University of New Brunswick
Climate Change Action Plan
2020 – 2025

Traditional Land Acknowledgement

We respectfully acknowledge that UNB stands on the unsurrendered and unceded traditional Wolastoqey land.

The lands of Wabanaki people are recognized in a series of Peace and Friendship Treaties to establish an ongoing relationship of peace, friendship and mutual respect between equal nations.

The river that connects our two campuses is known as Wolastoq, along which live Wolastoqiyik – the people of the beautiful and bountiful river. Wolastoq is also called the Saint John River.

President's Message

Scientists have deemed climate change one of the largest threats to humanity. In October 2018, the Intergovernmental Panel on Climate Change stated that humans need to limit global warming to 1.5°C to ensure a more sustainable and equitable society. To reach this goal, global net greenhouse gas emissions would need to be reduced by 45% from 2010 levels by 2030, with net zero emissions by 2050. Within this plan, we have set some ambitious goals of our own to help take a leadership role in the region and across the country. These ambitious reduction targets show our commitment to creating a more efficient, resilient, and sustainable university and to inspire students to make a commitment to climate action in their lives and careers.

The institutional Climate Change Action Plan was developed through a three year, inclusive and collaborative approach that took input from all corners of our campuses and communities. Climate change is a problem that is going to take each one of us contributing to solve, thus having many people involved in the plan's development was very important.

Both UNB campuses have already made notable progress in the area of climate change. Our campuses have established Energy Management Programs, which have reduced the energy consumption for our university while also saving millions of dollars. UNB is a leader in Smart Grid technology and our faculty have conducted climate change related research in a number of departments on both campuses. There is still a great deal of work to be done and we as an institution are prepared to take on the challenge.

The university is an ideal setting to implement climate change solutions and take a leadership role. Together, we can take strides to make a lasting impact at home and around the world.

With kind regards,

Paul

Dr. Paul J. Mazerolle
President and Vice-Chancellor
University of New Brunswick

Table of Contents

Background Information

The Greenhouse Effect

The Earth's atmosphere is a thin layer of gases that allows solar radiation to pass through it and warm the Earth. Approximately 70% of this radiation is absorbed by the Earth's surfaces with the remaining 30% reflected back into space. The balance of this incoming and outgoing radiation allows Earth to be habitable, however, increased levels of greenhouse gases caused by human activities disrupts this natural balance by drastically altering the Earth's atmosphere. This disruption and altering of the atmosphere are resulting in a changing climate (Government of Canada, 2015).

Causes of Climate Change

Climate change is the long-term shift in weather conditions causing shifts in temperature, precipitation, winds, and other indicators. The long-term state and average temperature of the Earth's climate is regulated by the balance between incoming and outgoing solar radiation, or energy. Therefore, any factor that causes a change in incoming or outgoing energy will cause a shift in the Earth's energy balance. Human activity has been deemed the main cause of climate change, dominantly through the burning of fossil fuels and conversion of land for forestry and agriculture. Burning fossil fuels creates carbon dioxide, which is the main gas associated with human induced climate change (Government of Canada, 2016).

According to Canada's National Inventory Report, electricity makes up the majority of Canada's greenhouse gas emissions, largely by using non-renewable resources in the generation process. Electricity generation not only produces carbon dioxide, but also nitrogen oxides and sulphur dioxide, which contribute to smog, acid rain, and the formation of fine particulate matter (Government of Canada, 2013).

The transportation sector is the second largest greenhouse gas emitter in Canada. These emissions are from burning fossil fuels, like gasoline and diesel, to power vehicles. These emissions could be reduced through investment in electric or hybrid vehicles, carpooling or taking the bus, or through use of active transportation (Environmental Protection Agency, 2017).

The third largest greenhouse gas emitter in Canada is the oil and gas sector, which contributes to climate change through the refining and processing of non-renewable energy sources. However, the majority of emissions in this sector come from the combustion of the energy source, emitting greenhouse gases into the atmosphere (Borremans, Prudhomme, et al, n.d.).

The Current State of Climate Change in New Brunswick

According to the Intergovernmental Panel on Climate Change (IPCC), human-induced warming has reached approximately 1°C above pre-industrial levels in 2017, increasing at a rate of approximately 0.2°C per decade. According to a recent study by IPCC, global warming must remain below 1.5°C to limit risks of long-lasting and irreversible changes. To limit global warming to a maximum of 1.5°C, global net greenhouse gas

emissions would need to be reduced by 45% from 2010 levels by 2030, with net zero emissions by 2050. To achieve this, extreme measures have to be undertaken globally within all areas, including but not limited to energy, industry, buildings, agriculture, and transportation. The decisions made today are critical in ensuring a safe and sustainable world for both present day and for future generations (Allen, Dube, et al, 2018). New Brunswick is currently in the second highest category nationally for greenhouse gas emissions per capita.

The Current State of Climate Change at UNB

In fall 2009, UNB was approached by Interuniversity Services Incorporated (ISI) in association with the Atlantic Universities and Colleges Sustainability Network (AUCSN) to support a Presidents' Climate Change Statement.

In support of this statement, UNB developed an emission reduction plan to meet the Province of New Brunswick's Climate Change Action Plan (2007-2012) based strictly on building utility savings through the Energy Management Program and upgrades to the Central Heating Plant.

Although the President's Climate Change Statement through ISI did not materialize, UNB carried out an emission reduction plan successfully mitigating rising utility costs and avoiding carbon dioxide emissions. As UNB has met the 2012 targets and continues to work towards the 2020 goals, we must now work to achieve or exceed the newest targets established by our governments.

Methods to Creating UNB's Climate Change Action Plan

UNB's Climate Change Action Plan was developed over a span of three years using a phased approach.

Phase 1 of the plan's development included the formation of the Climate Change Action Plan Committee (CCAPC), made up of a variety of stakeholders both on and off the Fredericton and Saint John campuses to guide the creation of the plan. The first year of the plan's development was also dedicated to public consultation and engagement sessions to determine what the campus and general community deemed as essential focus areas for the plan. Through the consultation and engagement sessions it was determined that the areas of focus for the plan would include energy and infrastructure, transportation, education and programs, waste management, and sustainable grounds.

Phase 2 of the plan's development was focused on developing baselines, targets, and strategies that would serve as the main content of the plan. To determine these, task forces for each focus area were established. Each task force contained staff, faculty, students, and community members who were considered experts in the proposed topics. Upon completion, the task force data was presented to the CCAPC for input and approval.

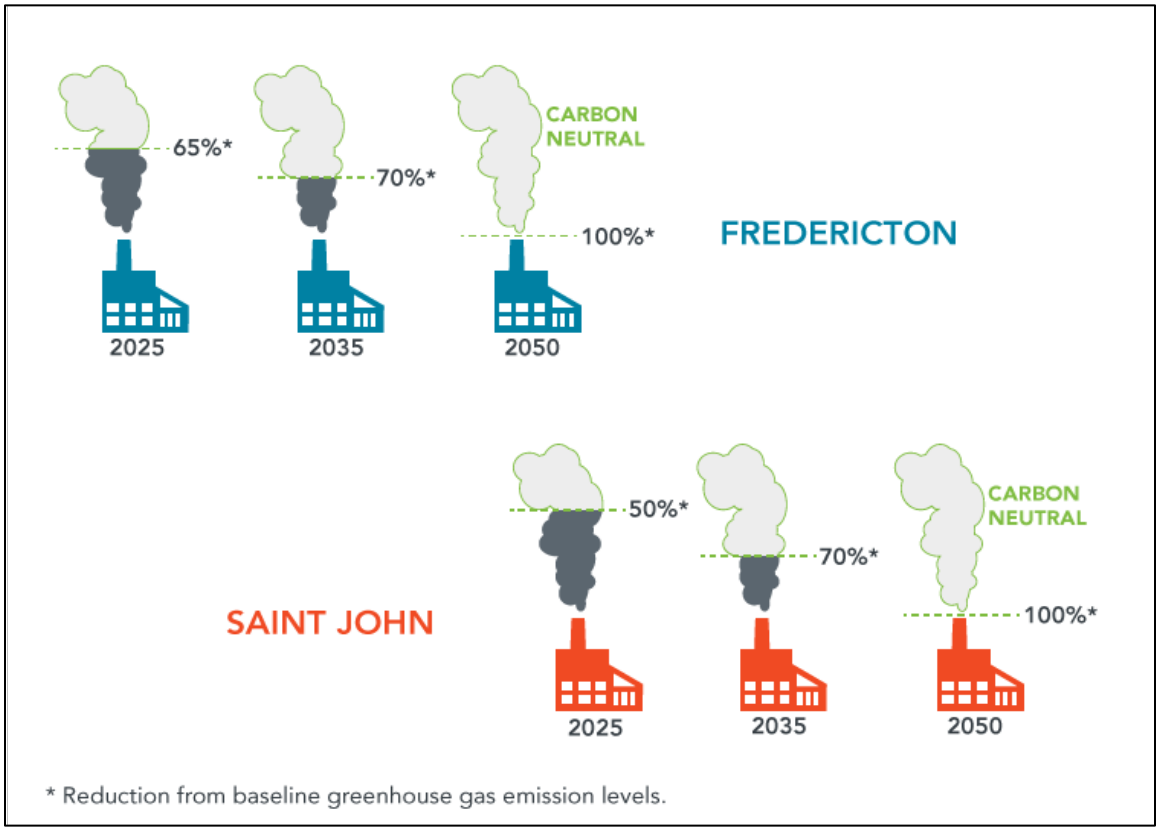
The final phase of the plan's development was dedicated to the creation and implementation of the plan across both the Fredericton and Saint John campuses.

Baselines and Targets

The emissions baselines were determined and aligned with those selected for the Sustainability Tracking, Assessment, and Rating System (STARS), with the intention of utilizing the information collected from STARS to provide insight on the progress UNB has already made, and the areas that can be improved upon.

Within the STARS framework, it is recommended to use an average of three consecutive years of data when calculating a baseline. UNB Fredericton selected the years 2007/2008, 2008/2009, and 2009/2010 due to the significant work the campus has undergone since the establishment of the Energy Management Program in 1996. This baseline allows the campus to account for some of this investment, while also pursuing challenging targets that require the university to make significant changes to reach. On the Saint John campus, the baseline includes the 2008/2009 and 2009/2010 years. An average of these two years is used on this campus due to insufficient data.

Because both campuses are drastically different in their operations in that UNB Fredericton produces their own steam to heat buildings, while UNB Saint John purchases their steam from the hospital, the reduction targets will be different. However, because this is a bi-campus plan, the campuses will share a common target of becoming carbon neutral by the year 2050. On the Fredericton campus, the targets are to reduce greenhouse gas emissions by 65% of the baseline by 2025, 70% of the baseline by 2035, and to be carbon neutral by 2050. On the Saint John campus, the targets are to reduce greenhouse gas emissions by 50% of the baseline by 2025, 70% of the baseline by 2035, and to be carbon neutral by 2050.



Climate Change Goals and Strategies

UNB's Climate Change Action Plan has five areas of focus that were defined through extensive public engagement sessions with the UNB community and stakeholders.

Energy and Infrastructure

With a goal of being carbon neutral by 2050, UNB is actively committed to increasing energy efficiency and reducing fossil fuel consumption on both campuses. By 2025, UNB will have made major changes to the infrastructure on campus and worked to shift the behaviours of occupants on campus to increase user efficiency.

Successes at UNB:

- UNB Fredericton has an active Energy Management Program that has saved the institution millions of dollars and has drastically increased energy efficiency on campus.
- UNB has two LEED Gold certified buildings, the Hans W. Klohn Commons and the Kinesiology Building, with the latter also being WELL certified. In addition, UNB Fredericton has 11 certified BOMA BESt buildings.
- UNB Fredericton has a Building Automation System that allows the buildings steam (heat) and energy consumption to be tracked. This allows for all buildings to be monitored and maintained at efficient levels.
- UNB Fredericton and Saint John participate in a residence energy challenge, encouraging residence students to reduce their energy consumption.
- UNB Saint John upgraded the steam traps on campus, increasing the efficiency of the buildings.

Table 1. The energy and infrastructure strategies that will aid in achieving the 2025 targets with campuses identified.

GOALS	STRATEGIES	CAMPUS
Improve campus energy systems	Increase biomass as a fuel source in the Central Heating Plant.	FR
	Invest in renewable energy.	FR & SJ
	Invest in a co-generation system, which uses a steam turbine to generate electricity.	FR
	Refrigerant phase out.	FR & SJ
Reduce the consumption of energy on campus	LED retrofits.	FR & SJ
	Building control upgrades.	FR & SJ

	Reduce energy consumption through occupant education.	FR & SJ
Improve campus infrastructure standards	Establish an institutional green building policy.	FR & SJ
	Establish preventative maintenance standards that incorporate sustainability.	FR & SJ

Transportation

UNB recognizes that there needs to be additional assessment and understanding of behaviour patterns when it comes to sustainable transportation. Therefore, the next 5 years will be committed towards collecting information through a variety of assessments and surveys to better address the resistance towards sustainable transportation.

Successes at UNB:

- UNB Saint John promotes sustainable transportation during its Transportation Month.
- UNB Fredericton offers a transportation option within the Department of Civil Engineering as well as an opportunity to study transportation within the Master of Engineering program.
- UNB Saint John has a car sharing program in place to promote carpooling opportunities.
- UNB has multiple bike racks located around the Fredericton and the Saint John campuses, and UNB Fredericton even has a bike repair station in front of the Kinesiology Building.

Table 2. The transportation strategies that will aid in achieving the 2025 targets with campuses identified.

GOALS	STRATEGIES	CAMPUS
Increase the number of active transportation users on campus	Implement a transportation survey that studies travel methods and behaviours.	FR & SJ
	Develop a transportation plan.	FR & SJ
	Promote active transportation through increased programming and education.	FR
Reduce emissions produced by the campus community	Conduct a fleet assessment.	FR & SJ
	Develop an anti-idling policy.	FR & SJ
	Develop a new sustainable travel policy.	FR & SJ

	Explore opportunities to reduce daily campus travel.	SJ
	Upgrade and expand video conferencing technology.	FR & SJ

Education and Programs

UNB has long been celebrated for its success as a research facility and the many academic programs it offers. To create graduates who are prepared to handle the consequences of climate change, UNB hopes to incorporate climate change topics into every faculty on campus.

Successes at UNB:

- UNB publishes an annual institutional Green Review which promotes all the great sustainability work happening on each of our campuses.
- UNB has an established Environment and Natural Resource undergraduate degree program, as well as a Master of Environmental Management graduate degree program. These degrees offer the opportunity to explore climate change related issues and solve complex problems.
- UNB Sustainability was established on the Fredericton campus in 2014 and has since provided various programming to the campus.
- UNB Saint John's Facilities Management team provided the campus with recycling options.
- UNB Saint John has an active student Green Society that aids the campus in sustainability programming and recycling efforts.
- UNB Fredericton has a Green Representatives Program that offers students the opportunity to be green leaders in their residences.
- UNB Fredericton hosted its first annual Sustainability Week in 2018.

Table 3. The education and program strategies that will aid in achieving the 2025 targets with campuses identified.

GOALS	STRATEGIES	CAMPUS
Create educational opportunities around climate change	Integrate climate change into the curriculum.	FR & SJ
	Develop a climate change hub.	FR & SJ
	Explore opportunities for co-curricular partnership.	FR & SJ

Waste Management

UNB has been limited in the area of waste management based on regional facilities and pick up opportunities. Despite these limitations, by 2025, UNB would like to explore alternative opportunities to reduce waste produced on campus by exploring the types of waste currently produced and by exploring opportunities to recycle and reduce these sources.

Successes at UNB:

- UNB Saint John has a Free Cycle room where they collect items that would otherwise be thrown out and allow individuals to take and reuse these items as needed.
- UNB Fredericton and Saint John have community gardens with small scale composting.
- The UNB Student Union has a partnership with the Ville where they collect student, staff, and faculty compost in the fall months and deliver it to the Ville community garden.
- UNB Fredericton has been converting all single stream garbage bins to three sort bins (that include a receptacle for garbage, paper, and refundable materials) and has seen a drastic shift in the amount of materials that are recycled.
- UNB Saint John continues to recycle all electronic components on campus and ensures the proper disposal of these items.
- UNB Fredericton has completed a waste audit of their campus that provides a full picture of the amount and types of waste produced on campus. And UNB Saint John has completed preliminary waste assessments.

Table 4. The waste management strategies that will aid in achieving the 2025 targets with campuses identified.

GOALS	STRATEGIES	CAMPUS
Explore alternative opportunities to reduce waste produced on campus, the types of waste currently produced, and opportunities to recycle and reduce the sources of waste	Explore opportunities for small unit composting.	FR & SJ
	Explore opportunities to recycle plastics and continue to recycle cardboard and paper.	FR & SJ
	Develop a waste source inventory that highlights the types of waste currently produced.	FR & SJ
	Develop materials that support waste management education.	FR & SJ

Sustainable Grounds

UNB has a reputation for maintaining their grounds to a high standard. By 2025, UNB would like to develop a campus master plan that incorporates the environmental changes that are anticipated due to increased extreme weather events and increased temperatures, causing new species to thrive in our climate.

Successes at UNB:

- UNB plants approximately 10 trees every year.
- UNB Fredericton has a Memorial Tree Trail, a Provincial Tree Trail, and an Acadian Tree Trail.
- UNB Fredericton has three wildlife friendly gardens and a medicine wheel garden.
- Both campuses have a community garden on their grounds.

Table 5. The sustainable grounds strategies that will aid in achieving the 2025 targets with campuses identified.

GOAL	STRATEGIES	CAMPUS
Develop a campus master plan	Integrate tree planting protocol into the campus master plan.	FR & SJ
	Establish a feasibility study for carbon sinks at UNB.	FR & SJ

Monitoring and Reporting

UNB is committed to reducing greenhouse gas emissions on both campuses and becoming a more sustainable university and province. To monitor and report on the ability to reach these targets and strategies, UNB Sustainability will release a mid-point review of the strategies completed and the remaining tasks to be addressed with a path forward outlined.

Additionally, at the conclusion of the plan, UNB Sustainability will release a final report outlining the successes within the plan and will publish a new plan to tackle the years that follow, guiding the campuses to the 2050 carbon neutral goal.

Key Performance Indicators

Key performance indicators (KPI's) will be reported to the CCAPC to provide an update on the progress towards meeting our strategies and goals at the mid-way point and at completion in 2025. The KPI's are aligned with the overall targets for the institution. In addition, UNB's greenhouse gas emissions (tonnes of CO2e) will be reported to the CCAPC annually.

The CCAPC will play a major role in the monitoring of UNB Sustainability's progress towards achieving the outlined strategies and goals. They will continue to meet three to four times per year, assessing progress and giving strategic guidance when necessary.

Acknowledgements

UNB Sustainability would like to say a special thanks to the Environmental Trust Fund for partially funding all three phases of this project. Additionally, we would like to thank the CCAPC and all task force members who provided their expertise and helped guide this project to completion. Finally, we would like to thank both the Fredericton and Saint John communities for providing us with feedback along the way that ultimately lead to the creation of the targets and strategies within this plan.

Thank you to the following units:

- Department of Environment and Local Government
- Faculty of Engineering
- Faculty of Forestry and Environmental Management
- Facilities Management
- Conservation Council of New Brunswick
- ACAP
- UNB Student Life
- AVP Academic
- UNB Procurement
- UNB Research
- UNB Risk Management
- UNB Presidents Office
- Mi'kmaq-Wolastoqey Centre
- UNB Student Union
- UNB Student Representative Council
- UNB Green Society
- UNB Graduate Society
- Faculty of Arts, Economy

References

Government of Canada (2016). *Causes of Climate Change*. Retrieved from: https://www.canada.ca/en/environment-climate-change/services/climate-change/causes.html

Government of Canada (2015). *The Greenhouse Effect.* Retrieved from: https://www.canada.ca/en/environment-climate-change/services/climate-change/greenhouse-effect.html

Tubielle, F.N., Salvatore, M., et al. (2014). *Agriculture, Forestry and Other Land Use Emissions by Sources and Removals by Sinks.* Retrieved from: http://www.fao.org/docrep/019/i3671e/i3671e.pdf

Government of Canada. (2013). *Electricity Generation.* Retrieved from: https://www.canada.ca/en/environment-climate-change/services/managing-pollution/energy-production/electricity-generation.html

Borremans, E., Prudhomme, J., et al. (n.d.). *Global Climate Disclosure Framework for Oil & Gas Companies.* Retrieved from: http://www.iigcc.org/files/publication-files/Global_Climate_OG_DisclosureFramework.pdf

Government of New Brunswick, (2008). *Climate Change Adaptation Strategy for Atlantic Canada.* Retrieved from: https://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Climate-Climatiques/ClimateChange%20AdaptationStrategyAtlanticCanada.pdf