforts in 2021.

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*[1]Passive House, Active Research. (2018, July 10). Retrieved from University of Northern British Columbia: https://www2.unbc.ca/newsroom/unbc-stories/passive-house-active-research*

*[2]Siu, Vincent. (2020). Facilities Management Building [photo]. Prince George Campus, British Columbia.*

Figure 3 shows the effect of the Bioenergy Plant shut down on the ratio of natural gas to biofuel consumed. This graph is not normalized for temperature, so overall gigajoules of heat produced is primarily related to weather pattern variations from year to year. The baseline represents what the heat demand would have been in a given year had UNBC not made improvements to the thermal efficiency of its equipment and buildings over time.

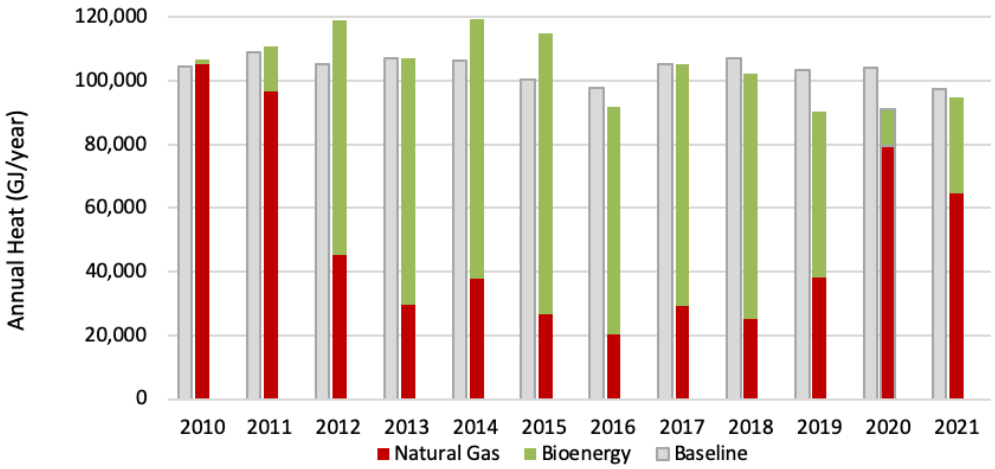


Figure 3:

**Primary Heat Sources for the Prince George Campus, FY2010 – FY2021[3]**

[3]*Fiscal years for UNBC run from April – March, e.g. FY 2021 = April 2020 – March 2021.*

## Emissions and Offsets Summary Table

### University of Northern British Columbia 2020 GHG Emissions and Offsets

| | |
|---|---|
| **GHG Emissions created in Calendar Year 2020** | |
| Total Emissions (tCO2e) | 6,351 |
| Total BioCO2 (tCO2e) | 2,839 |
| Total Offsets (tCO2e) | 3,512 |
| **Adjustments to GHG Emissions Reported in Prior Years** | |
| Total Offsets Adjustment (tCO2e) | 2,141 |
| **Grand Total Offsets for the 2020 Reporting Year:** | |
| Grand Total Offsets (tCO2e) to be Retired for 2020 Reporting Year | 5,653 |
| Offset Investment ($25 per tCO2e) | $141,325 |

Due to specific guidance from the Climate Action Secretariat in the spring of 2020, when the COVID-19 pandemic began to affect British Columbia, UNBC's 2019 reported emissions were less (by about half) than our actual emissions. The Secretariat directed Public Sector Organizations to report their 2018 emissions in place of the 2019 values so that legislative timelines could be met. The goal was to provide more time for PSOs to collect and submit their data, while adjusting to the rapidly changing public heath emergency.

As previously mentioned in this report, the Bioenergy Plant was shut down for maintenance from March 2019 to March 2020 and then again in late 2020, causing campus to rely primarily on natural gas for heating during that time. The result was higher carbon emissions for calendar year 2019 and part of 2020, both of which are accounted for in this year's report. Therefore, UNBC has a higher than average offset investment this cycle.

## 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 2020 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 $25.00 per tonne of offsets retired on its behalf plus GST.

## Executive Sign-off

Signature

May 27, 2021

Date

Rahim Somani

Name (please print)

Vice President- Finance and Administration

Title

If you have an idea of how UNBC can foster more inclusive methods in pursuit of carbon emission reductions or if you have a success story to share, please contact Energy Manager Danika Doucette at **danika.doucette@unbc.ca**