

# Annual Sustainability Report: Appendix A

Climate Change Action Plan  
2022/23

Department of Facilities and Engineering, NSCC

*September 1, 2023*

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## Executive Summary

Human activities during the past century have caused global warming to accelerate by emitting greenhouse gasses into the atmosphere. These greenhouse gasses, such as carbon dioxide, trap heat in the atmosphere and change the world's climate. Nova Scotia and the rest of the world are now experiencing the impacts of climate change. From fluctuating weather patterns that impact food production, to rising sea levels that intensify the risk of flooding, the impacts of climate change are unparalleled in scale. We will continue to live with the effects of the greenhouse gas effect caused by human activity for the rest of this century, regardless of what actions we take to reduce our emissions in the next several decades.

The NSCC Climate Change Action Plan outlines a pathway for our institution to make a significant impact on the sustainable development of our province as we work with our communities to address climate change. The Plan builds upon the foundation of already established College plans, policies and procedures and was formed after consultation with the NSCC community, participation in provincial and municipal climate planning initiatives and review of existing climate strategies from other post-secondary institutions and the Nova Scotia Department of Environment and Climate Change<sup>i</sup>. The Action Plan was created by the NSCC Facilities and Engineering Department in collaboration with the NSCC Sustainability Team.

The content of the Action Plan focuses on three key themes: Mitigation, Adaptation, and Education. Each theme contains several strategies tailored to the unique nature of our institution. The scope of the mitigation actions detailed in this plan focus on capital planning and operational objectives, which will be delivered by NSCC Facilities and Engineering. Adaptation actions include long-term planning objectives to deliver climate resiliency at both campus and institutional levels, which will involve campus management team and central planning staff. Education actions will focus on collaboration between all NSCC staff units, including climate change related governance, teaching and research. With 13 campuses across the province teaching a variety of programs, from agriculture to information technology, NSCC covers a much broader geographic and educational range than other institutions. This range presents us with the opportunity to communicate the message of sustainability to a wide and diverse audience. We have embraced this opportunity and are committed to being leaders in reducing greenhouse gas emissions and adapting to climate change in our communities.

Together, these themes and strategies complement each other and have the potential to build upon existing NSCC capacity to create a culture of innovation and continuous improvement that will inspire the workforce of tomorrow.

# 1. Guiding Principles

## Nova Scotia's Climate Context

Nova Scotia and the rest of the world are experiencing the impacts of climate change. From fluctuating weather patterns that impact food production, to rising sea levels that intensify the risk of flooding, the impacts of climate change are unparalleled in scale. Climate change is caused by an increased proportion of human-produced greenhouse gases (GHGs) being released into our atmosphere, such as carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>)<sup>ii</sup>. Without immediate reductions of greenhouse gas emissions, adapting to these changes in the future will be more difficult and come at a high cost. Even with drastic reductions of global emissions, many of the changes to our climate are now locked in and will continue to escalate for the rest of this century<sup>iii</sup>.

Locally, Nova Scotians will experience higher average temperatures and more heat waves, as well as more intense and significant precipitation events. Major flooding and wildfires will become more common. Sea levels will continue to rise, threatening our coastal communities and ecosystems. Our current infrastructure was not designed to deal with climate change threats so we will experience more power outages, greater property damage, and more substantial disruptions to commercial operations. Water quality and availability will worsen, food systems will be stressed, and ecosystems and biodiversity will suffer. The recent [provincial climate risk assessment](#)<sup>iv</sup> from the Nova Scotia Department of Environment and Climate Change explores the effects that climate change will have on the well-being of Nova Scotians. With continued high global emissions, Nova Scotia can expect these climate changes over the next century:

- Temperatures will continue to rise.
- We will have less snow and more rain.
- The rain will be more intense.
- Storms will be more frequent and intense.
- The sea level will continue to rise.
- Ocean temperatures, oxygen, and acidity levels will change.

The risk assessment also explains how climate hazards will evolve over time. Under high emissions scenarios, future top climate concerns are:

- 2030s: Flooding poses the top concern.
- 2050s: Warmer temperatures make wildfires the biggest threat.
- 2080s: Extreme temperatures and their potential to harm food production, infrastructure, human health, and ecosystems.

## Inequity and Climate Change

The environmental, financial, and social impacts of climate change impact some more than others. Mi'kmaq, Indigenous, Black and African Nova Scotian communities, as well as other equity-seeking groups including persons with disabilities, women, members of the 2SLGBTQ+ community, people of colour and immigrants are vulnerable to systemic inequalities that are amplified by climate change<sup>v</sup>. These groups also possess less coping capacity than Nova Scotia's general population, meaning that it will be more difficult for these groups to respond to climate change threats and respond to any emerging opportunities. Discrimination and racism, substandard infrastructure, lack of resources and supports, and inequitable access to education and job opportunities are only some of the disadvantages faced by equity-seeking groups. Further, each region in Nova Scotia has a unique population mix with unique strengths and weaknesses in responding to climate change.

Our strategies to address climate change mitigation and adaptation must include a shared path to reconciliation and help to remove systemic barriers in all sectors and in all corners of the province. Our solutions should address the root causes of systemic inequities and ensure long-term collective well-being for everyone. Those who are the most impacted by climate change should be central voices in mitigation and adaptation planning. NSCC will build on our strong culture of excellence in equity, diversity, inclusion, accessibility, and anti-racism to embed diverse perspectives in our work on climate change.

NSCC is also well positioned to provide equitable access to education for Nova Scotians and help provide opportunities for everyone to contribute to inclusive economic prosperity and to improve our quality of life. Equity is our collective call to action. Our businesses need diverse, highly skilled and well-trained employees ready to meet the pace of change facing the world. Our Strategic Plan, *Our time is now*, includes a goal of helping Nova Scotians both prepare for climate change-related careers and corresponding sector disruptions, as well as helping our communities respond to emerging climate opportunities and threats.

## Embedding indigenous principles into climate change action

During development and implementation of our climate change action plan, we will seek to centre indigenous principles such as Netukulimk in our ways of thinking.

**Netukulimk is achieving adequate standards of community nutrition and economic well-being without jeopardizing the integrity, diversity, or productivity of our environment<sup>vi</sup>.**

The Mi'kmaq understand that they have an inherent right to access and use our natural resources and they also have a responsibility to use those resources in a sustainable way.

Netukulimk is an essential concept for Mi'kmaw people because it embeds understandings as to how a person should live their life on earth where spirit guides the heart, mind and actions. Netukulimk governs the physical, emotional, cognitional, social and spiritual relationships a person has with everything, including the physical features of the land, the rhythms and cycles and patterns of Wskitqamu (Mother Earth), and all her living beings and nonliving things.

By integrating *Netukulimk* (traditional Mi'kmaq management) with traditional and conventional ways of understanding, known as *Etuaptmumk* (Two-Eyed Seeing), we can begin to come together as one and responsibly co-manage our efforts to mitigate our impact on the environment and restore nature's capacity to support future generations. Everyone at NSCC will have a role to play in making our goals a reality.

Key lessons that will help NSCC integrate Netukulimk into our Climate Change Action Plan include the understanding that words are not enough; that using the language is only the beginning of the journey of understanding the concept of Netukulimk, and that we learn when we listen. NSCC is committed to respecting the cultural knowledge of the Mi'kmaw incorporating First Nations' principles of *Etuaptmumk* and Netukulimk into all aspects of college operations, including our Climate Change Action Plan.

## Understanding Greenhouse Gas Emissions

For effective greenhouse gas (GHG) management, it is useful to recognize the distinction between direct and indirect emissions. Direct emissions are emissions from sources that are owned or controlled by an organization. Indirect emissions are emissions that are a consequence of activities of an organization but occur at sources owned or controlled by another organization. To help differentiate between direct and indirect emission sources, three “Scopes” have been defined for GHG accounting and reporting purposes<sup>vii</sup>:

Scope 1: Direct GHG emissions occurring from sources that are owned by NSCC. Scope 1 emissions sources include: Combustion of fuels to heat our buildings and cook in cafeterias and culinary programs (i.e. fuel oil, natural gas, propane, wood) and combustion of fuels by NSCC owned vehicles. These emissions are calculated using specific emission factors for oil, propane, steam, wood and natural gas and quantified as carbon dioxide (CO<sub>2</sub>) equivalent emissions.

Scope 2: Indirect emissions that are a result of activities that take place within institutional boundaries but occur at sources owned or controlled by another entity. These emission sources include purchased electricity from Nova Scotia Power (NSP) at all our campuses, purchased steam from the Nova Scotia Health Authority (NSHA) for heating at Ivany Campus, as well as district heat at Lunenburg Campus.

Scope 3: Indirect emissions from sources not owned or controlled by NSCC. Examples include upstream emissions from purchased goods and materials, or downstream emissions from employee and student commuting to work or class. Since many of NSCC’s campuses are located in rural locations, student and staff commuting to these locations has the potential to significantly contribute to NSCC’s indirect emissions.

## 2. Vision, Key Themes, And Focus Areas

### Vision

*Overall strategic direction for climate change action at NSCC.*

**Leverage NSCC's leadership in environmental sustainability to serve as a catalyst for the integration of climate change action within the College and our communities.**

### Key Themes

The Plan focuses on three key themes: Mitigation, Adaptation, and Education. Each key theme has specific focus areas that will contribute to the success of the plan.

#### Key theme: Mitigation

*Climate change mitigation* means addressing the cause of climate change by reducing the amount of greenhouse gases released into the atmosphere. Mitigation efforts will be primarily focused on capital planning and operations of physical infrastructure. The crucial component for successful implementation will be integrating climate-focused solutions to existing capital plan goals. A key area for development is a funding mechanism for strategic investment in climate-focused projects to support our long-term goal of net-zero carbon emissions.

#### Key theme: Adaptation

*Climate change adaptation* means acting to reduce risks and take advantage of opportunities from the effects of climate change that we are already experiencing as well as those that we will face in the future. Adaptation efforts will focus on conducting assessments of our climate risks and vulnerabilities and planning responses at an institutional level. Assessment will include coordination with stakeholders responsible for implementation of other college plans and policies, as well as campus management teams. Due to the Sustainability Team's connection to stakeholder groups through both STARS and the UN SDGS, this group is best positioned to conduct this assessment, identify actions, and recommend solutions to ensure NSCC can build capacity anticipate and react to climate threats. As the College builds internal capacity, we can also begin to engage with external stakeholders to increase the climate resilience of our neighbours and communities.

#### Key theme: Education

NSCC was built on a simple but powerful foundation: learning ignites the potential of individuals, industries, and communities. At its best, learning is an act of service, and at NSCC, we are a community of lifelong learners in service to the future of our province. Monumental environmental forces across the globe are reshaping the opportunities and risks facing post-secondary institutions as they steward their future success. These forces include worsening climate change, acceleration to the low carbon economy, and the growing intersection between social equality and environmental sustainability. NSCC is committed to helping Nova Scotians both prepare for climate change-related careers and corresponding sector disruptions, as well as helping our communities respond to emerging climate opportunities and threats. Climate adaptation and mitigation research, planning outreach and strategy should take into consideration co-benefits of solutions which can support adaptation, mitigation and climate resilience.



## Focus Areas

Focus areas break down our key themes into smaller topics that will support our long-term vision and goals for our Climate Change Action Plan.

### Focus Areas: Mitigation

#### *Improving energy efficiency in existing buildings.*

NSCC has been working towards its ambitious climate goals for over fifteen years. In that time, we have replaced our lighting systems with LEDs and converted aging fuel-oil boilers to modern, high-efficiency propane or natural gas units – for example. The next stage of our climate change journey will be more complex as we embark on Deep Energy Retrofits and recommissioning – projects that integrate multiple building systems and require whole-building analysis of the interaction between HVAC, electrical, building envelope and automation systems. It is critical that NSCC implement an integrated energy management plan that aligns our capital planning process with a phased pathway to our 2030, 2040 and 2050 emissions reduction goals. Creating this plan will allow NSCC Facilities and Engineering to begin costing scenarios and assign annual budgets to reach our goals.

#### *Increasing renewable energy production.*

Installing on-site renewables will be a critical part of our organization's efforts to achieve net-zero operations. We must utilize all available space to our advantage. NSCC currently has four operational solar panel installations at Ivany, Strait Area, Shelburne, and Annapolis Valley Campuses, which produce 264kW of renewable energy for Nova Scotia's electrical grid.

#### *Transitioning our fuel sources.*

NSCC's heating fuel mix contains carbon-intensive fossil fuels such as heating oil, propane, and natural gas. NSCC will transition away from these traditional fuel sources and electrify our buildings, so that we can use renewable wind, solar and hydroelectric energy sources as they become more accessible in Nova Scotia.

#### *Setting high standards for new construction.*

We can no longer afford to ignore the lifecycle emissions of our new buildings. Buildings constructed in 2023 will most certainly still be in operation in 2050. Thus, we must incorporate long-term climate goals into the design of our new construction projects now.

#### *Developing supports for alternative transportation.*

Alternative transportation methods have been identified as a key area of vulnerability for NSCC after conducting a commute modal split survey in 2019. An encouraging sign was that almost one quarter of NSCC students responded that they use public transit. In the Halifax Regional Municipality, full-time NSCC students can apply for the U-Pass program, which allows students to use conventional, ferry, and Access-A-Bus services.

However, public transit options do not exist in the communities where many of our campuses are located. The survey also indicated over half of NSCC students and over 80% of NSCC employees commute alone to NSCC each day. Just over 10% of our students rideshare. Many of our campuses are located in rural areas and face a similar challenge to many Canadian communities in lack of support for sustainable transportation options. NSCC must do our part to increase support for these options, to empower our students and staff to make more sustainable choices.

### *Expanding our electric vehicle charging network.*

NSCC is uniquely positioned to help facilitate an expanded EV charging network across Nova Scotia. Many of our campuses are in rural communities. Survey data shows that over 50% of our students commute solo in cars without passengers. The College can play an important part in the establishment of a reliable network of EV chargers that will service the College community as well as many rural communities. Our plans include EV charging infrastructure at all our campuses that will serve both NSCC's fleet, staff, students and the general public. Currently, NSCC operates 14 electric vehicle charging stations at six campuses, and our goal is to continually expand our charging network on an annual basis, creating a network of 13 sites with EV support infrastructure that gradually expands in volume over time as more Nova Scotians adopt electric vehicles. NSCC is proud to host the first bi-directional DC fast-charger in the Maritimes at Annapolis Valley Campus – Middleton and will look for new opportunities to install more bi-directional chargers moving forward.

### *Greening our fleet.*

NSCC has over 50 vehicles in our fleet. They range from compact cars to full size trucks and delivery vans. We see our fleet emissions as a major opportunity for improvement going forward. NSCC will review our campus fleet and develop a schedule for replacing fleet vehicles with electric vehicles.

## **Focus Areas: Adaptation**

### *Improving resiliency.*

In a future where storms increase both in frequency and severity, our buildings must be resilient during short or prolonged storm events and flooding. We will see a decreased need for heating in the winter, but an increased need for cooling year-round. Our communities may experience drought conditions, heat waves and cold snaps. The College can and will play an important role in protecting Nova Scotians from the most severe impacts of climate change. Our campuses have the potential to play an important role in reducing the impacts of climate events on our surrounding communities, particularly in rural areas and low-income communities. We will first focus on reviewing our existing infrastructure to determine which assets are at most at risk and outlining nature-based solutions to climate impacts.

### *Nature-based solutions.*

Natural ecosystems will play an important role in climate change resiliency. Natural landscaping features can reduce the impact of the heat island effect and flooding due to storm events. Green spaces and natural landscaping techniques can increase biodiversity and support native, adaptive and edible plant species. By creating more green spaces on our Campuses, we will help our sites adapt to climate change while also providing healthier and more inviting public spaces for our staff, students, and community to utilize and learn from.

Low-Impact Development (LID) refers to systems that work with nature to manage stormwater as close to its source as possible. LID methods include preserving or recreating natural landscape features, minimizing impermeable hardscapes, and treating stormwater like a resource instead of a waste product. By implementing LID practices such as bioswales, rain gardens, green roofs, and permeable pavers. NSCC can promote the natural movement of stormwater and promotes natural biodiversity on our Campuses by integrating LID and naturalization practices into existing site features.

### *Expanding green spaces.*

Outdoor spaces in which to rest and reflect at work or school can positively impact mental health and well-being. Several NSCC Campuses already include outdoor spaces that are accessible to the public at their leisure. Native trees and plants are one of the low-cost and low-maintenance strategies for carbon sequestration, reduction of the heat island effect, and stormwater management. Increasing canopy cover will help us achieve both our climate change mitigation and adaptation goals. It is also imperative we protect existing biomass on our properties.

## **Focus areas: Education**

### *Teaching for the future.*

We know that combatting climate change creates opportunities for jobs and new industries, and to help foster this growth NSCC must amplify our environmental efforts and further align our programming and research to this growing imperative. The College will help Nova Scotians both prepare for climate change-related careers and corresponding sector disruptions, as well as helping our communities respond to emerging climate opportunities and threats.

### *Engagement and awareness.*

The NSCC Sustainability Team has also identified engagement and awareness as a key area for development in relation to all UN SDGs, and these efforts should also support education efforts on climate change action. The College can influence both individual and collective action on climate in Nova Scotia through both on-campus and public engagement campaigns focused on education on the impacts of climate change and the steps Nova Scotians can take to address them. Our plan is to extend existing engagement efforts on SDG awareness to specific, climate-related topics with students, staff, and external stakeholders.

### *Providing supports for our communities.*

Our role must also extend beyond our proverbial four walls, seeking opportunities to provide leadership, support, and resources throughout our communities to allow for greater, more collective efforts to address climate change. We must help our communities respond to emerging climate opportunities and threats.

### *Educating on green buildings.*

Cultivating environmental knowledge and sustainable building practices is a responsibility we all share. NSCC's educational model and facilities serve as catalysts for change in Nova Scotia and beyond. The open and collaborative approach that we offer at our campuses will extend to other initiatives and into the broader community. Using our campus infrastructure as a learning tool will enhance our learning environments and facilitate innovation in climate change mitigation and adaptation, empowering our students and changing the workforce of today and tomorrow. Examples of green building education at NSCC campuses include the Centre for the Built Environment (CBE) at Iwany Campus, Pilikan House at our Annapolis Valley Campus, and the Dr. Jon Hamm Trades and Innovation Centre at Pictou Campus.

## 3. Climate Change Action Plan

### 2050 GOALS

Long-term goals setting specific directions for each key theme in the climate change action plan.

**Mitigation:** Achieve net-zero emissions by 2050.

**Adaptation:** Reduce negative climate change impacts while maximizing positive benefits for people, businesses, and the environment.

**Education:** Improve education, awareness, and capacity on climate change action in Nova Scotia.

### 2030 Milestones

Medium-term milestones to keep us on track towards our long-term goals and the United Nations Sustainable Development 2030 Goal 13 for Climate Action.

#### Mitigation

- Reduce GHG emissions 60% from 2009 baseline.
- Generate 1MW of renewable energy at NSCC campuses.
- Increase the availability of active transportation options for NSCC staff and students.
- 30% of NSCC Fleet Vehicles are fully electric.

#### Adaptation:

- Increase overall college resiliency to climate change impacts.
- Increase the capacity of NSCC campuses to manage rainwater onsite.
- Increase the use of green infrastructure solutions on NSCC campuses.

#### Education:

- Raise awareness of climate risks and adaptation priorities across Nova Scotia.
- Integrate Climate Change into academic programming.
- Increase the number of *campus as a living lab* opportunities on NSCC campuses.

### Near-Term Objectives

Key priorities for action within the next five years.

#### Mitigation:

- Draft an Integrated Energy Management Plan to deliver on GHG targets and transition away from fossil fuels.
- Implement Sustainable Building Standards, which will outline requirements for sustainable design and construction in NSCC Capital Projects.
- Report on options for sustainable carbon offsetting programs.
- Embed life-cycle assessment principles in procurement decisions to drive adoption of clean technologies and green products and services.
- Install electric vehicle charging stations at every NSCC Campus.

- Create NSCC fleet decarbonization plan.

#### Adaptation:

- Complete climate resiliency plans for all NSCC campuses.
- Develop backup power systems for critical support infrastructure to avoid interruption to college services.
- Integrate climate change resiliency into the design, construction, and operation aspects of capital planning.

#### Education:

- Provide staff training and support related to assessing climate change impacts, undertaking climate change risk assessments, developing adaptation actions, and facilitating sharing of best practices and lessons learned.
- Create green building learning opportunities in all new construction projects.
- Establish a Climate Change Working Group to facilitate sharing of best practices and lessons learned.

## ACTIONS

Immediate steps towards our objectives, to be taken right away or over the next 2-3 years.

#### Mitigation:

- Complete installation of 75kW of rooftop solar panels at Lunenburg Campus in 2023.
- Install 300kW of rooftop solar panels at the Downtown Sydney Campus by 2026.
- Install 14 electric vehicle charging stations in 2023.
- Install 11 electric vehicle charging stations in 2024.
- Install 5 electric vehicle charging stations in 2025.
- Enroll in the Green Choice Program, which will allow participants to purchase 100 percent renewable electricity for our operations as it becomes available.
- Commit to no new oil-fired heating equipment in new or existing buildings.
- Complete feasibility study on renewable energy generation potential at all NSCC campuses

#### Adaptation:

- Develop a framework for campus climate resiliency assessments.
- Mandate use of low-impact development and green infrastructure strategies in new construction.
- Create a strategy to expand green space and enhance biodiversity at NSCC campuses.
- Implement a biomass retention program that requires replacement of any disturbed trees or other vegetation with biomass equal in volume to what was removed.

## Education:

- Develop a Climate Literacy Micro-credential for construction trades.
- Raise awareness of climate risks and adaptation priorities across Nova Scotia through public education and engagement.
- Report on NSCC's GHG emissions inventory during our 2023, 2026, and 2029 AASHE STARS Submissions.
- Provide annual updates on Climate Change Action Plan progress in NSCC's Annual Sustainability Report.
- Provide energy usage, renewable energy production, and emissions data for all NSCC Campuses in NSCC's Annual Sustainability Report
- Develop partnerships to fill knowledge gaps on the severity of climate risks and their impact on Nova Scotian communities and advance shared climate goals.

## 4. NSCC's Emissions Inventory, Benchmarking and Reporting

NSCC's baseline for greenhouse gas (GHG) emissions reporting is the 2008-2009 academic year. Reporting follows the GHG Protocol Corporate Accounting and Reporting Standard. Our GHG inventory covers College owned and operated facilities spread across Nova Scotia. Although not required to meet regulatory targets for Scope 1 and 2 emissions, NSCC tracks and reports on Scope 1 and 2 emissions in our Annual Sustainability Report. We also track some Scope 3 emissions for reporting to AASHE's STARS program, as well as for action planning purposes. Scope 3 emissions calculations are currently limited due to a lack of reliable data for many upstream and downstream emissions, but NSCC plans to expand scope 3 reporting as more data becomes available. Scope 3 emissions are not available for our 2008-2009 baseline year.

NSCC tracks energy consumption and GHG emissions for our Campuses in Energy Star Portfolio Manager (ESPM). This platform is hosted by the US EPA and allows building owners to track energy consumption and GHG emissions across a portfolio of buildings in a secure online environment. This platform allows NSCC to track and measure GHG emissions reduction performance in a more accurate and transparent manner. Scope 1 emission factors are applied at a national level for Canada, and natural gas emission factors are applied by Province. Scope 2 emission factors for electricity are obtained from *Canada's National Inventory Report – Greenhouse Gas Sources and Sinks in Canada* and are applied at a Provincial level. An added benefit is that ESPM is continually updated by the EPA as new industry data is obtained, so NSCC can be sure that our GHG emissions estimates are accurate. Scope 3 emissions are not tracked through ESPM – they are calculated based on established methodologies which are completed by NSCC Facilities and Engineering staff.

Since 2009, NSCC has published an annual sustainability report that tracks the progress we have made in reducing our energy and water consumption, as well as reducing our waste generation and greenhouse gas emissions. In 2020, the annual report was expanded and aligned with the SDGs to make clear connections between our existing goals in academics, operations, engagement, and administration with global goals for sustainable development.

In addition, NSCC has been certified by the Sustainability Tracking, Assessment and Rating System (STARS) from the Association for the Advancement of Sustainability in Higher Education (AASHE) with a Gold rating since 2013, and most recently recertified in 2020. The recertification period for STARS is every three years, and evaluation includes sustainability efforts across the entire College, including academics and research, planning and administration, operations, and engagement. Our climate change mitigation and adaptation strategies are part of this evaluation.

Finally, by signing the SDG Accord NSCC has committed to annual reporting on progress made towards the United Nations 2030 targets for all 17 Sustainable Development goals. Each year we will evaluate our efforts to support the SDGs related to climate change action on an institutional level and submit a progress report to the United Nations, along with case studies of notable projects or efforts from the past year.

As we strive to meet our goals, NSCC's progress on Climate Change Action will be tracked and reported both internally and to the public through these three reporting mechanisms. Our reporting process will provide important learning opportunities for both internal staff and our communities, as we grow and improve our sustainability performance in a transparent manner.

**Table 1: Summary of NSCC's 2008/2009 GHG Emissions Baseline**

<b>Emissions Scope</b>	<b>Baseline Year Emissions (Metric Tonnes CO2e)</b>
Scope 1: Stationary Combustion, Fleet Vehicles	8,771
Scope 2: Purchased Electricity, District Heat	22,167
<b>Total Scope 1 and 2 Emissions</b>	<b>30,937</b>

**Table 2: NSCC GHG Reduction Targets**

<b>Year</b>	<b>GHG Emissions Reduction Target</b>	<b>Annual GHG Emissions (Scopes 1 and 2)</b>
2030	60% Reduction from baseline	12,375
2040	80% Reduction from baseline	6,188
2050	100% Reduction from baseline	0

### NSCC's Emissions Inventory

NSCC's baseline year for gross Scope 1 and 2 emissions is the 2008/2009 Academic Year (September 2008-August 2009), the year in which we began to track this data across our building portfolio. During our 2009 baseline year for emissions data, we emitted 30,938 tonnes of CO2e (carbon dioxide equivalent). Our GHG inventory is based on the GHG Protocol Corporate Accounting and Reporting Standard.

Compared to our baseline year, the College has reduced our annual Scope 1 and 2 emissions by approximately 40%. This is due to a combination of factors, including major renovation projects at all campuses, increasing the efficiency of our building systems, switching away from fossil fuels, and increasing insulation of our buildings to reduce energy waste. Our 2030, 2040 and 2050 reduction targets for GHG reduction are based on maintaining this pace of GHG emissions reductions over the next 20 years.

NSCC also tracks our Scope 3 emissions from commuting, rental vehicles, and business travel, and reports them in our GHG inventory for educational and climate planning purposes. We do not have a baseline for scope 3 emissions, because our reporting methodology has changed substantially as we refine our data collection and emission factors over time. However, we acknowledge that due to the geographic spread of our campuses and the lack of accessible public transportation in much of Nova Scotia, scope 3 emissions are a main concern for NSCC's climate plan moving forward, and we are actively working on new solutions to support sustainable transportation options to our staff and students.

### Scope 1 Emissions

Direct emissions occurring from sources that are owned or controlled by NSCC.

**Stationary Combustion Fuels:** Most NSCC Campuses are heated by central heating plants with boilers. Due to the age of our building portfolio, many of our Campuses were at one time burning #2 fuel oil, but



over the last ten years, the College has been undergoing a process of fuel-switching at our sites when feasible.

Direct emissions monitoring is not a standard method of practice at NSCC due to the number of buildings in our portfolio. Instead, monthly invoices are used to determine quantities of fuel consumed. Fuel meters are created in ESPM for each fuel type used at a Campus. Portfolio Manager then converts all site energy consumption into MBtu (thousand British Thermal Units), converting volume units from our invoices to energy using standard heat content factors that are specific to Canada (natural gas has thermal content and emission factors specific to Nova Scotia).

Akerley, Kingstec, Lunenburg, Marconi, Pictou and Strait Area Campuses all host culinary programs and use propane and natural gas as fuel sources for cooking activities. Due to the nature of our operations, many of our Campuses contain cafeterias that are operated by various independent food service providers. NSCC owns the infrastructure that supports these operations and in addition the kitchens sometimes share fuel sources with the rest of the campus, making it difficult to separate the associated usages. As a result, we categorize all propane or natural gas used on Campus as Scope 1 emissions. In a similar fashion to stationary combustion fuels, cooking fuels are tracked using independent fuel meters on the ESPM platform.

**Mobile Emissions (Fleet Vehicles):** The NSCC fleet consists of vehicles owned by the College that operate within and between our various sites across the province. Mileage log sheets are kept in each vehicle and are used to estimate associated emissions. Fleet vehicle make and model information is used in combination with Natural Resources Canada's *Fuel Consumption Ratings Search Tool* and the US EPA's *Emission Factors for Greenhouse Gas Inventories (Table 3)* to obtain emissions data for each vehicle. Emissions for CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O are multiplied by the appropriate CO<sub>2</sub>e factors and summed to determine one total CO<sub>2</sub>e figure for fleet vehicle emissions. For vehicles that did not have associated mileage data for 2018-2019, assumptions for mileage were used based on conversations with facilities staff and proxy data from other similar vehicles in the fleet.

## Scope 2 Emissions

Indirect emissions occurring from the consumption of purchased electricity, heat or steam.

**Electricity:** Electricity is provided to NSCC Campuses by our provincial electrical grid, which is operated by Nova Scotia Power Incorporated (NSPI). Typically, each Campus has a main line fed into a central mechanical room that measures all electricity consumed in the base building. Recent expansions at several campuses contain secondary NSPI meters to measure consumption specific to the additional spaces. Various outbuildings and houses on NSCC property have separate metered connections to the NSP grid. For ease of tracking and reporting, all NSPI accounts from each Campus are added together before entry into the ESPM platform, and the separate invoice amounts are kept on file by NSCC Facilities for reference.

**District Heat:** NSCC Ivany Campus receives monthly invoices from the Nova Scotia Health Authority (NSHA) for district steam purchased from Dartmouth General Hospital, as read off a condensate meter at the hospital. NSCC Lunenburg purchases district heat produced via biomass from a neighbouring provincial courthouse, and receives monthly invoices.

The respective energy sources are then multiplied by a single emission factor that incorporates the respective contributions of CO<sub>2</sub>, CH<sub>4</sub>, and N<sub>2</sub>O. These factors are provided on a national level for district

steam and biomass, and a provincial level for electricity. The Nova Scotia emission factor for electricity is taken from Canada’s *National Inventory Report* which is submitted by Canada to the United Nations’ *Framework Convention on Climate Change*.

### Scope 3 Emissions

Other indirect emissions from activities that occur upstream and downstream of a company’s immediate activities.

**Commuting:** Commuting emissions are generated by NSCC employees and students as they travel to and from our campuses. Emissions estimates are generated as a result of survey data collected by NSCC’s institutional research department. In two separate surveys conducted in fiscal year 2019/2020, staff and students were asked the same set of questions about the distance of their commute and their method of travel. From these data sets, we gained reasonable estimates of commuters’ habits (driving alone, carpooling, bicycling, walking, and public transit), as well as estimates of the relative distance of their commutes to the College. For each method of transportation with associated emissions (driving alone, carpooling, public transit), commute distance was multiplied by associated emission factors taken from the US EPA’s *Emission Factors for Greenhouse Gas Inventories* to quantify emissions from each source.

**Rental Vehicles:** Emissions estimates for NSCC’s rental vehicles were provided by Enterprise Rent-A-Car, the College’s rental vehicle vendor. Enterprise uses a central database to track all vehicles used by NSCC employees across the province, including vehicle class and mileage. They then apply industry standard US EPA emission factors for each vehicle class to determine the annual impact of NSCC’s rentals.

**Business Travel:** A mileage analysis report is created annually from the NSCC online expense claims system, which employees use to report their travel expenses. This provides an accurate accounting of the emissions associated with travel in personal vehicles for business purposes.

### Key Performance Indicators

Due to the ever-evolving demands on our buildings that are associated with academic programming changes as well as additional services offered by the college over time, several Key Performance Indicators (KPIs) will be monitored to gauge the overall effectiveness of the CCAP. These KPIs will be reviewed annually to determine how effectively NSCC uses space and energy, as well as demonstrating the return on investment for funding spent on carbon mitigation efforts across the province.

Key Performance Indicators
FTEs
Gross Area
Total Energy Use
Weather-Normalized Energy Usage Intensity
GHG Emissions – Absolute (Scopes 1 and 2)
GHG Emissions – Per Square foot
GHG Emissions – Per FTE
GHG Emissions – Per Gigajoule of energy use
Renewable energy produced

## 5. Foundations for Effective Implementation

Climate change is an incredibly complex challenge that needs to be addressed through several avenues. This kind of action is time- and resource-intensive. To effectively implement the plan, significant financial investments into human resources and project funding will be required. With investment into the implementation of the Climate Change Action Plan, the College can keep on track to increase resilience and minimize vulnerabilities while aligning with its strategic and sustainability goals. De-carbonizing our operations and preparing for climate threats will help the College reduce the future cost of reacting to emerging climate change-related issues. The COVID-19 pandemic is a recent example of how a modest investment in coordination and planning can mitigate larger-scale reactive solutions that are less efficient and disrupt business continuity.

The Climate Change Action Plan was developed - in part - through consultation with many stakeholders from across the College. The result is a plan that creates goals and supporting actions for College operations, campus master planning, and Academics, all while applying additional lenses of equity and indigenous principles like Netukulimk; a complex Mi'kmaq cultural concept that guides individual and collective beliefs and behaviors in resource protection, procurement, and management to ensure and honour sustainability and prosperity for the ancestor, present and future generations.

What became clear during the process was that everyone at NSCC will have a role to play in making our goals a reality. The executive will provide guidance and leadership, College Departments will embed the key themes of the plan into existing plans and strategies, and individuals will be empowered to act in their roles by making choices that support our shared goals.

### Executive Sponsor(s)

Provide senior-level guidance and functional leadership to embed the Climate Change Action Plan goals into education, research, leadership, operations, administration, and engagement activities across the College.

### College Departments

Embed key themes of climate change adaptation, mitigation and education in projects supporting both NSCC's current Strategic Plan and Climate Change Action Plan by embedding climate change action into their existing unit-level plans, detailing their contributions to these strategies.

### Climate Change Working Group

In order to achieve the level of cohesiveness needed to advance our climate agenda in such a diverse, fast-moving organization, we will require a mechanism to effectively communicate with various College units; to provide updates, receive feedback, workshop ideas, and to create partnerships that contribute to the goals of the plan. Our initial thought is to create a "working group", a network of colleagues who provide a diverse perspective on the College's Strategic Enablers and Priority Areas of Impact, as they relate to climate action.

A Climate Change Working Group will be established to advance and monitor progress towards NSCC's climate change goals regarding mitigation, adaptation, and education. The Working Group will include members from the College's SDG Steering Committee, as well as ex-officio members within NSCC who will act as key advisors and champions of climate change action within the College's existing organizational

structure. This working group will act as a sounding board, a repository for information, and a pathway for communication to advance the key themes of the Climate Change Action Plan.

### Individuals

Individual action is essential to addressing climate change. Members of the NSCC community can participate in the Climate Change Action Plan by making personal choices at home and work that support our shared goals. Action areas include energy use, consumption of goods, commuting methods, and food choices all have a cumulative impact on an individual's carbon footprint. NSCC will strive to provide institutional supports to empower our staff, students, and faculty to make choices that reduce our carbon emissions.

## 6. References

<sup>1</sup> Province of Nova Scotia (2022). Our Climate, Our Future - Nova Scotia's Climate Change Plan for Clean Growth. Retrieved from: <https://climatechange.novascotia.ca/sites/default/files/uploads/ns-climate-change-plan.pdf>

<sup>2</sup> Intergovernmental Panel on Climate Change (IPCC), 2022: Summary for Policymakers [H.-O. Pörtner, D.C. Roberts, E.S. Poloczanska, K. Mintenbeck, M. Tignor, A. Alegría, M. Craig, S. Langsdorf, S. Lössche, V. Möller, A. Okem (eds.)]. In: Climate Change 2022: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [H.-O. Pörtner, D.C. Roberts, M. Tignor, E.S. Poloczanska, K. Mintenbeck, A. Alegría, M. Craig, S. Langsdorf, S. Lössche, V. Möller, A. Okem, B. Rama (eds.)]. Cambridge University Press, Cambridge, UK and New York, NY, USA, pp. 3–33, doi:10.1017/9781009325844.0

<sup>3</sup> Province of Nova Scotia (2022). Weathering What's Ahead: Climate Change Risk and Nova Scotia's Well-Being. Retrieved from: <https://climatechange.novascotia.ca/sites/default/files/uploads/climate-change-risk-report.pdf>

<sup>4</sup> Ibid.

<sup>5</sup> Unama'ki Institute of Natural Resources (2020). *Netukulimk*. Retrieved from UNIR's website. <https://www.uinr.ca/programs/netukulimk/>

<sup>6</sup> World Resources Institute and World Business Council for Sustainable Development (2004). The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition). <http://www.ghgprotocol.org/files/ghgp/public/ghg-protocol-revised.pdf>

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