



Climate Change

Progress Report October 2019



Contents

Message from the Minister.....	2
Highlights.....	3
I. WHY WE MUST ACT.....	4
Why climate change matters in Nova Scotia.....	4
Nova Scotia's greenhouse gas emissions.....	5
II. OUR PROGRESS.....	7
Cap and trade program.....	7
Green Fund.....	8
Reducing emissions from the electricity sector.....	8
Clean, renewable energy.....	9
Energy efficiency for homes, businesses, and communities.....	10
Clean transportation.....	12
Protecting our coastline, waterways, and land.....	13
Building capacity to adapt.....	14
Education on climate change.....	14
Climate data, impacts, and risks.....	15
III. LOOKING AHEAD.....	15

Message from the Minister

Climate change is one of the most pressing issues of our time. It is a global emergency that demands urgent action from all of us to avoid the worst of its impacts. It demands more resiliency in our people and our communities to adapt to its effects.

Nova Scotia is a national leader in fighting climate change. We have made tremendous progress to reduce our greenhouse gas emissions. We have one of the most aggressive targets in the country to lower them further by 2030.

We are also taking steps to adapt. For example, we are the only province with legislation specifically to protect our coasts. The Coastal Protection Act will protect coastal ecosystems and ensure new construction is safe from sea level rise and coastal erosion.

In this report, we outline these and other key actions that we and our partners are taking to address climate change in Nova Scotia. While there is more work to do, Nova Scotians should be proud of the progress we have made to date.

Gordon Wilson
Minister of Environment

HIGHLIGHTS

Key achievements:

- Surpassed federal 2030 target for reducing greenhouse gas emissions 13 years early
- Set one of the most ambitious targets in the country for reducing greenhouse gas emissions by 2030
- Electricity generation from coal down from 76% in 2007 to 52% in 2018
- Clean electricity generation tripled in the last decade
- On track to meet 40% renewable energy for electricity by 2020
- Cap and trade system started in 2019
- Green Fund will offer about \$27 to \$32 million per year for climate change initiatives
- Energy efficiency programs prevent one million tonnes of greenhouse gases each year
- 1400 jobs in the energy efficiency sector are helping build the green economy
- Coastal Protection Act established to legally protect our coasts

Recent investments:

- \$22 million federal-provincial investment in energy efficiency upgrades for 100 public housing units in 51 communities
- \$14 million federal-provincial investment in first four years of 10-year project for energy efficiency upgrades for all homes in Mi'kmaw communities
- \$25 million federal-provincial-municipal investment in 30 km of bike infrastructure in Halifax
- \$114 million federal-provincial investment to restore 60 km of dykes and five aboiteaux
- Working with the federal government to provide their facilities with access to 100% renewable electricity by 2025
- \$18 million Federation of Canadian Municipalities investment in urban climate centre in Halifax
- \$56 million from federal Low Carbon Economy Fund invested in energy efficiency and solar programs for homes, businesses, and communities



Coastal erosion damage at Queensland Beach following a blizzard in January 2018.

I. WHY WE MUST ACT

Why climate change matters in Nova Scotia

Our reality in 2019 is undeniable: climate change is happening now. Nova Scotia is experiencing shifts in rain and snow patterns, milder winters, and prolonged summer heat waves. Our oceans are also changing with rising sea levels and changing acidity and salinity.

These shifts have deep implications for Nova Scotia's ecosystems, infrastructure, and key economic sectors such as agriculture, fisheries, forestry, and tourism. For example, lobster are moving north, we are seeing more coastal erosion and storm surges, and there are more reported cases of Lyme disease, which suggests the tick population is growing.

In September 2018, the Intergovernmental Panel on Climate Change report estimated that human activities have caused our global climate to become about 1°C warmer than pre-industrial levels. It warned of the irreversible impacts of exceeding a global average warming of 1.5°C¹.

Recent federal research confirmed that Canada is warming at twice the global rate. Our country is on a trajectory that, depending on our course of action, could see between 2°C and 6°C of warming by the end of the century². Warming to this level would have serious cascading effects on communities, ecosystems, biodiversity, food production, and industries in Nova Scotia and across the country.

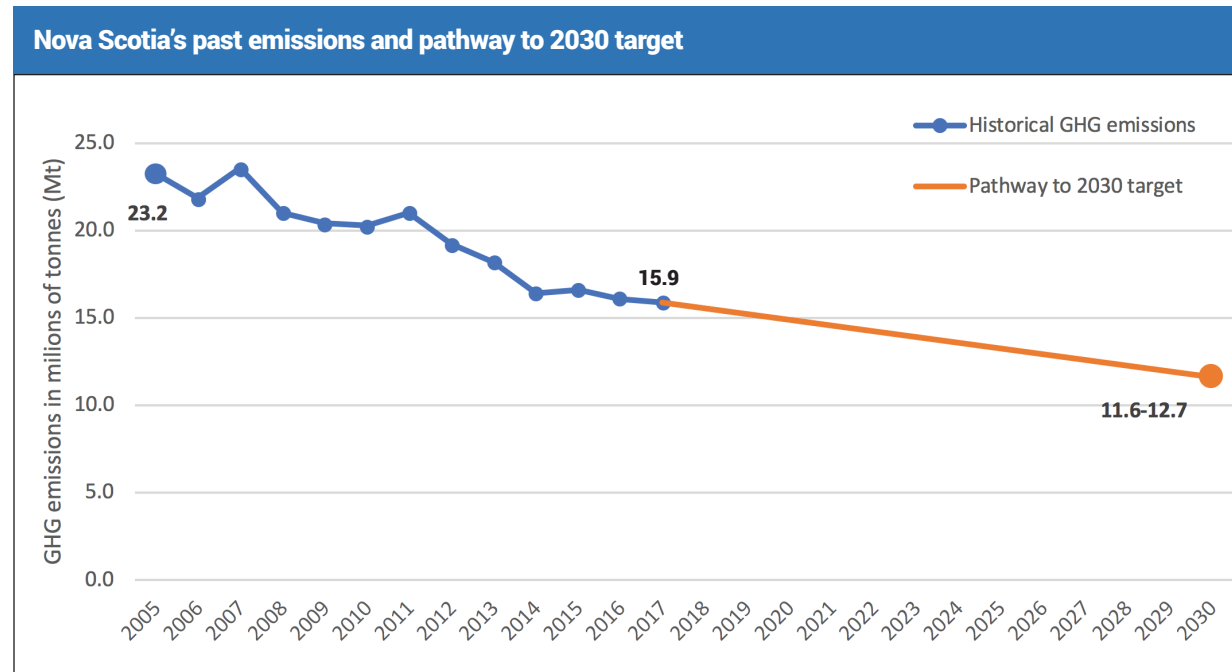
These are serious challenges and we are taking serious action to address them. Governments, businesses, and individual Nova Scotians all have important roles to play to change how we live and build climate resiliency into everything that we do.

¹https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Hheadline-statements.pdf

²<https://www.nrcan.gc.ca/climate-change/impacts-adaptations/canada-changing-climate/19918>

Nova Scotia's greenhouse gas emissions

In 2017, Nova Scotia surpassed the federal greenhouse gas reduction target for 2030. We recognize that more action is still needed. That's why we set a new 2030 goal to reduce greenhouse gas emissions by 45% to 50% below 2005 levels.



Sources: National Inventory Report 2019: Greenhouse Gas Sources and Sinks in Canada, and Nova Scotia Environment, 2019.

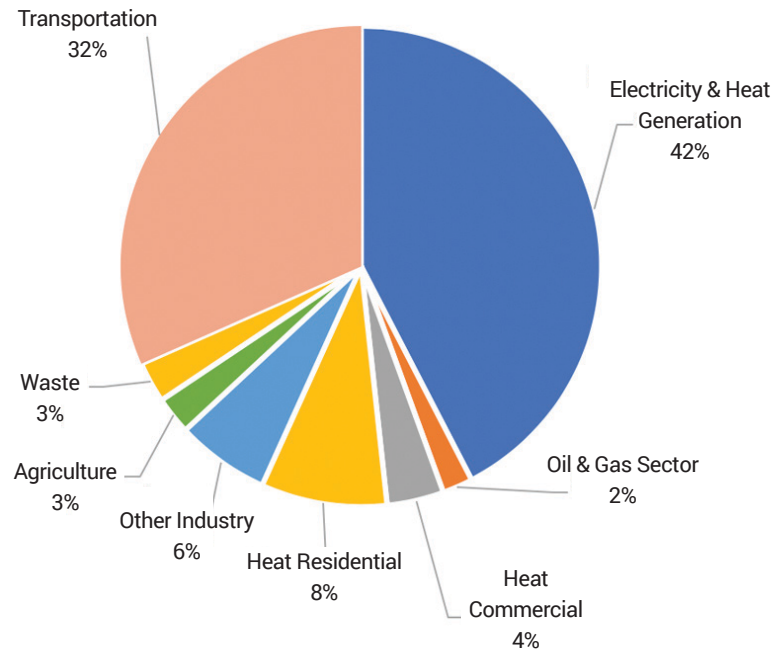
Greenhouse gases

Greenhouse gas emissions are measured as equivalent tonnes of carbon dioxide (CO₂e). In 2017, Nova Scotia emitted 15.86 million tonnes of CO₂e. That's about 16.6 tonnes per person.

Most of Nova Scotia's greenhouse gas emissions come from using coal and other fossil fuels to generate electricity. This contributes to climate change, compromises our air quality, and makes us vulnerable to volatile world prices and supply.

In 2007, 76% of our electricity came from coal. This was reduced to 52% in 2018 by increasing energy efficiency, legislating caps on emissions from the electricity sector, and adding wind, solar, and other clean energy sources to the grid.

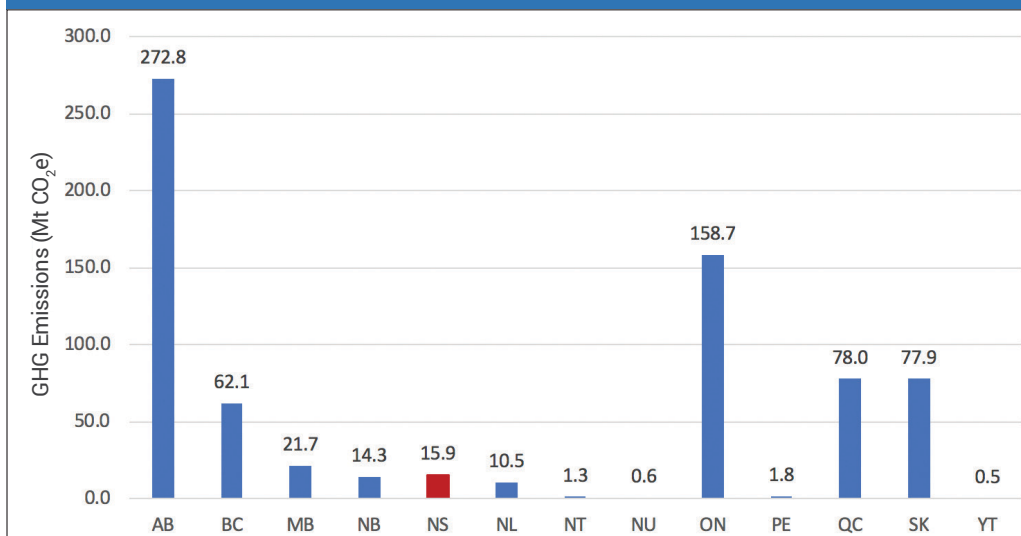
Nova Scotia greenhouse gas emissions by sector (2017)



Sources: National Inventory Report 2019: Greenhouse Gas Sources and Sinks in Canada, and Nova Scotia Environment, 2019.

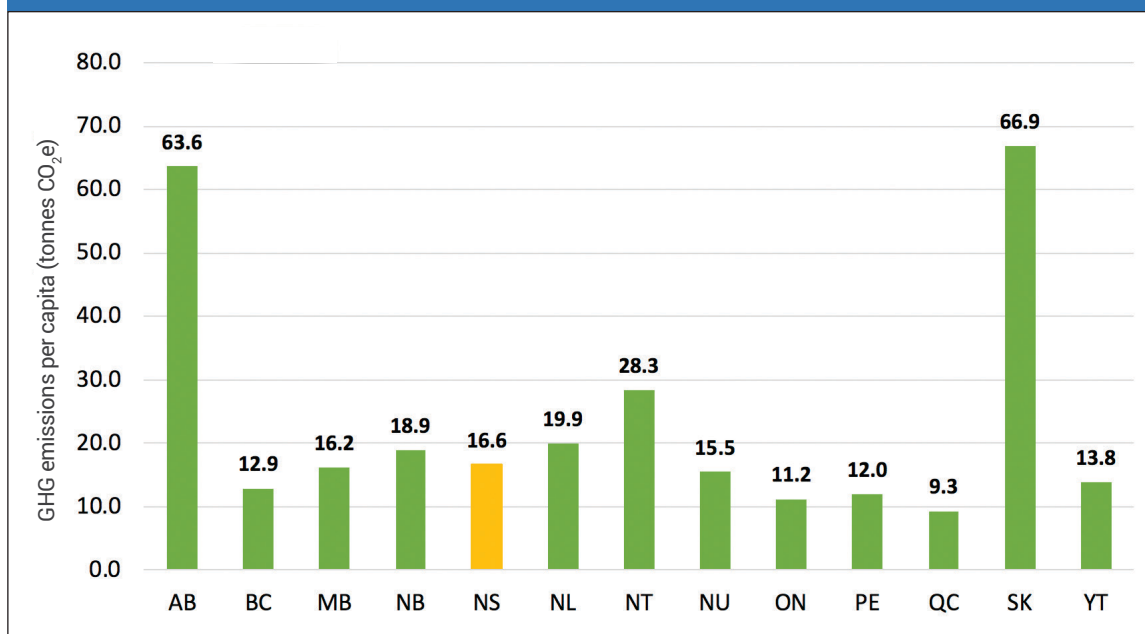
Nova Scotia's total greenhouse gas emissions are small compared to other Canadian jurisdictions, but relatively high on a per capita basis. Jurisdictions with larger populations, bigger economies, significant oil and gas industry, and/or coal-fired electricity systems tend to have higher greenhouse gas emissions. Jurisdictions with more non-emitting electricity generation, such as hydro power, tend to have smaller carbon footprints.

Total greenhouse gas emissions in Canada (2017)



Sources: National Inventory Report 2019: Greenhouse Gas Sources and Sinks in Canada, and Nova Scotia Environment, 2019.

Gas emissions in Canada (2017)



Sources: National Inventory Report 2019: Greenhouse Gas Sources and Sinks in Canada, and Nova Scotia Environment, 2019. Statistics Canada. Annual Demographic Estimates: Canada, Provinces and Territories 2017.

II. OUR PROGRESS

Cap and trade program

Carbon pricing is a way to make polluters pay for their greenhouse gas emissions. It better reflects the true cost of pollution and creates more incentive for industry and consumers to reduce their carbon footprint.

In December 2016, Nova Scotia committed to putting a price on carbon by endorsing the Pan-Canadian Framework on Clean Growth and Climate Change. We consulted with Nova Scotians the following spring on how to design a cap and trade program that would work best for our province. Regulations were released in 2018 and the program began January 1, 2019.

The program sets annual limits or “caps” on the total amount of greenhouse gas emissions allowed from certain activities in the province. The caps cover more than 80% of all greenhouse gas emissions in the province including emissions from electricity production and importation, the supply of fossil fuels, and industrial activities that exceed a certain greenhouse gas threshold. The caps decline each year from 2019 to 2022.

The province creates a total number of emission allowances each year equivalent to the annual cap. Each allowance represents 1 tonne of CO₂e. Most of these emission allowances are distributed free of charge to mandatory program participants. The remaining allowances are sold through government auctions or sales from the government reserve.

Government auctions will start in 2020. The minimum price per emission allowance will be \$20 for auctions held in 2020. Each subsequent year, the minimum price will increase by 5% plus inflation.

Mandatory participants and minimum thresholds for participation

Electricity Importers	Industrial Facilities	Natural Gas Distributors	Petroleum Product Suppliers
10,000 tonnes of CO ₂ e or more	50,000 tonnes of CO ₂ e or more	10,000 tonnes of CO ₂ e or more	200 litres or more of fuel first placed on the market

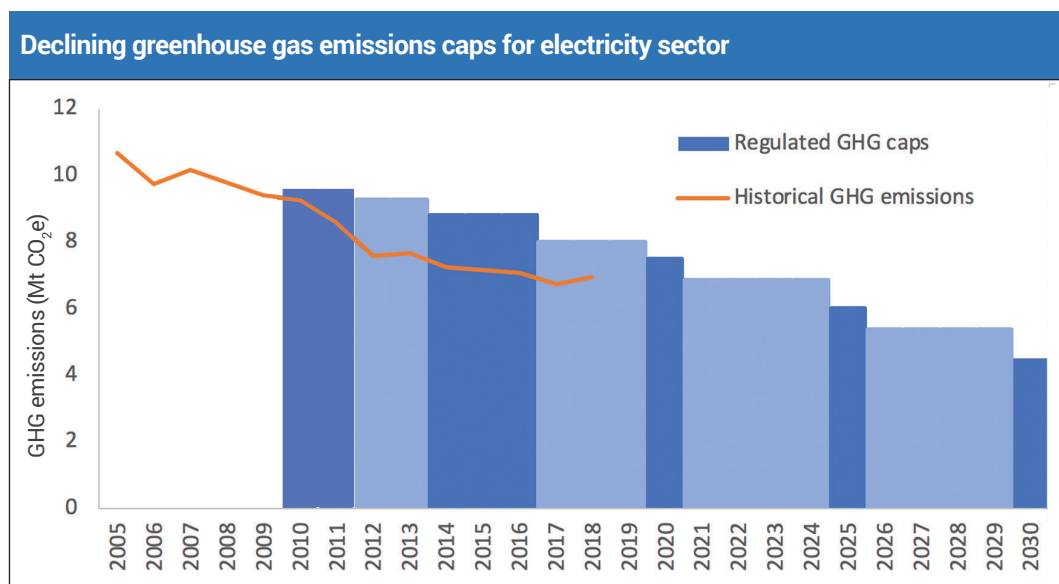
Green Fund

The cap and trade program is expected to reduce greenhouse gas emissions by at least 650,000 tonnes of CO₂e from 2019 to 2022. We estimate it will generate about \$27 million in revenue in 2020, increasing to \$32 million in 2023. All the revenue will go into the Green Fund and be fully reinvested in climate change initiatives that benefit Nova Scotians.

The fund can be used for further reducing greenhouse gas emissions, supporting clean technology research and development, adapting to climate change, and delivering climate change engagement and awareness programs. It can be used to help the province participate in regional and international climate change initiatives. It can also be used to offset social and economic costs of the cap and trade program for vulnerable Nova Scotians.

Reducing emissions from the electricity sector

Nova Scotia's progress to date in reducing greenhouse gas emissions is due in large part to action in the electricity sector. Our Greenhouse Gas Emissions Regulations set hard, declining caps on greenhouse gas emissions from the electricity sector. This allows Nova Scotia Power Inc. to plan an affordable transition away from fossil fuels and toward cleaner electricity.



Nova Scotia Power Inc. is required by law to invest in energy efficiency when it is the most cost-effective option for ratepayers. We are the only province with such a law, established in 2015. As a result, through their power bills, Nova Scotians are investing about \$35 million per year in energy efficiency. This is part of the company's Demand Side Management Program.

Clean, renewable energy

Nova Scotia has tripled clean energy generation in the last decade. We met our goal for 25% of electricity generated coming from renewables in 2015, set in the Renewable Electricity Regulations. We are on track to hit our next goal of 40% by 2020.

Wind is an important source of clean electricity in Nova Scotia. By 2018, it generated 18% of our electricity. The Community Feed-in-Tariff Program (COMFIT) was a key factor in this success. From 2011 to 2016, it supported 150 megawatts of community-owned clean energy for more than 100 community organizations.

In recent years, we launched programs to help Nova Scotians install solar electricity systems. We have invested \$3.5 million to date in the SolarHomes Program. It offers a rebate for homeowners to install solar photovoltaic systems. Homeowners can also access the Enhanced Net-Metering Program, which allows them to sell any excess renewable electricity they produce to Nova Scotia Power Inc. Non-profit organizations are also getting involved in solar energy through the Solar Electricity for Community Buildings Program, which allows them to sell power back to their utility.

Nova Scotia is working to expand and diversify clean energy generation. We are exploring district energy, smart grid, and battery storage technologies through partnerships and pilot programs. Research into these technologies is key to informing how clean energy can be further integrated into the Nova Scotia grid.

Equivalency agreement on coal-fired electricity

Our actions to reduce greenhouse gas emissions from the electricity sector positioned us to negotiate an important agreement with the federal government that will save Nova Scotians hundreds of millions of dollars.

The equivalency agreement on coal-fired electricity helps us move to clean electricity in a way that makes sense for Nova Scotia. It ensures that our Greenhouse Gas Emissions Regulations apply in Nova Scotia instead of the federal government's coal-fired electricity regulations. With our regulations, we will achieve the same or better reductions at a much lower cost to ratepayers.



Energy efficiency for homes, businesses, and communities

Heating and cooling make up the largest source of energy demand in buildings. In homes, heating and cooling can be as much as 60% of total energy usage. High energy use is associated with high costs and elevated greenhouse gas emissions. High energy requirements can also eat into a business's bottom line and make it challenging to operate community facilities.

Efficiency Nova Scotia was established in 2011 and is Canada's first energy efficiency utility. It delivers a range of programs to help homeowners and businesses make upgrades. To date, they've achieved more than \$950 million in energy savings and helped more than 400,000 Nova Scotians. These programs prevent the release of more than 1,000,000 tonnes of greenhouse gas emissions annually, a number that is growing as more Nova Scotians take advantage of the programs. These programs have led to more than 1,400 full-time jobs in the energy efficiency industry, and that number is also growing.

Efficiency Nova Scotia provides an onsite energy manager service to work with businesses, municipalities, and government departments on energy-saving projects. Provincial departments have been making use of these services, including the Department of Agriculture. The department hired an onsite energy manager in 2017 to perform energy audits, recommend energy-efficient technologies, and prepare business cases for electricity and greenhouse gas reductions on Nova Scotia farms. To date, 71 farm energy assessments have been completed.

Collaboration with other governments

We are working with our federal partners to power their facilities with 100% clean electricity by 2025. This project will require 100,000 megawatt hours of new renewable electricity. That's the equivalent of powering about 10,000 homes. This effort will create more opportunities for green jobs in the province.

We are also working with Atlantic partners on an assessment of clean energy opportunities in this region. Led by the federal government, the initiative is investing \$2 million over two years to support forecasting, modelling, and developing a roadmap for clean energy opportunities.

In 2019, the Federation of Canadian Municipalities announced \$18 million to establish a low carbon innovation centre in Halifax. The centre will be part of a network across Canada that supports local actions to adopt and accelerate climate change solutions.



The province is investing in a variety of programs to help reduce energy demand by improving energy efficiency for all Nova Scotians. The HomeWarming program covers energy efficiency assessments and upgrades free of charge for low-income homes. With the help of Nova Scotia Power Inc., the Clean Foundation and Efficiency NS, the program has invested \$60 million for upgrades in more than 8,600 homes since 2015. The program supports homes that are heated both by electricity and by oil.

These types of upgrades will also be taking place in social housing units across the province. In 2019, Housing Nova Scotia announced \$11 million for energy efficiency upgrades for more than 100 public housing units in 51 communities. The federal government is matching that investment through the green stream of the Investing in Canada infrastructure plan. Upgrades include exterior cladding, insulation, energy efficient windows and doors, and some solar panels. Other buildings will be assessed for attaining net-zero energy in the future.

In 2018, the Department of Energy and Mines partnered with Efficiency Nova Scotia and the Assembly of Nova Scotia Mi'kmaq Chiefs on a pilot program that provided energy efficiency upgrades to 100 homes in all 13 Mi'kmaq communities across the province. These households are now saving an average of \$900 per year on their energy bills.

Building on the success of this pilot, the provincial and federal governments are investing \$14 million in the first four years of a 10-year Mi'kmaq Home Energy Efficiency Project. All band-owned homes on reserves qualify for upgrades like new insulation, heat pumps, and draft-proofing. These upgrades will lower heating and power bills, create more comfortable and durable homes, cut greenhouse gas emissions, and create green jobs in Mi'kmaq communities.

Federal investments in energy efficiency

The federal government's Low Carbon Economy Fund helps reduce greenhouse gas emissions across the country. Nova Scotia's share is \$56 million over the next four years. So far, we've invested it in expanding Efficiency Nova Scotia programs and projects that focus on non-electric building efficiency. This includes building envelope upgrades, heating equipment upgrades such as heat pumps, efficient products such as smart thermostats, and solar photovoltaic.



Clean transportation

Clean transportation includes many modes such as public transit, active transportation, car sharing, ride sharing, ride hailing, and bike and scooter sharing. In 2013, Nova Scotia released the Sustainable Transportation Strategy: Choose How You Move. It set out guiding principles on collaborative, innovative, and local solutions to clean transportation challenges.

The Nova Scotia Moves grant program was released at the same time and invested \$3 million in 75 projects across the province. They included active transportation, engagement, alternative fuels, fleet efficiency, and public transit projects.

Nova Scotia Moves prompted the launch of Connect2 which aims to make it possible to bike, walk or roll between key destinations in our communities. Connect2 is now being funded under the Low Carbon Communities Program and has made investments of more than \$2.4 million since 2015.

In 2019, Connect2 expanded to fund projects that decrease dependence on personal vehicles. Projects that lead to improved transportation and integrated mobility systems can include clean fleets and shared mobility, as well as community building and engagement. These themes were discussed in 2019 during the inaugural provincial sustainable transportation conference, A to B, which brought together government, community organizations, industry professionals and members of the public.

Nova Scotia is preparing for Zero-Emission Vehicles (ZEVs) in the province. ZEVs are gaining momentum globally. As their cost continues to decline, more and more people will be able to buy them. A highway network of 14 electric fast charging stations and more than 100 local public charging stations has been installed across the province. This means ZEVs can make longer-distance trips in all parts of Nova Scotia. We are also supporting education and outreach programs such as the Clean Foundation's EVAssist and NextRide campaign, which allows Nova Scotians to test drive and learn more about electric vehicles.

Cycling Network

In 2019, the federal and provincial governments partnered with Halifax Regional Municipality to invest \$25 million to accelerate the development of the city's All Ages and Abilities cycling network. It is a key piece of the city's Integrated Mobility Plan and includes facilities that are safe and accessible for a wide range of cycling abilities. The investment will support upgrades and development of 30 km more bicycle infrastructure by 2022.





Protecting our coastline, waterways, and land

With more than 70% of Nova Scotia's population living within 20 km of the coast, it is critical that coastal communities adapt to climate change. The Coastal Protection Act was passed in April 2019 and will come into effect once regulations are complete. This legal protection of the province's coast will prevent development and activity that damages the environment. It will also prevent activities that put homes and other buildings at risk of damage or destruction from sea level rise, coastal flooding, storm surge, and coastal erosion.

In 2019, the federal and provincial governments committed \$114 million to restore Western Nova Scotia's dykelands. This includes 60 km of dykes and five aboiteaux in the Bay of Fundy and Minas Basin dyke system. Strengthening the dykelands will protect the region's ecosystem, communities, farmlands, and cultural sites from the impacts of rising tides and storm surge.

Floods are projected to increase with the effects of climate change. The province is working on guidelines that reflect climate change scenarios to help create better municipal flood risk maps. They will help municipalities with land use planning that keeps Nova Scotians and infrastructure safe from flooding.

The province's Flood Risk Infrastructure Investment Program helps municipalities assess flood risk, develop mitigation plans, and invest in risk reduction infrastructure. For example, more than \$200,000 from the fund is helping to construct flow control structures for the Wash Brook watershed following the 2016 Thanksgiving Day floods in Cape Breton Regional Municipality.

Land protection is part of a natural solutions approach to climate change. Protected areas can play a direct role by capturing and storing carbon dioxide, producing oxygen, and mitigating climate change impacts on nature and our communities. Protected areas in the province include wilderness areas, nature reserves and provincial parks, federal parks and national wildlife areas, and conserved private lands. We have protected 12.73% of the province's land and continue to work toward our 13% goal.



Building capacity to adapt

While we fight climate change by reducing greenhouse gas emissions, there are still impacts that we cannot prevent. We must develop the capacity to adapt to them.

The Climate Adaptation Leadership Program helps government departments, and their industry and community partners better plan for climate-related risks and opportunities. The program moves away from short-term adaptation projects and towards more intentional capacity-building. It builds participants' capability to anticipate and respond to climate change. The program also aims to enhance the social and technical skills required for effective action.

This approach has helped the Department of Agriculture develop a climate adaptation plan and start implementing it. The plan included climate scenarios that were developed for the grape and wine industry. In 2019, the federal and provincial governments committed more than \$1.8 million to enhance and expand the program to the departments of Health and Wellness and Communities, Culture and Heritage and their sector partners.

Education on climate change

Climate change education in our schools helps young Nova Scotians understand, take action, and adapt to climate change. We have been integrating environmental sustainability in elementary and secondary classrooms since 2000 and encouraging students to be engaged and empowered. The province continues to integrate these concepts into curricula and resources. For example, the grade 7 and 8 curricula are being updated with specific units on environmental action and climate change. They were piloted in over two years starting in 2018 and will be in place in all schools by fall 2020.

The Department of Education and Early Childhood Development has strong partnerships with organizations that provide workshops and resources for public schools on environmental sustainability and climate change. Partners include the Clean Foundation, the Discovery Centre, and Dalhousie University.

Climate data, impacts, and risks

We are collaborating with federal, provincial and territorial colleagues to assess regional climate-related risks. As part of this process, we are engaging with government organizations, the private sector, and the public to discuss risk, capacity, and priority investment areas. This helps decision makers prioritize climate change adaptation work based on the areas of highest risk and opportunity.

III. LOOKING AHEAD

Addressing climate change is a shared challenge. It requires leadership from all levels of government, the private sector, and not-for-profit organizations. It also requires a meaningful effort by individual Nova Scotians and families.

By working together, we will establish a low carbon economy that reduces greenhouse gas emissions, creates green jobs, and ensures a clean environment for future generations. We will build strong, resilient communities that meet the challenges and seize the opportunities that come with a changing climate.

Extreme heat events

Helping Nova Scotians take care of their health in a changing climate is a priority. Infants, young children, older adults, and people with chronic illnesses are most vulnerable during heat waves, which will likely happen more frequently with climate change. To help alert these populations and their families, the Department of Health and Wellness partnered with Health Canada and Environment and Climate Change Canada in 2018 to develop a Heat Alert Response System. It will notify the public of heat events so they can take action to protect themselves.



© Crown copyright, Province of Nova Scotia, 2019

Climate Change Progress Report 2019
Department of Environment
October 2019
ISBN: 978-1-55457-999-0