

2013 Carbon Neutral Action Report



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Overview

UNBC is a student-centered research-intensive university, uniquely Northern and personal in character, and responsive to the regions we serve. We are located in one of the world's most magnificent natural settings, but one that is becoming a major center of resource extraction with its concomitant environmental degradation. The confluence of natural setting, resource extraction, and environmental degradation has allowed UNBC to emerge naturally as a small but powerful leader in teaching and researching the full scope of human-environment interaction, and putting what we learn into practice to achieve sustainability.

To celebrate our strengths relating to sustainability and continue to plan for the future, UNBC adopted in 2007 the trademark Canada's Green University. In doing so, we developed a vision to:

- become a sustainable campus;
- engender a 'spirit of sustainability' in the UNBC community;
- serve as a model of sustainability for communities and organizations in Northern British Columbia; and
- become a national and international leader in sustainability teaching and research.

One important component of UNBC's sustainability mandate relates to carbon neutrality, and it is an area where we have shown great leadership. In March 2011, UNBC commissioned a bioenergy heating plant – the first university owned and operated facility in Canada to use bioenergy from waste wood to heat campus buildings. The plant exceeded its target of 85% natural gas offset in its first year of operation. It brings the school great pride to foster a renewable energy priority for our community.


The Bioenergy Plant is one component of the university's plan to help meet its current and future energy needs, as well as contributing to research and development, training, education and demonstration opportunities for northern communities. In 2011 UNBC developed an Energy Policy outlining energy and fossil fuel reduction targets. To help in meeting these targets, UNBC established a \$250,000 revolving fund for energy efficiency projects. The fund is utilized to cover the capital costs of energy projects and the loan is repaid by the cost savings obtained through the energy savings.

On the academic front, the proportion of environmental teaching and research at UNBC is amongst the highest in Canada. UNBC has begun to integrate teaching, research, operations and community engagement through a variety of sustainability programs and projects, including a comprehensive recycling program and a Green Fund set up to provide seed grants to sustainability projects initiated by students, staff and faculty.

The benefit of our sustainability initiatives are far reaching, and relate to our institutional impact on the environment, the expertise we develop and share, and the influence we have on the personal and professional lives of our faculty, staff and students. We recently celebrated our 10,000th graduate, and our hope is they will all take constructive and active roles in addressing the challenges and opportunities of the 21st century. We will continue working towards our mission for sustainability in the North and beyond as Canada's Green University™.

Emissions and Offsets Summary

UNBC GHG Emissions and Offsets for 2013 (TCO2E)	
GHG Emissions created in calendar year 2013	
Total Emissions	5,299
Total Emissions for Offsets	1,978
Adjustments to GHG Emissions Reported in Previous Years	
Total Emissions	-2,796
Total Emissions for Offsets	130
Credit owing from PCT at end of 2012 reporting year	
Credit Owing	\$0
Total Emissions for Offsets for the 2013 Reporting Year (from Offset Invoice):	2,108

	MAY 30 2014
Signature	Date
Eileen Bray	VP Administration + Finance
Name (please print)	Title UNBC

2013 Greenhouse Gas Emissions

In 2013 UNBC generated a total of 5,214 tonnes of Scope 1 carbon emissions, 98.4% of which were associated with energy consumption in the form of bioenergy, fossil fuels, and electricity. Figure 1 summarizes the greenhouse gas emissions related to energy, mobile fuel, and paper consumption.

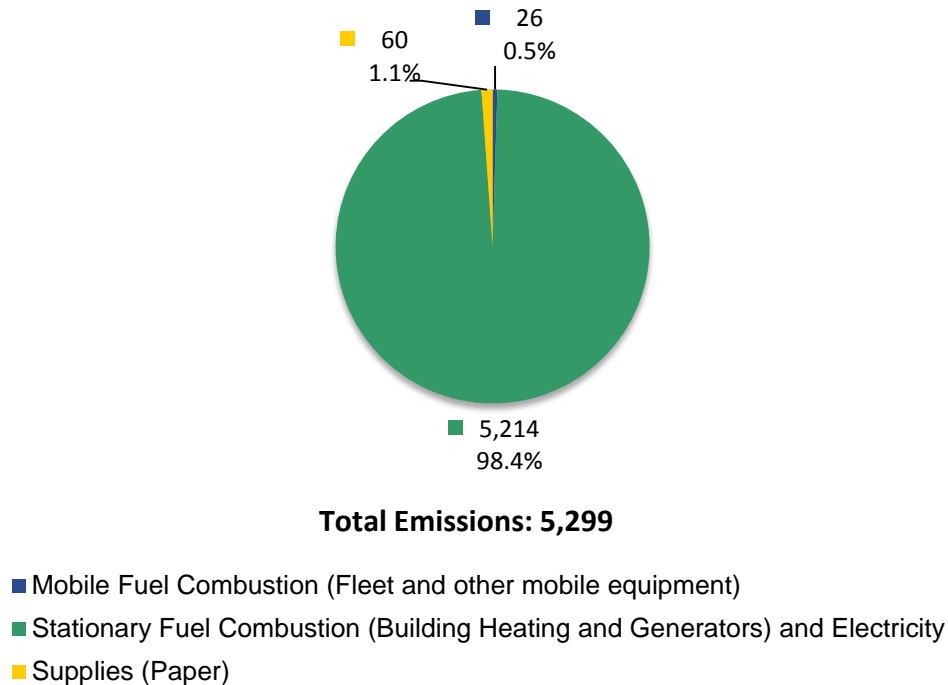


Figure 1 - UNBC Greenhouse Gas Emissions by Source

A 65.4% reduction in Carbon offsets has been achieved since 2010 primarily due to the start-up of the Bioenergy Plant on the Prince George Campus. The Bioenergy plant gasifies wood waste to produce approximately 70% of UNBC’s total heat requirements, which was previously supplied by combusting natural gas. The majority of the emissions resulting from the gasification of wood are considered biogenic and do not require the purchase of offsets. This year 63.6% of the emissions associated with building heating were biogenic.

Compared to 2012, UNBC observed a 10.4% reduction in carbon emissions that require the purchase of offsets. This reduction was primarily driven by the electricity emissions factor being reduced by 40%.

Operational Changes in 2013

During 2013, a number of projects and initiatives were undertaken at UNBC to reduce the carbon emissions associated with fuel combustion, purchased electricity, and the mobile fleet.

Stationary Fuel Combustion

UNBC’s carbon emissions requiring offsets are extremely sensitive to the operation of the Bioenergy Plant since natural gas is used during system downtimes. Due to an emergency shut-down of the

Bioenergy Plant in December 2013, a spike in natural gas consumption was observed, contributing to a 2% increase in stationary combustion offset emissions. During the shut-down, an access door was installed on the oxidizer such that the bioenergy system will not need to be shut down and cooled to perform similar emergency maintenance in the future. This will minimize system downtime, and therefore reduce the amount of natural gas used by the back-up boilers.

In May 2013, low-flow showerheads were installed in the Residences where hot water is supplied by two natural gas boilers. This is anticipated to save up to 1,400 GJ in natural gas annually.

Electricity Consumption

Incremental carbon emission reductions have been seen over the past several years due to the successes of the Energy Manager program funded by BC Hydro. The primary focus of the Energy Manager has been to reduce electricity use through the implementation of projects, taking advantage of BC Hydro programs and incentives. Over the past 3 calendar years projects totaling 1.2 GWh of annual electricity savings have been implemented ranging from lighting retrofits to HVAC optimization. These projects resulted in a 2.8% reduction in electricity consumption compared to 2012.

In 2013 a number of projects were completed including interior and exterior lighting retrofits, daylight harvesting, and an HVAC optimization at a regional research facility. Several large projects were initiated in 2013 and will be implemented in 2014/15: the first phase of the BC Hydro tune-up program Continuous Optimization (C.Op); and the Medical Humidifier Upgrade. The first phase of C.Op which will be implemented by March 2015, is focused on four buildings on the Prince George Campus and is expected to save 950,000 kWh in electricity and 11,000 GJ in heat annually. The Medical Humidifier project will see the current electric steam humidifier replaced with a high pressure atomization system that is expected to save 500,000 kWh in electricity and 100 GJ in heat annually.

Mobile Fleet

In March 2013, UNBC purchased six used 100% electric Might-E-Trucks from UBC to supplement or replace several gasoline-consuming vehicles. Four of the six trucks are being driven by the Facilities Department, one truck is being driven by the Enhanced Forestry Lab, and one truck serves Security and Parking. Security and Parking reduced fuel purchases by 70% compared to last year. Facilities did not observe a reduction in fuel consumption since the electric vehicles were used to expand the fleet, and thus served to avoid the purchase of new internal combustion vehicles.

Actions to Reduce Provincial Emissions and Improve Sustainability

UNBC has been involved in a number of initiatives to promote sustainability and emissions reductions that fall outside the reporting scope defined by the Greenhouse Gas Reduction Targets Act, ranging from infrastructure improvements, to community and student engagement.

Infrastructure Improvements

In 2013, UNBC installed biking infrastructure to encourage cycling to campus. Two covered bike shelters and a bike repair stand were strategically installed near busy entrances and in view of security cameras. To further promote active commuting, lockers were installed outside of one of the two shower facilities. In addition to participating in the province-wide Bike to Work Week, UNBC organized a Bike to School Week in September 2013 to encourage year-round biking by students, staff and faculty.

To support electric vehicles on campus, UNBC installed two new electric vehicle charging stations in Parking Lot B. These stations offer priority parking with free charging to anyone visiting the campus. UNBC also encourages car-pooling by providing discounted parking rates and reserved parking spots to those sharing rides to campus.

Student Engagement

The Prince George Public Interest Research Group (PGPIRG) has a great presence at UNBC, bringing together students, staff and faculty to foster a culture of sustainability. PGPIRG is a student-funded public interest and research group that facilitates student-led initiatives on campus such as the Borrow-a-Mug program, campus composting, learning gardens, the Good Food Box program, and a Meatless Mondays campaign.

Due to Prince George's climate, geography and the climbing costs of fuel, the question of what is on our plates and how it gets there is a popular topic of discussion at UNBC. UNBC continues to run a weekly Farmer's Market every Tuesday during the fall and winter semesters, where local foods and artisanal products are highlighted. A Campus Food Strategy Group (CFSG) was developed to collaborate with our food service provider to support local, sustainable, healthy and accessible food options for students, faculty and staff.

Community Engagement

UNBC offers many programs to engage the public on sustainable initiatives and topics. In 2013 over 400 visitors toured the Bioenergy Plant where the benefits of using local, renewable, and low carbon emission fuel are highlighted.

In May 2013, a field course was offered where Environmental Engineering students from UNBC, Power Engineering students from Confederation College, and Westbank First Nations representatives spent two weeks in Austria learning how to design bioenergy systems. The Environmental Engineering students then completed prefeasibility studies on bioenergy and district heating systems for a number of small communities and organizations in northern British Columbia.

UNBC continues to offer environmental programming to local youth through outreach programs and summer camps. UNBC regularly partners with School District 57 High Schools to facilitate Green Outreach presentations and discussions about climate change and environmental issues. Each summer, UNBC runs eight one-week long Active Minds summer camps for kids ages 6 and older where sustainability, energy, and climate change modules are taught to encourage a life-long interest in environmental topics.

Summary

As Canada's Green University™, the University of Northern British Columbia is committed to "green" and sustainable activities in every aspect of our operations. Using energy efficiently and employing clean, renewable energy has reduced carbon emissions at UNBC by 65.4% since 2010. UNBC will continue to minimize our environmental impact by reducing energy consumption through energy efficiency projects, student engagement, and awareness campaigns; and showcasing renewable and efficient energy systems that are of particular interest to northern and remote communities.

2013 Carbon Neutral Action Report (CNAR) - Part 2 ACTIONS

Created Thursday, April 17, 2014

Updated Friday, May 30, 2014

<https://fluidsurveys.com/surveys/cas-z/2013-cnar-form-bps-actions/290ef5c16f0385e8e1e84946853e208b/>

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Please complete the following sections of the 2013 Carbon Neutral Action Report form. Save your work frequently to prevent it from being lost. You can also save a copy for your own use as either a WORD or PDF file using the buttons at the bottom of each page.

This is Part 2 of the Carbon Neutral Action Report form. This section reports on actions taken to reduce emissions during the 2013 calendar year. This information will be included in your final Carbon Neutral Action Report posted on the Ministry of Environment website.

When the form is complete press the submit button on the last page to automatically submit the information to the Climate Action Secretariat (CAS). Do not press submit before you are ready – this may result in a loss of work.

In addition to completing this survey (Part 1 2), you are required to submit your completed Overview (Executive Summary) and Self-Certification Checklist. The 2013 Overview template was included in the email sent and can also be found on the LiveSmart leaders Community.

Please ensure you meet the following reporting deadlines:

A DRAFT 2013 CNAR is due to CAS by March 31, 2014. The draft is comprised of the Overview ONLY (no executive sign-off required).

The FINAL 2013 CNAR is due to CAS by May 30, 2014. The final 2013 CNAR includes Part 1 Part 2 survey form and Overview.

The Self-Certification Checklist is due to CAS by May 15, 2014.

For more information about the Carbon Neutral Government process, please refer to *Becoming Carbon Neutral 2013*, or should you have any questions please contact climateactionsecretariat@gov.bc.ca.

Organization Name

University of Northern British Columbia

Actions Taken to Reduce Emissions

1) Stationary Fuel Combustion, Electricity (Buildings):

Indicate which actions were taken in 2013:

Performed energy retrofits on existing buildings

Yes

Built or are building new LEED Gold or other "Green" buildings.

No

Undertook an evaluation of overall building energy use.

Yes

Please list any other actions taken to reduce emissions from Buildings:

UNBC is currently enrolled in the BC Hydro Continuous Optimization program where energy conservation measures related to building operations are identified and implemented. UNBC is completing C.Op in 3 phases, where the first phase implementation for 4 of the 9 enrolled buildings began in 2013. The first, second and third implementation phases will be completed in March 2014, 2015, and 2016, respectively.

2) Mobile Fleet Combustion (Fleet and other vehicles):

Indicate which actions were taken in 2013:

Do you have a fleet?

Yes

Replaced existing vehicles with more fuel efficient vehicles (gas/diesel)

No

Replaced existing vehicles with hybrid or electric vehicles

Yes

Reduced the overall number of fleet vehicles

No

Took steps to drive less than last year

No

Please list any other actions taken to reduce emission from fleet:

(No response)

3) Supplies (Paper):

Indicate which actions were taken in 2013:

Used less paper than previous year

Yes

Used only 100% recycled paper

No

Used some recycled paper

Yes

Used alternate source paper (Bamboo, hemp, etc.)

No

Please list any other actions taken to reduce emissions from paper use:

(No response)

Actions Taken to Reduce Emissions - continued

Explain how you plan to continue minimizing emissions in 2014 and future years:

UNBC has a number of planned and committed energy projects over the next several years that are expected to reduce the emissions associated with electricity, fossil fuel, and bioenergy consumption. In response to the number of potential projects, UNBC created an Energy Conservation Revolving Loan Fund in 2012 where \$250,000 was made available to fund energy projects, and savings are used to repay the loan and to fund future conservation projects. Over the next five years, Loan Fund spending is expected to exceed \$1.7M in energy project funding, and energy management budget funding. Implemented projects will minimize the impact of increasing utility costs and the associated emissions related to energy consumption.

Substantial reductions will be achieved by fine-tuning building operations through BC Hydro's Continuous Optimization program (C.Op). The C.Op program will optimize 9 of the highest energy consuming buildings that account for 84% of UNBC's total energy consumption. UNBC will continue to leverage available incentives offered by BC Hydro for implementing electricity reduction projects.

Significant reductions will be seen with the expansion of the Bioenergy system, where 4 buildings currently using natural gas will be connected to a new hot water distribution system heated by an existing wood pellet boiler. Distribution piping will be installed in 2014 with the natural gas equipment in each building being replaced over the next couple of years. This is expected to reduce fossil fuel emissions by approximately 320 tCO₂e per year.

If you wish to list any other "sustainability actions" outside of buildings, fleet, paper and travel check "yes". This reporting is optional.

Yes

Actions to Promote Sustainability and Conservation - Optional

The following are actions that fall outside the scope of the *Carbon Neutral Government Regulation*, but which many organizations still undertake and may wish to report on. This section is optional for reporting.

Business Travel

Created a low-carbon travel policy or travel reduction goal (Low-carbon: Lowest emission of greenhouse gases per kilometre per passenger)

(No response)

Virtual Meeting Technology

Installed web-conferencing software (e.g., Live Meeting, Elluminate, etc.)

Yes

Made desktop web-cameras available to staff

(No response)

Encourage alternative travel to meetings (e.g., bicycles, public transit, walking)

No

Encourage carpooling to meetings

Yes

Education and Awareness

Have created Green, Sustainability, Energy Conservation, or Climate Action Teams.

Yes

Provided resources and/or dedicated staff to support these teams

Yes

Provided behaviour change education/training for these teams (e.g., community-based social marketing)

Yes

Established a sustainability/green awards or recognition program

Yes

Support green professional development (e.g., workshops, conferences, training)

Yes

Planning for Climate Change

Have assessed whether extreme weather events and/or long term changes in climate will affect our organization's business areas

(No response)

Long term changes in climate have been incorporated into our organization's decision making.

(No response)

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Actions to Promote Sustainability and Conservation - Optional (continued)

Staff Awareness and Education

Provided education to staff about the science of climate change

Yes

Provided education to staff about the conservation of water, energy, and raw materials

Yes

Provided green tips on staff website or in newsletters

Yes

Alternate Work/Commuting Options

Allow for telework/working from home

(No response)

Staff have the option of a compressed work week

(No response)

Commuting by foot, bicycle, carpool or public transit is encouraged

Yes

Shower or locker facilities are provided for staff/students who commute by foot or by bicycle

Yes

Secure bicycle storage is provided

Yes

Other Sustainability Actions

Establish a water conservation strategy which includes a plan or policy for replacing water fixtures with efficient models

(No response)

Put in place a potable water management strategy to reduce potable water demand of building-level uses such as cooling tower equipment, toilet fixtures, etc. and landscape features

(No response)

Have put in place an operations policy to facilitate the reduction and diversion of building occupant waste from landfills or incineration facilities

Yes

Have implemented a hazardous waste reduction and disposal strategy (Hazardous Waste: E.g., electronics including computer parts and monitors, batteries, paints, fluorescent bulbs)

Yes

Have incorporated minimum recycled content standards into procurement policy for consumable, non-paper supplies (e.g., writing instruments, binders, toner cartridges, etc.)

(No response)

Established green standards for goods that are replaced infrequently and/or may require capital funds to purchase (e.g., office furniture, carpeting, etc.)

Yes

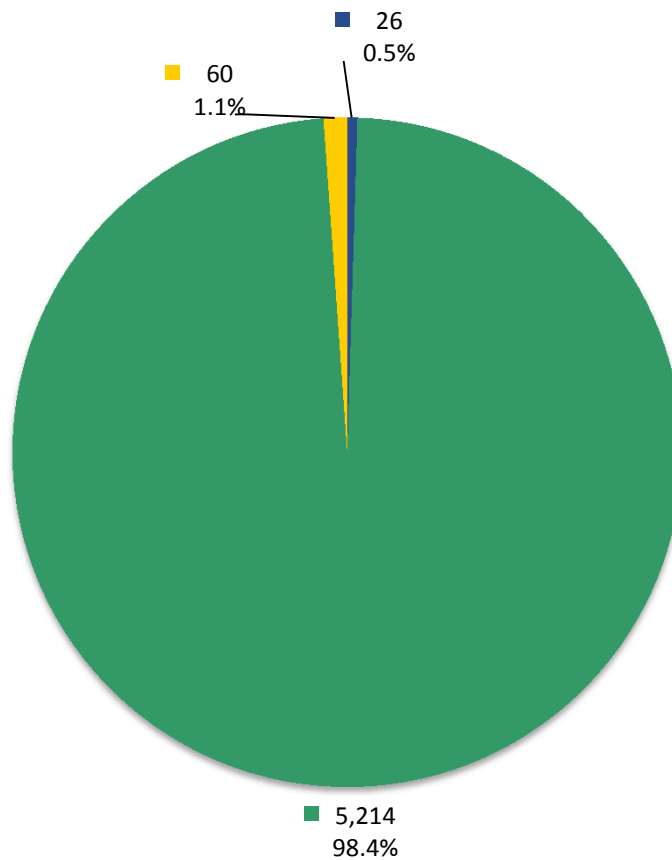
Incorporated lifecycle costing into new construction or renovations

Yes

Please list and other sustainability actions you wish to report not included in the previous list.

(No response)

University of Northern British Columbia Greenhouse Gas Emissions by Source for the 2013 Calendar Year (tCO₂e*)



Total Emissions: 5,299

- Mobile Fuel Combustion (Fleet and other mobile equipment)
- Stationary Fuel Combustion (Building Heating and Generators) and Electricity
- Supplies (Paper)

Offsets Applied to Become Carbon Neutral in 2013 (Generated May 21, 2014 3:05 PM)

Total offsets required: **1,978**. Total offset investment: **\$49,450**. Emissions which do not require offsets: **3,321** **

*Tonnes of carbon dioxide equivalent (tCO₂e) is a standard unit of measure in which all types of greenhouse gases are expressed based on their global warming potential relative to carbon dioxide.

** Under the *Carbon Neutral Government Regulation of the Greenhouse Gas Reduction Targets Act*, all emissions from the sources listed above must be reported. As outlined in the regulation, some emissions do not require offsets.