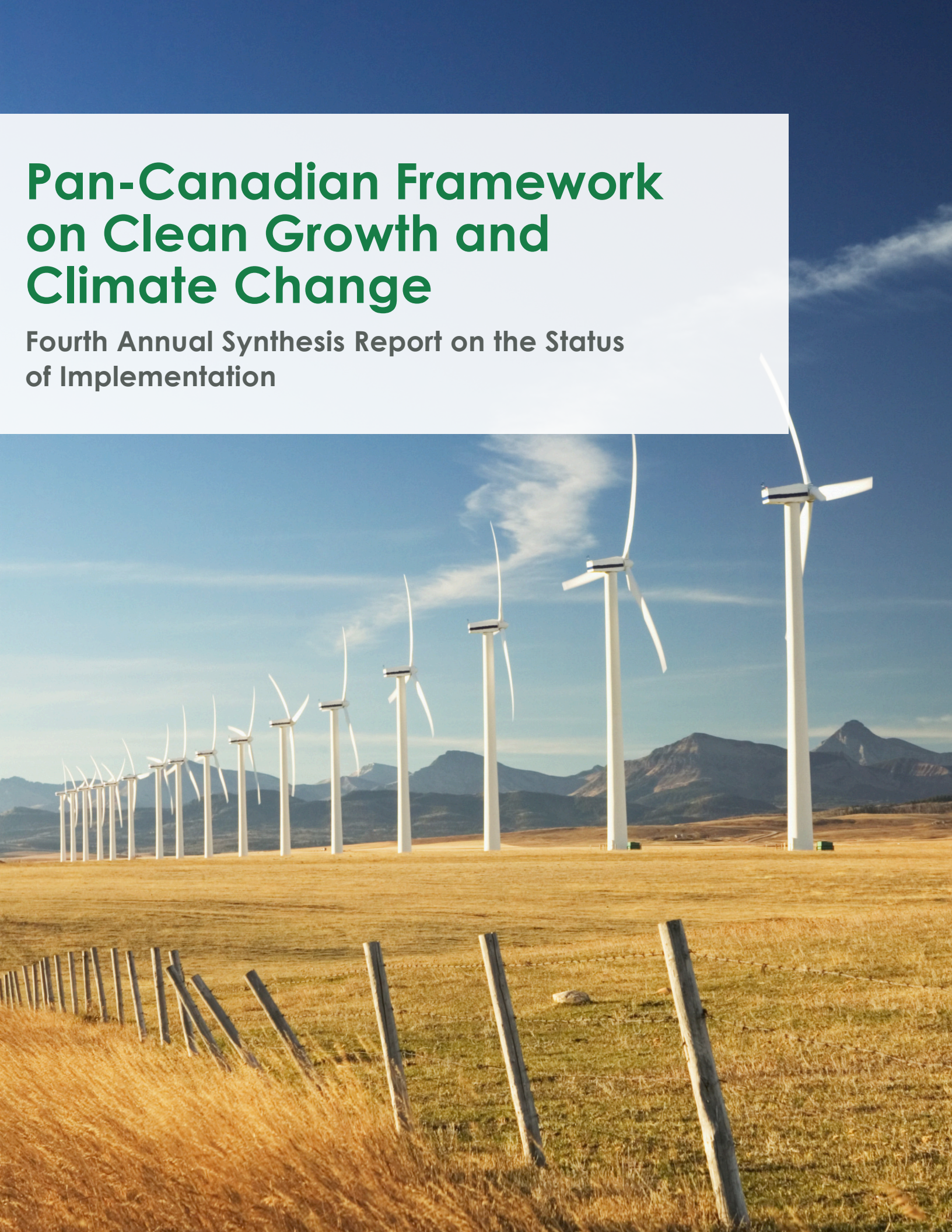
Pan-Canadian Framework on Clean Growth and Climate Change

Fourth Annual Synthesis Report on the Status of Implementation



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Pan-Canadian Framework on Clean Growth and Climate Change

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Executive Summary

Canada's First Ministers adopted the Pan-Canadian Framework on Clean Growth and Climate Change (PCF) on December 9, 2016.[1] The PCF is the federal, provincial, and territorial plan to grow the economy, reduce greenhouse gas (GHG) emissions, and build resilience in the face of a changing climate. It builds on existing leadership and actions taken individually and collectively by the provinces and territories, including commitments from the Declaration of the Premiers adopted at the Québec Summit on Climate Change in 2015 and from the Vancouver Declaration on Clean Growth and Climate Change at the First Ministers Meeting in March 2016. The PCF is built on four pillars, 1) pricing carbon pollution, 2) complementary actions to reduce emissions, 3) adaptation and climate resilience, and 4) clean technology, innovation, and jobs.

The COVID-19 pandemic has disrupted lives and economies worldwide. At the same time, impacts of climate change contributed to devastating heat waves, ice loss, wildfires, floods and droughts, affecting communities, nations and economies around the world.[2] An approach to pandemic response that supports economic recovery while helping to achieve our climate objectives is crucial for a stronger, more resilient Canada. Many governments around the world, including all provincial, territorial and federal governments in Canada, are taking action to "build back better"[3] – stimulating their economies through measures that enhance sustainability and resilience.

According to the Canadian Institute for Climate Choices' *Tip of the Iceberg* report released in 2020, the number of catastrophic weather events in Canada between 2010 and 2019 was more than three times higher than in the 1980s.[4] Meanwhile, the combined economic losses per weather-related disaster have also ballooned—rising from an average of $8.3 million per event in the 1970s to an average of $112 million per event between 2010 and 2019. Canada's *Climate Science* 2050 synthesis report, also published in 2020, identified the critical role of science and knowledge in guiding the swift and ambitious action needed to build a resilient, carbon-neutral Canada.[5]

In addition to reducing GHG emissions and improving Canada's resilience to climate change, climate action by federal, provincial and territorial governments is producing many economic, social and health benefits for Canadians. New economic opportunities are emerging for Canadian clean technology and participation in the global market for low-carbon goods and services. Energy efficiency retrofits are helping Canadians make their homes and buildings energy-wise, more comfortable and more affordable. Public transit expansion is improving the livability of cities across the country. Actions such as phasing-out of traditional coal-fired electricity generation by 2030 will improve air quality, leading to better health outcomes for Canadians.

The fourth Annual Synthesis Report summarizes progress achieved in 2020 by federal, provincial, and territorial governments, in partnership with Indigenous Peoples and through engagement with stakeholders, in collectively implementing the PCF.

1 Saskatchewan and Manitoba did not adopt the PCF at that time. Manitoba has since joined. Although Saskatchewan did not adopt the PCF, the province continues to contribute to the annual Synthesis Report.

2 United in Science 2020 Report. Available at: https://public.wmo.int/en/resources/united_in_science

3 https://www.oecd.org/coronavirus/policy-responses/building-back-better-a-sustainable-resilient-recovery-after-covid-19-52b869f5/

4 https://climatechoices.ca/wp-content/uploads/2020/12/Tip-of-the-Iceberg-_-CoCC_-Institute_-Full.pdf

5 http://publications.gc.ca/collections/collection_2020/eccc/En4-414-2020-eng.pdf

Summary of Progress

In 2020, the fourth year of PCF implementation, federal, provincial, and territorial governments continued to implement the more than fifty actions outlined in the PCF as well as develop new initiatives.

Federal, provincial, and territorial governments continued making progress on **pricing carbon pollution**. This included greenlighting new pricing systems in New Brunswick and Ontario, and continuing or updating existing systems in other jurisdictions. Both an interim report of carbon pricing systems and an expert assessment were initiated for completion in 2021. Carbon pollution pricing systems continue to operate in all jurisdictions across Canada.

Governments also continued to make progress on implementing a host of **complementary actions to reduce GHG emissions**. In 2020, important progress was made in the industrial sector, as new federal and provincial methane regulations came into force.

In 2020, governments continued to: support the further expansion of renewable energy capacity; expand the production and consumption of low-carbon fuels; build up climate-resilient infrastructure; expand energy efficiency in new and existing residential, commercial, and industrial buildings; support further uptake of zero or low-emitting transportation; and further utilize mitigation opportunities including carbon sequestration within the forestry, agriculture, and waste sectors. For example, the federal Northern Responsible Energy Approach for the Community Heat and Electricity (Northern REACHE) and Clean Energy for Rural and Remote Communities (CERRC) programs are both targeted at reducing the reliance of northern, rural and remote communities on diesel fuel for heat and power. Governments proceeded with further actions to increase zero-emissions vehicle (ZEV) uptake, through both expansion of existing purchase incentives and charging infrastructure as well as federal and provincial actions on hydrogen fuel and expanded investment in public transit. The release of the Hydrogen Strategy for Canada is also contributing to expanding the use of clean fuels and to position Canada as a global industrial leader of clean renewable fuels. Government leadership on climate change was strong in 2020, with several governments setting new, more ambitious emissions reduction targets and updating their climate plans.

Governments continued to make progress on a number of **adaptation** initiatives to build climate resilience, manage risks to health and infrastructure, and help ensure that all Canadian communities are able to thrive in a changing climate. Progress included the development of Yukon adaptation actions in *Our Clean Future: A Yukon strategy for climate change, energy and a green economy* and renewed commitments and actions on adaptation in Québec, through the *2030 Plan for a Green Economy* (2030 PGE). The federal commitment to develop Canada's first National Adaptation Strategy will complement provinces and territories' actions. Also, the federal government released the *Climate Science 2050: Advancing Science and Knowledge on Climate Change* report and multiple regional climate organizations were either planned or established, which were all crucial 2020 outcomes to support the PCF commitment to translate scientific information into action.

As Earth continues to warm, high-latitude countries like Canada are more likely to experience strong impacts, including an increase in the frequency and intensity of extreme weather events. Canadians will confront more natural hazards, such as storms, forest fires, heat waves, floods and droughts, which will test their resilience and challenge their ability to adapt to the new climatic conditions.[6] These impacts

6 https://www.preventionweb.net/files/13008_CanadiansatRisk20101.pdf

are likely to push the limits of Canada's existing infrastructure, and governments will need to continue to work together to address this increasing concern. In 2020, the Disaster Mitigation and Adaptation Fund (DMAF) announced funding for eight large-scale infrastructure projects, and the Investing in Canada Infrastructure Program (ICIP) invested $76 million into eight projects that focused on increasing capacity to adapt to climate change impacts, natural disasters, and extreme weather events.

Governments continued or launched provincial or regional climate-wide risk assessments to evaluate climate change-related health impacts, and worked to support healthy First Nations and Inuit communities through involving these communities in governance decisions and monitoring programs, as well as through initiatives like the federal Climate Change and Health Adaptation Program (CCHAP). Some regions, specifically on the coasts and in remote, northern and Indigenous communities, are more vulnerable and thus disproportionally affected by climate change. To support these regions and communities, governments continued utilizing programs like the Climate Change Preparedness in the North (CCPN) Program, First Nation Adapt, and the Indigenous Community-Based Climate Monitoring Program, funding 133, 68, and 63 projects respectively.

Governments also continued to invest in **clean technology and innovation**, with the global clean technology market set to exceed $2.5 trillion by 2022 and clean technology companies employing more than 195,000 Canadians in 2020.[7] Collaborative actions, such as British Columbia and Canada jointly funding the BC Cleantech Cluster Initiative to bring together stakeholder groups to help advance the province's clean technology industry, came alongside individual efforts, like Nova Scotia partnering with Innovacorp, its early-stage venture capital organization, to support clean tech companies. Governments also began using the data produced through the Clean Technology Data Strategy to better inform decision-making, improve knowledge and foster innovation. In Alberta, the Technology Innovation and Emissions Reduction (TIER) Fund is invested in innovation, research and technology projects to reduce emissions while supporting jobs, including programs delivered by the province, Emissions Reduction Alberta, Alberta Innovates, and others.

The Government of Canada continued meaningful and collaborative engagement with Indigenous Peoples through the three distinctions-based[8] senior bilateral tables, in accordance with the joint commitments made by the Prime Minister, National Leaders of the Assembly of First Nations (AFN), Inuit Tapiriit Kanatami (ITK) and the Métis National Council (MNC) in 2016. Canada and the Assembly of First Nations identified five areas for collaboration, better orienting the work of the First Nations-Canada Joint Committee on Climate Action (JCCA), which met throughout 2020. The Métis Nation-Canada Joint Table on Clean Growth and Climate Change continued relationship-building and information-sharing to identify Métis Nation-specific considerations for program design and funding delivery under the PCF. The Inuit-Canada Joint Table on Clean Growth and Climate Change also met, and Canada provided funding to implement the National Inuit Climate Change Strategy (NICCS). The federal government continues to work to better support Indigenous Peoples as leaders to advance their self-determined priorities and plans on clean growth and climate change.

Québec conducted specific consultations with Indigenous communities in late 2019 and February 2020 as part of the development of the *2030 Plan for a Green Economy* (2030 PGE). These consultations were published in 2020[9] and helped guide the investments in Québec's *2021–2026 Implementation Plan* to

7 https://www.ic.gc.ca/eic/site/098.nsf/eng/00023.html

8 A distinctions-based approach acknowledges that First Nations, Inuit, and the Métis Nation are distinct, rights-bearing communities with their own histories, including with the Crown. This approach acknowledges that partnership must reflect the unique interest, priorities, and circumstances of each People.

9 Consultation des communautés autochtones (quebec.ca). Consultation de la Nation crie concernant l'élaboration du plan pour une économie verte 2030 (quebec.ca)

support Indigenous community leadership in the climate transition. In 2020, British Columbia continued to work closely with Indigenous peoples to build stronger partnerships and act on shared goals. For example, B.C. worked together with communities to support clean energy infrastructure in remote communities and develop a provincial climate preparedness and adaptation strategy.

Looking Ahead

Moving forward, governments will continue their efforts to make progress on the actions committed to under the PCF as well as generate new policies and programs to fight climate change, improve resilience, and further promote clean growth. These efforts include developing and finalizing new regulations, programs and policies at the federal and provincial-territorial levels, increasing investment in new climate-resilient infrastructure, and developing new and ongoing initiatives, all of which will promote a greener economy and reduce emissions from key sectors such as industry, infrastructure, transportation, buildings, agriculture, and forestry.

In December 2020, the Government of Canada released *A Healthy Environment and A Healthy Economy* as the federal government's strengthened climate plan (SCP) with $15 billion in new investments to allow Canada to meet and exceed the national GHG reduction target, or the Nationally Determined Contribution (NDC), for 2030. Canada's NDC in 2020 was an "economy-wide target to reduce its greenhouse gas emissions by 30 per cent below 2005 levels by 2030." This is equivalent to reducing 2030 emissions to 511 megatonnes (Mt) from 739 Mt in 2005. Full implementation of the PCF, and all provincial and territorial mitigation measures that had been announced by 2020, are projected to reduce Canada's emissions by 142 Mt in 2030 compared to 2005 levels (19 per cent below 2005 levels). Canada's SCP is projected to reduce Canada's emissions in 2030 by an additional 85 Mt, bringing Canada's 2030 emissions to 512 Mt (31 per cent below 2005 levels).[10]

Across the provinces and territories, work anticipated in 2021 and beyond includes: the implementation of Alberta's Bill 36, the *Geothermal Resource Development Act*; the coming-online of Manitoba's Keeyask generating station, Newfoundland and Labrador's Muskrat Falls generating station, and Nunavut's new district heating systems in Taloyoak and Sanikiluaq; Manitoba's amended *Biofuels Act* regulations, further increasing the use of renewable fuels; Prince Edward Island switching more facilities to biomass heating; Northwest Territories completing a multi-year project at Moose Kerr School in Aklavik resulting in the installation of a 300kW biomass boiler; a number of research projects being completed in Alberta, Saskatchewan, and Manitoba through the Prairie Regional Adaptation Collaborative (PRAC); the development of a First Nations and Metis public safety strategy through the new Saskatchewan Public Safety Agency (SPSA); and the completed grid connection of Alberta's Fort Chipewyan solar farm. The Government of Québec will be launching actions from its 2030 PGE first implementation plan for 2021–2026, ensuring interventions in all priority areas that are mitigating climate change, building the economy of tomorrow, reinforcing resilience to the impacts of climate change, creating a predictable environment favorable to climate transition and develop and disseminate the necessary knowledge to guide transition.

10 On April 22, 2021, at the Leaders Summit on Climate, the Prime Minister announced an enhanced emissions reduction target of 40-45 per cent reductions below 2005 levels by 2030. This enhanced target was submitted to the United Nations Framework Convention on Climate Change in July 2021 as Canada's NDC.

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Introduction

In 2020, the average global temperature rose to 1.2° Celsius above pre-industrial levels.[11] In Canada, on average, temperature increases are approximately two times the magnitude of the global average and more than double in northern Canada.[12] The effects of rising temperatures include more extreme heat, less extreme cold, longer growing seasons, shorter snow and ice cover seasons, thinning glaciers, thawing permafrost, and rising sea levels. We have seen the consequences of global warming with increased drought, wildfires, and flooding. In Canada, the environmental, health, and economic impacts of climate change have been staggering and are projected to intensify. Rising temperatures and catastrophic weather events have had tangible costs. According to the Canadian Institute of Climate Choices, weather-related disasters are hitting more often and costing more to address each year. Catastrophic weather events in the past decade have cost over $18 billion, in insured losses alone.[13]

Federal, provincial, and territorial governments committed to take action on climate change through the Pan-Canadian Framework on Clean Growth and Climate Change (PCF), in 2016.[14] Over the past four years, federal, provincial, and territorial governments have worked together, as well as with Indigenous Peoples, to reduce greenhouse gas (GHG) emissions, build resilience to the changing climate, and enable sustainable economic growth. Actions under the PCF also present numerous opportunities, such as cost savings from energy efficiency, increased air quality from decarbonisation, more resilient and green infrastructure, and improving health outcomes. Many governments are

11 United Nations Framework Convention on Climate Change January 14, 2021 Press Release

12 https://changingclimate.ca/CCCR2019/

13 2019 Canadian Institute for Climate Choices Report: Tip of the Iceberg

14 Saskatchewan and Manitoba did not adopt the PCF at that time. Manitoba has since joined. Although Saskatchewan did not adopt the PCF, the province continues to contribute to the annual Synthesis Report.

leveraging opportunities to build back from the COVID-19 pandemic in ways that create a healthier planet and greener economy. For example, governments are investing in public transportation, clean technology, and committing to sustainably manage forests, wetlands, and agricultural lands.

This Fourth Annual Synthesis Report reports on progress made in 2020 by federal, provincial, and territorial governments, in partnership with Indigenous Peoples, to implement more than fifty measures in the PCF to reduce GHG emissions, adapt and build resilience to a changing climate, and facilitate clean economic growth.

2.0 Pricing Carbon Pollution

The PCF identified carbon pollution pricing as an important and crosscutting mitigation measure. Several provinces have taken substantial leadership on carbon pollution pricing. British Columbia and Québec each have had a broad carbon pollution pricing system in place for over a decade. Alberta has priced industrial GHG emissions, which represent over half their economy's emissions, since 2007.

In October 2016, Prime Minister Trudeau announced the Pan-Canadian Approach to Pricing Carbon Pollution that introduced the federal benchmark establishing minimum national standards of stringency for GHG emissions pricing. This approach gives provinces and territories the flexibility to design their own carbon pollution pricing policies, while outlining criteria to ensure they are all stringent, fair, and efficient.

Federal Carbon Pollution Pricing System

Pursuant to the *Greenhouse Gas Pollution Pricing Act*, adopted on June 21, 2018, the federal carbon pollution pricing system has two components: a regulatory charge on fuel (fuel charge) and a trading system for industry, also known as the Output-Based Pricing System (OBPS).[15]

The federal carbon pollution pricing system applies in any jurisdiction that requested it or that does not implement its own system that meets the federal benchmark. The federal benchmark requires a price on carbon pollution of $20 per tonne of GHG emissions in 2019, rising by $10 each year to $50 per tonne in 2022. The Government of Canada carries out an annual assessment process to ensure that provincial carbon pollution pricing systems meet the federal benchmark, and to monitor major changes by provincial and territorial governments.

15 In 2020, Saskatchewan, Ontario, Manitoba and Alberta had legally challenged the *Greenhouse Gas Pollution Pricing Act*, including its constitutionality.

The federal fuel charge applies in Ontario, Manitoba, Saskatchewan, Alberta, Yukon and Nunavut. The federal fuel charge applied in New Brunswick in 2019, but ceased to apply as of April 1, 2020. The federal OBPS applies in Ontario, New Brunswick, Prince Edward Island, Manitoba, Yukon, Nunavut, and partially in Saskatchewan. On September 20, 2020, the Minister of Environment and Climate Change Canada informed Ontario and New Brunswick that their carbon pollution pricing systems for industrial facilities meet the federal benchmark for the sources they cover. As a result, the Government of Canada intends to stand down the federal OBPS in both provinces as of dates to be determined in consultation with each of the two provincial governments.[16] All provinces and territories implementing their own carbon pricing system have a price on carbon pollution that met the federal benchmark for 2020.

All direct proceeds from the federal fuel charge in Yukon and Nunavut are being returned to the governments of these territories, as they voluntarily adopted the federal system. In Ontario, Manitoba, Saskatchewan and Alberta – provinces that did not voluntarily adopt the federal system – all direct proceeds from the federal fuel charge are being returned to the jurisdiction of origin through Climate Action Incentive payments made directly to individuals, and through federal programing. Proceeds collected from the federal OBPS will be used to further support industrial projects to cut emissions and use new cleaner technologies and processes. The jurisdictions that have voluntarily adopted the federal OBPS system (i.e., Prince Edward Island, Yukon and Nunavut) will be given the option to directly receive proceeds collected and decide on how to use them.

Federal, provincial, and territorial governments worked together in 2020 to establish an approach to review carbon pollution pricing systems across Canada. As per the commitment in the PCF, an interim report was initiated in August 2020 to provide an updated, factual overview of all carbon pricing systems currently in place across Canada. A separate, independent expert assessment was launched in November 2020.[17]

Alberta's Technology Innovation and Emissions Reduction (TIER) Regulation came into force in January 2020, as the next enhancement to Alberta's industrial carbon pricing regime which started in 2007. TIER aims to provide greater competitiveness protection to emissions-intensive and trade-exposed sectors by introducing facility-specific benchmarks. The TIER system design drives emission reductions in industry as well as across all sectors as it includes emissions trading and investment in clean technology.

Other Federal, Provincial, and Territorial Carbon Pollution Pricing-Related Initiatives

Jurisdictions continued to refine their carbon pollution pricing systems in 2020. British Columbia released world-leading industry

16 In March 2021, Canada informed Ontario of the decision to transition the federal OBPS to the provincial EPS program on January 1, 2022. Also in April 2021, Canada informed New Brunswick of the decision to transition the federal OBPS to their provincial OBPS effective January 1, 2021.

17 The assessment was completed in 2021: https://publications.gc.ca/site/eng/9.900084/publication.html

emissions benchmarks under the CleanBC Industrial Incentive program, encouraging cleaner industrial operations and reducing carbon tax costs incurred over $30 per tonne CO_2e for low emission facilities. In June 2020, the program's CleanBC Industry Fund closed its second call for innovative projects to reduce emissions. The 2020 CleanBC Industry Fund is investing approximately $33 million in carbon tax revenue in 22 emission-reduction projects, with industry and partners contributing an additional $51 million. Nova Scotia's cap-and-trade program covers about 87 per cent of the province's GHG emissions. Launched in January 2019, the program had its first two auctions in 2020, which generated over $28 million in revenue. Ontario has developed an Emissions Performance Standards program to regulate GHG emissions from large emitters. The federal government has indicated that this program meets the federal benchmark. In Québec, the revenues from its carbon market are transferred to the Fonds d'électrification et de changements climatiques, which replaced the Fonds vert in 2020, and are used exclusively to fund climate actions. It is thus a large contributor to the new Québec climate plan, the *2030 Plan for a Green Economy* (2030 PGE) that was launched in November 2020.

3.0 Complementary Actions To Reduce Emissions

To mitigate emissions from fossil fuels, complement carbon pollution pricing, and transition Canada to a low-carbon economy, targeted mitigation action across sectors is critical.

These efforts to reduce GHG emissions can help to create new markets for low-carbon goods and services; reduce costs for Canadians that make life more affordable; and provide businesses with the incentives and opportunity to develop and use cleaner and more efficient technologies. In 2020, governments continued to implement a number of regulatory and programmatic measures, with a specific focus on green economic recovery efforts in response to the COVID-19 pandemic.

Electricity

In the PCF, governments committed to work collaboratively to invest in the use of clean electricity, increase generation from non-emitting and renewable sources, modernize existing electricity systems, and reduce diesel reliance in northern, remote, and Indigenous communities.

Canada already has one of the cleanest electricity systems in the world, with almost 82 per cent of electricity coming from non-emitting sources.[18] Governments continued to advance efforts to further increase renewable and non-emitting sources in 2020, with the aim of having 90 per cent of electricity generated from non-emitting sources by 2030.[19]

18 https://www.nrcan.gc.ca/energy-and-greenhouse-gas-emissions-ghgs/20063#L3

19 https://www.canada.ca/en/services/environment/weather/climatechange/climate-action/powering-future-clean-energy.html

The Hydrogen Strategy for Canada was released in 2020, which identified opportunities to integrate hydrogen into renewable energy systems in Canada, and continued to support renewable energy projects through the Emerging Renewable Power Program and the Investing in Canada Infrastructure Program. In its new 2030 PGE, Québec committed to develop a strategy on green hydrogen and bioenergy, as well as a $15 million investment in the green hydrogen sector. Despite accounting for less than 7 per cent of total electricity generation, coal was responsible for 63 per cent of electricity-related GHG emissions in 2018.[20] Canada and Nova Scotia's renewal of their equivalency agreement on traditional coal-fired electricity, reached in 2019 which came into force in 2020, gives Nova Scotia the flexibility to meet or exceed the GHG reductions that would have resulted from the federal coal regulation at the lowest cost to ratepayers.

In December 2020, **Canada** launched its Hydrogen Strategy and committed to work with all levels of governments, Indigenous organizations and other stakeholders to identify the economic and environmental opportunities for clean production and use of hydrogen across all sectors of the Canadian economy.

Saskatchewan made progress on a number of wind and solar projects in 2020, including the 200 megawatt Golden South Wind Project. Saskatchewan's government-owned utility, SaskPower, signed Power Purchase Agreements for two 10-megawatt solar power generation projects through the First Nations Power Authority. Saskatchewan also committed to exploring the development and deployment of small modular nuclear reactors to help meet the challenges of climate change.

Governments continued to invest in and support renewable energy sources with the aim of increasing their usage. The proportion of Canada's total primary energy supply (TPES) from renewable sources accounted for 16.4 per cent of TPES in 2018.[21] Development of hydroelectric projects such as the Site C Clean Energy and Peace Region Energy Electricity Supply Projects in British Columbia and the Muskrat Falls Generating Project in Newfoundland and Labrador are ongoing and will add an additional 3259 megawatts of capacity.[22] Alberta, British Columbia, Ontario, and Québec began planning for the increased development of hydrogen in their respective provinces. Saskatchewan, Québec, New Brunswick, and Nova Scotia all amended or exceeded their renewable energy and electricity standards.

20 https://www.nrcan.gc.ca/science-data/data-analysis/energy-data-analysis/energy-facts/energy-and-greenhouse-gas-emissions-ghgs/20063

21 https://www.nrcan.gc.ca/science-data/data-analysis/energy-data-analysis/energy-facts/energy-and-greenhouse-gas-emissions-ghgs/20063#L5

22 https://www.cer-rec.gc.ca/en/data-analysis/energy-commodities/electricity/report/2017-canadian-adoption-renewable-power/canadas-adoption-renewable-power-sources-energy-market-analysis-hydro.html

Nova Scotia and **Canada** are administering $14 million in investments to the Mi'kmaw Home Energy Efficiency Project to upgrade 80 per cent of the 2,400 band-owned homes on reserves over ten years, targeting 900 homes in the first four years. Upgrades can include new insulation, heat pumps, and draft-proofing.

Governments also continued to use interties as a way to facilitate the transmission of clean energy and electricity between jurisdictions. Manitoba and Saskatchewan finalized a contract for more baseload renewable energy to begin flowing between their respective provinces in 2022. New Brunswick and Québec signed three agreements to facilitate the transmission of energy between the two provinces, and work was done to modernize electricity systems through grid upgrades, R&D on smart grid technologies, and microgrid uptake.

Nunavut is developing community energy plans with four Nunavut communities to assess community energy needs and prioritize future clean energy projects. Funding has been extended due to delays of doing community driven work brought on by COVID-19, however, plans for Coral Harbour and Naujaat are expected to be completed within the next two years.

Remote communities not connected to the North American electricity grid rely on costly and GHG-emitting diesel-generated electricity. Investing in clean energy solutions to reduce reliance on diesel is an important link to energy security, reconciliation and self-determination for Indigenous peoples. Governments continued to invest in the off-diesel transition, through investing in clean energy in remote and northern communities and improving energy security. In the Northwest Territories and Yukon, investing in clean energy was done through programs like Northern REACHE, the Clean Energy for Rural and Remote Communities Program, Impact Canada's Indigenous Off-Diesel Initiative, and the Investing in Canada Infrastructure Plan. This federal programming also allowed Nunavut to develop Community Energy Plans, and the Wataynikaneyap Power project to connect 16 remote First Nations to Ontario's low-carbon grid while British Columbia has invested in a similar manner though their CleanBC Remote Community Energy Strategy.

Built Environment

The transition toward powering and heating buildings with renewable energy and increasing energy efficiency continued in 2020. Reducing energy demand by increasing new and existing buildings' energy efficiency has proven to be effective to accelerate this transition. Governments remain committed to improve their construction codes to make new and existing buildings more energy efficient. Some jurisdictions are also delivering new construction and retrofit incentive programs. Measures under the PCF also target energy efficiency improvements for appliances and equipment, as well as in Indigenous communities.

In 2020, Canada launched a process to publish a more stringent model energy code (National Building Code and National Energy Code for Buildings 2020) for new houses and buildings and announced $2 billion through the Canada Infrastructure Bank Growth Plan to improve the energy efficiency of existing commercial and large scale buildings. In July 2020, Ontario updated its energy efficiency regulation to harmonize efficiency requirements for nine fuel-burning products with federal requirements, and to increase efficiency requirements for residential windows. British Columbia launched the CleanBC Better Homes New Construction program in December 2020 to improve the energy efficiency of new construction projects.

Under the first intake of the CleanBC Communities Fund, **Canada** and **British Columbia** approved nearly $55 million in funding for 16 projects, committed $8 million to projects awaiting final approval, and launched a second call for project applications. The projects support energy-efficiency building upgrades, clean energy, and clean transportation initiatives.

Prince Edward Island expanded its suite of energy efficiency programs, in partnership with Canada's Low Carbon Economy Fund, including installing heat pumps to reduce emissions, fuel switching home heating systems from light fuel oil to biomass heating, and improving efficiency in non-residential buildings through the Community Energy Solutions Program.

Québec updated its Construction Code for large buildings in 2020, and announced $453 million for energy efficiency and energy transition for existing buildings. In New Brunswick, the Total Home Energy Savings program continued offering incentives to support home energy efficiency improvements – supporting nearly 3000 upgrades in 2020. Nova Scotia and Canada continued administering $14 million in investments to the Mi'kmaw Home Energy Efficiency Project, which will see all band-owned homes on reserves qualify for upgrades like new insulation, heat pumps, and draft-proofing.

Transportation

In 2018, GHG emissions stemming from the transportation sector accounted for 30 per cent of Canada's total CO_2 equivalent emissions.[23] Governments remain committed to create a clean and efficient transport network across Canada. In 2020, jurisdictions continued to make efforts to reduce GHG emissions, through more stringent regulations on vehicles and encouraging a transition toward zero-emission vehicles, low carbon fuels, and lower emitting transportation modes.

23 National Inventory Report, 2020

Newfoundland Power filed an application with the Public Utilities Board to spend $20 million between 2021-2025 on electric vehicle charging infrastructure (including 29 fast charging stations) and purchase incentives. Renewable electricity demand is projected at 22 GWh by 2025.

Nova Scotia has invested in Halifax Regional Centre All Ages and Abilities Bikeway Network Project in partnership with Halifax and the Government of Canada. The project will complete a 30 km network of bicycle routes, focused on Halifax's downtown core, to provide residents safer and more flexible transportation options.

Canada's *A Healthy Environment and a Healthy Economy* climate plan commits Canada to align its vehicle emissions standards with the most stringent standards at the U.S. federal or state level for the post-2025 time period.
In October 2020, the Canada Infrastructure Bank announced $1.5 billion to accelerate the adoption of zero-emission buses and charging infrastructure. Québec announced $626.5 million for zero-emission buses and $174 million for charging infrastructure as part its 2030 PGE. In December 2020, Canada announced the implementation of the *Off-Road Compression-Ignition (Mobile and Stationary)* and *Large Spark-Ignition Engine Emission Regulations* for new equipment such as forklifts and stationary diesel generators that are often used to power remote communities. Also, on December 19, 2020, the proposed Clean Fuel Regulation was published in the Canada Gazette, Part I, which would require a carbon intensity reduction of liquid fuels produced and imported into Canada. Québec's draft regulation on the minimum volume of renewable fuel in gasoline and diesel fuel underwent amendments in 2020. The regulation is intended to set standards for the blending of renewable fuel into gasoline and diesel fuel. In 2019, Emissions Reduction Alberta launched the Biotechnology, Electricity, and Sustainable Transportation (BEST) Challenge and committed approximately $26 million to novel sustainable transportation projects valued at over $72 million.

In July 2020, British Columbia passed the *Zero-Emission Vehicle Regulation* bringing into force requirements on automakers to meet zero-emission vehicles sales targets starting in 2020, reaching 10 per cent of light-duty vehicle sales by 2025, 30 per cent by 2030, and 100 per cent by 2040. In 2020, Québec prepared a report on the implementation of the ZEV standard, and work is underway to strengthen this standard over the coming years. Québec has announced that the targets for the sale of ZEV motor vehicles will be 30 per cent in 2030 and 100 per cent in 2035. Also, Québec announced the

As part of StrongerBC, **British Columbia's** CleanBC Go Electric Specialty Use Vehicle Incentive (SUVI Program) provided $31 million to support the adoption of specialty-use zero-emissions vehicles that are not included in the province's rebate program, including motorcycles, low-speed vehicles, electric cargo bicycles and utility vehicles.

extension of the Electric School Bus Deployment Support Program from June 30, 2020 to March 31, 2021. In October 2020, Ontario announced that it is matching a $295 million investment with the federal government to retool Ford Motors Oakville Assembly Complex into a global hub for battery electric vehicle production. In 2020, Prince Edward Island's Active Transportation Fund supported 22 different projects that helped to better connect existing walking and cycling trails.

The goal of **Quebec's** 2030 Plan for a Green Economy is the electrification of the transportation sector, with emphasis on public transit, light and heavy vehicles, specialized trucks and the deployment of charging infrastructure. To achieve these ambitious transportation objectives, the government has announced investments of $3.6 billion in the transportation sector, including electrification.

The CleanBC Industry Fund invests in GHG-reducing projects and increases opportunities for innovative clean technologies. The 2020 CleanBC Industry Fund is investing approximately $33 million in carbon tax revenue in 22 emission-reduction projects, with industry and partners contributing an additional $51 million.

Industry

Canada's industrial sector, encompassing several sectors including manufacturing, oil and gas, and mining, is a major economic contributor. However, it is also a substantial source of GHG emissions in Canada, with the oil and gas and heavy industry sectors making up approximately 37 per cent of Canada's emissions in 2018.[24] In the PCF, governments committed to improving industrial energy efficiency, investing in research and development for technologies that reduce emissions, reducing methane emissions from the oil and gas sector, and phasing down the use of hydrofluorocarbons (HFCs).

Governments implemented and updated key regulations related to methane and HFC emissions. Methane is a potent GHG with a global warming potential of about 25 times that of carbon dioxide. The first set of requirements under the national methane regulations for the oil and gas sector came into force on January 1, 2020. Equivalency agreements were reached with the provinces of British Columbia, Alberta, and Saskatchewan in 2020. These regulations aim to meet 2025 emissions reductions targets of 45 per cent below 2012 and 2014 levels, respectively. The Government of Canada launched the $750 million Emissions Reductions Fund in response to the COVID-19 pandemic, which will help onshore and offshore oil and gas companies and Canadian innovators by providing funds to invest in green solutions to reduce GHGs (mainly methane), and retain jobs in the sector.

24 https://publications.gc.ca/collections/collection_2020/eccc/En81-4-2018-1-eng.pdf

Alberta's *Methane Emission Reduction Regulation* came into effect in January 2020 and introduced key updates to methane regulation directives, alongside announcements of investments of $25 million to support industry install methane-related emissions reduction equipment and $27 million to conduct detailed assessments of methane reduction opportunities and fugitive emissions.

Efforts to improve industrial energy efficiency continued in 2020. Canada furthered its support for industrial decarbonization through the announcement of the Net-Zero Challenge for large emitters and the provision of $3 billion to the Strategic Innovation Fund's new Net-Zero Accelerator to expedite decarbonization projects with large emitters, scale up clean technology and accelerate Canada's industrial transformation across all sectors. Provinces also continued to focus on initiatives to reduce industrial emissions. Alberta announced $55 million through the Energy Savings for Business program to help small- and medium-sized facilities benefit from emissions-reducing industrial and commercial projects. Québec announced $670 million to support energy efficiency and conversion, as well as process optimization in businesses, which includes $90 million for a GHG challenge for large industrial emitters. Other examples include British Columbia's Technology and Innovation Policy Framework and CleanBC Program for Industry, Newfoundland and Labrador's *Management of Greenhouse Gas Act*, and the Buildings and Industry component of the Northwest Territories' Greenhouse Grant Program. Canada, British Columbia, and New Brunswick continued to fund programs related to energy management systems.

Approximately half of GHG emissions in **Newfoundland and Labrador** stem from large industry. These emissions were subject to a reduction target of 8 per cent below historical baselines in 2020, equivalent to 317,000 tonnes. Reported GHG reductions totaled 973,000 tonnes. The reduction target increases to 10 per cent below baseline in 2021.

In 2020, governments continued to invest in new technologies to advance innovation in emissions reductions across Canada's industrial sector. In addition to leading research projects to promote the adoption of clean technologies across several modes of transportation, Canada announced an investment of $1.5 billion in a Clean Fuels Fund[25] to increase the production and use of low-carbon fuels. Three programs for the reclamation of oil and gas sites were established by British Columbia, which are receiving up to $120 million in total federal funding. Canada announced it would develop a comprehensive carbon capture, use and storage strategy. Alberta also announced a $100 million investment in the Industrial Energy Efficiency and Carbon Capture Utilization and Storage Grant Program as a part of the Technology Innovation and Emissions Reduction (TIER) Fund. The Alberta Petrochemicals Incentive Program was also launched in 2020 as part of Alberta's Recovery Plan; the 10-year program provides grants to support investment in new or expanded facilities including clean hydrogen, carbon capture and other operations.

25 Initially announced in the SCP as the Low-Carbon and Zero-emissions Fuels Fund, the initiative was renamed to the Clean Fuels Fund in 2021.

Forestry, Agriculture, and Waste

There is continued interest in maximizing the potential to both enhance carbon sinks and reduce GHG emissions from land and waste management. While agriculture and waste together made up approximately 16 per cent of Canada's GHG emissions in 2018, forests, wetlands, and agricultural lands can also play an important role by storing and absorbing atmospheric carbon.[26] Acknowledging these opportunities, governments continued to take a variety of actions to decrease GHG emissions and enhance sequestration from the forest, agriculture, and waste sectors.

Ontario shared a discussion paper proposing to make it easier and faster for farmers to expand in the emerging renewable natural gas market in Ontario. These changes were proposed to encourage the recycling of nutrients to generate clean energy, encourage sustainable agriculture, and help promote new economic development opportunities.

Governments invested in research projects and programs related to land-based climate mitigation, such as forest growth and reforestation, soil sequestration, and sustainable agricultural practices. Canada allocated $3.9 billion to the new Natural Climate Solutions Fund, which aims to increase carbon sequestration with various co-benefits by expanding Canada's natural assets, including planting 2 billion trees over the next decade. This includes an additional $98.4 million investment to establish an Agricultural Climate Solutions program. Furthermore, collaboration with provinces and territories has been key to advancing innovation projects. To highlight a few examples, British Columbia, Alberta, Manitoba, and Québec all continued funding and implementing programs and projects in areas including carbon sinks and sequestration, reforestation and forest growth, addressing mountain pine beetle infestations, protecting caribou populations and habitats, and silviculture. Alberta established its carbon offset proposal for Biogas Production and Combustion in 2020. Québec released their Wood Production Strategy, in partnership with Indigenous communities and other stakeholders, and announced new funding of $82.2 million over 6 years for additional silviculture to sequester carbon. Atlantic Provinces continued an early intervention strategy to control spruce budworm outbreaks, to address associated GHG emissions from forest-level defoliation and dying trees. Governments also took action to continue the promotion of the use of wood for construction, through support for forestry-oriented strategies and programs such as British Columbia's Office of Mass Timber Implementation, Ontario's Forest Sector Strategy, and New Brunswick's Wood in Construction of Public Buildings Policy.

Canada has a large supply of sustainably managed forest biomass, as well as ample access to forest industry by-products and residues. As of 2018, biomass is the second largest source of renewable energy in Canada after hydroelectricity.[27] In 2020, biomass energy projects came online and continued operating across the country, such as projects from LaFarge Cement and Tolko Industries in Alberta. Governments promoted the use of bioproducts and biofuels in various industries and sectors through supporting initiatives and programs including Canada's $220 million Clean Energy for Remote and Rural Communities Program and Yukon's interdepartmental working group on

26 https://publications.gc.ca/collections/collection_2020/eccc/En81-4-2018-1-eng.pdf

27 https://www.nrcan.gc.ca/science-and-data/data-and-analysis/energy-data-and-analysis/energy-facts/renewable-energy-facts/20069

harvesting and biomass supply opportunities and the Yukon Biomass Energy Strategy. To support use of available forest biomass and mill by-products, Ontario began to develop a draft Forest Biomass Action Plan in 2020 aimed at supporting job creation, economic development and a sustainable forest sector. The province's renewable forest biomass value chain is poised to grow further following the initiation of several biochar and pulp projects. Québec continued implementation of the 2018-2023 Development Strategy for Québec's Forest Products Industry and continued providing support for programs and initiatives to promote and increase the use of biofuels and biomass.

Federal, provincial, and territorial governments also worked to advance innovation in GHG-reducing projects through Canadian Agricultural Partnership funding programs. Prince Edward Island's Federation of Agriculture and Saskatchewan's Forest Management Planning system supported GHG-efficient management practices to reduce emissions and increase carbon storage in their agricultural and forestry sectors. Canada and British Columbia made investments to promote beneficial management practices (BMPs). Governments continued to implement programs to promote sustainability and innovation in the agricultural industry, including Manitoba's Ag Action Research and Innovation Activity, Ontario's AgriSuite greenhouse gas calculator, and Canada's Agricultural Greenhouse Gases and Agricultural Clean Technology programs. New Brunswick and Newfoundland and Labrador also funded agriculture-related research initiatives with climate change mitigation potential.

In order to reduce waste, some jurisdictions have been diverting organic waste from landfills to produce bio-energy and bio fuels. British Columbia's Organics Infrastructure Program, with funding support from the federal Low Carbon Economy Leadership Fund, facilitates the investment of $30 million towards organics processing infrastructures such as composting facilities or anaerobic digesters, and in 2020 13 new projects were announced and funded for a total investment of $5.4 million. Enerkem's facility in Edmonton, Alberta continues as the first operation in the world to produce renewable methanol and ethanol from non-recyclable, non-compostable municipal solid waste at commercial scale, reducing emissions by diverting waste that would otherwise be landfilled. Ontario posted proposed regulatory changes that would make it easier for farmers to establish on-farm renewable natural gas-generating anaerobic digesters which would encourage the recycling of nutrients to generate clean energy.

Government Leadership

In 2020, several governments released new climate plans, and updated their emissions reduction targets. Implementation of British Columbia's climate plan, CleanBC, continued through 2020 and, in December 2020, the province set a new near-term interim emission target for 2025 of 16 per cent below 2007 levels. In September, the Yukon released *Our Clean Future: A Yukon strategy for climate change, energy and a green economy* that sets the territory's climate change priorities for the next 10 years. In Québec, the 2030 PGE has become the province's first framework policy on climate change. It will guide the provincial government's actions over the next ten years. The 2030 PGE will allow Québec to ramp up its climate action in the vast majority of the sectors covered by the PCF. Québec also adopted *An Act mainly to ensure effective governance of the fight against climate change and to promote electrification* which revamps Québec's governance structure in terms of the fight against climate change.

Canada introduced the *Canadian Net-Zero Emissions Accountability Act* in November 2020. The purpose of the Act is to require the setting of national targets for the reduction of greenhouse gas emissions based on the best scientific information available, and to promote transparency and accountability in achieving those targets, in support of achieving net-zero emissions in Canada by 2050, and Canada's international commitments for mitigating climate change. On December 11, 2020, the Government of Canada released *A Healthy Environment and A Healthy Economy* as a federal plan to cut pollution and build a stronger, cleaner, more resilient and inclusive economy. Additional details on these plans and targets can be found in the ***Cross Cutting*** section of the Annex.

In the PCF, governments committed to demonstrate leadership through setting clear and ambitious targets to reduce GHG emissions from government operations, along with tangible plans to achieve them, to demonstrate that they are taking action and encourage other sectors to do the same.

In September, **Yukon** released *Our Clean Future: A Yukon strategy for climate change, energy and a green economy*, which includes 131 actions that will address the impacts of climate change while building a green economy and ensuring Yukoners can access reliable, affordable and renewable energy over the next decade.

New Brunswick invested $4.6 million in government energy efficiency programs in 2020-2021 with an additional $2 million federal investment under the Climate Action Incentive Program. Forty-six building retrofit projects were completed with Departments of Health; Education and Early Childhood Development; Transportation and Infrastructure and Community Colleges.

Québec launched its *2030 Plan for a Green Economy*, and an implementation plan for 2021–2026, with a budget of $6.7 billion over five years. The 2030 PGE commits to reducing GHG emissions by 37.5% below 1990 levels by 2030 and sets a trajectory towards carbon neutrality by 2050.

In 2020, governments continued to find ways to cut emissions from public buildings and fleets, such as connecting facilities to clean energy sources, funding energy efficiency programs for public buildings, reducing or greening fleets, and updating government policies/strategies. For example, Canada announced in November 2020 an updated Greening Government Strategy that would take actions to transition to net-zero

In December, **Canada** released a strengthened climate plan, *A Healthy Environment and A Healthy Economy*, with $15 billion in new investments to meet and exceed the national GHG reduction target for 2030. In 2020, the national target was to reduce emissions by 30 per cent below 2005 levels, by 2030.

In October 2020, **Prince Edward Island** committed to achieving a net-zero energy supply by 2030, and released a proposed framework to achieve net-zero emissions by 2040. This represents the most aggressive GHG emissions reduction target in Canada. Prince Edward Island also legislated its 2040 target in December 2020.

carbon and climate-resilient government operations, while also reducing environmental impacts beyond carbon, including on waste, water and biodiversity. British Columbia achieved carbon neutrality across its public sector organizations in 2020, marking its 10th anniversary of Carbon Neutral Government. In 2020, British Columbia also announced $50 million in funding to the Carbon Neutral Capital Program to reduce emissions and create additional savings from energy efficiencies. Saskatchewan and Manitoba both reduced their vehicle fleets, and New Brunswick invested $6.6 million in new energy efficiency programs for government operations, which included $2 million from the federal government's Climate Action Incentive Fund. Québec's 2030 PGE outlined numerous government-wide goals including electrifying government fleets and a 60% reduction in the carbon footprint of government buildings below 1990 levels.

International Leadership

Many international partners are working to reduce global emissions and jurisdictions have determined, under the PCF, specific areas to achieve this objective. By the end of 2020, Canada had announced more than $2 billion worth of initiatives as part of its $2.5 billion five-year climate finance commitment, to help developing countries transition to low-carbon and climate-resilient economies, as well as to mobilize private sector investments for climate action. Provinces and territories also supported a wide variety of development projects that address climate change and are playing an increasingly important role in sustained and scaled-up climate finance flows. For example, Québec invested nearly $9.5 million in the most vulnerable French-speaking countries to contribute to communities' efforts to reduce GHG emissions and adapt to the impacts of climate change.

The PCF prioritizes action to reduce emissions within Canada, but also recognizes that international carbon markets could complement domestic efforts and contribute to sustainable development abroad. Canada continues to explore how Internationally Transferred Mitigation Outcomes (ITMOs) under Article 6 of the Paris Agreement could help achieve national climate targets.

The Western Climate Initiative (WCI) is a robust carbon pollution pricing instrument that has helped both Québec and California realize significant emissions reductions. The two jurisdictions

are currently developing an accounting framework under the WCI to calculate how to allocate the net flow of emission reductions between them. The federal government continues to work with Québec to understand the methodology underpinning the accounting framework and explore how the net flow of emissions reductions could form the basis of an ITMO.

In 2020, governments also demonstrated leadership with continued engagement in trade and climate policy. Canada participated in various meetings to raise global ambition on climate change, biodiversity, clean energy, and other issues, including the G20 Environment Ministers Meeting on September 16, 2020, the G20 Energy Ministers' Meeting on September 26-27, 2020, and the G20 Leader Summit on November 21-22, 2020. At the International Energy Agency's inaugural Clean Energy Transitions Summit on July 9-10, 2020, Canada built strong multilateral support for an inclusive economic recovery from COVID-19 that accelerates progress on Paris Agreement targets and net zero emissions commitments. At the 11th Clean Energy Ministerial on September 22, 2020, Canada continued to put its leadership into practice by launching two collaborative initiatives, the Global Commercial Vehicle Drive to Zero campaign to promote zero emissions commercial vehicles and the Biofuture Platform to grow the global bioeconomy. Canada continued actively participating in bilateral and multilateral trade and climate policy meetings and negotiations such as the United Nations' high-level roundtable on climate ambition and the UN Biodiversity Summit. In 2020, Canada also co-convened with the United Kingdom several high-level virtual events of the Powering Past Coal Alliance, growing the coalition to over 100 members and continuing to drive global efforts to end emissions from coal-fired power plants.

Manitoba and Ontario continued to provide input into federal efforts to include references to climate change in international trade negotiations. In 2020, the Government of the Northwest Territories continued activities as a signatory of the Under2 Coalition and provided input to the Carbon Disclosure Project. Northwest Territories also participated at the United Nations Environment Assembly information gathering meeting on Nature Based Solutions.

4.0 Adaptation

Canadians are seeing the consequences of climate change first-hand through an increase in extreme weather events resulting in flooding and wildfires, as well as slow-onset changes, such as sea-level rise. In its 2019 report Canada's *Top Climate Change Risks*[28], the Council of Canadian Academies (CCA) provided a comprehensive overview of climate risks in Canada. Based on the extent and likelihood of potential damage, the CCA identified physical infrastructure, coastal and northern communities, human health and wellness, ecosystems and fisheries as the top six areas affected by climate change. Other major risk areas identified include agriculture and food, forestry, water, governance capacity and geopolitical dynamics. Importantly, the report also recognized the severe impacts of climate change on Indigenous Peoples' ways of life.

Climate impacts are not confined to a single sector or jurisdiction, and building resilience requires whole-of-society efforts, including action from across federal, provincial and territorial governments. Adaptation is a high priority for all orders of government, and has been a strong area of collaboration. Effort is under way across the country, in partnership with municipalities, Indigenous communities, the private sector, academia, and non-governmental organizations, to adapt to the impacts of climate change.

In December 2020, the federal government announced its intention to develop **Canada's** first National Adaptation Strategy. The Strategy would establish a shared vision for climate resilience in Canada, identify key priorities for increased collaboration, and establish a framework for measuring progress at the national level.

28 https://cca-reports.ca/wp-content/uploads/2019/07/Report-Canada-top-climate-change-risks.pdf

The development of the PCF was an important advancement towards collaborating on adaptation action across jurisdictions. Under the Adaptation and Climate Resilience pillar of the PCF, governments committed to implement actions to share knowledge, build capacity and invest in on-the-ground adaptation projects.

Translating Science and Traditional Knowledge Into Action

Scientific information and Traditional Knowledge are pivotal to our ability to be resilient to the potential impacts of climate change. Authoritative information and data help better model and project climate impacts and provides decision makers, communities and individuals with higher quality information on which to base adaptation actions. It is similarly important to build capacity to translate that information and data into concrete action by building platforms and offering training and skills development.

Ontario launched a provincial-level, multi-sector climate change impact assessment to evaluate how climate change is expected to impact the province by region and key areas of focus including infrastructure, food and agriculture, people and communities, natural resources, ecosystems and the environment, and business and the economy.

A number of initiatives have been implemented to support the provision of climate change science, and to inform concrete action. Federal, provincial, and territorial governments, National Indigenous Organizations, and others worked together to develop *Climate Science 2050: Advancing Science and Knowledge* on Climate Change, a national synthesis report that was undertaken to better understand the breadth of climate change science and knowledge needs that exist in Canada. The federal Indigenous Community-Based Climate Monitoring Program also continued to support Indigenous-led, self-determined projects to monitor climate impacts, build capacity, and inform local and regional adaptation activities.

Yukon launched a Youth Panel on Climate Change and, in 2020, the Panel worked hard to develop recommendations on how government can accelerate work on climate action. The Panel met with elected officials, engaged with young people across Yukon, and worked with the Yukon First Nations Climate Fellows.

To ensure the best available climate science and knowledge is shared broadly with Canadians, federal, provincial, and territorial governments advanced work to develop regional climate organizations. This included work to build support and plan for a northern climate organization, the establishment of ClimateWest (a new climate organization in the Prairie provinces), and inviting organizations to apply to serve as the regional climate services organization in Atlantic Canada. This work was complemented by the addition of new climate information, tools and products on ClimateData.ca, a collaborative climate data portal supported by the Canadian Centre for Climate Services (CCCS) and the network of regional

Yukon launched a territory-wide climate change risk assessment to understand climate resilience, assess where community strengths and capacity exist, and how climate change will impact people and communities. This assessment mobilized both science and Indigenous knowledge. The results will inform adaptation decisions and help inform First Nations' and communities' planning.

organizations. A central repository of climate resilient codes and standards documents was added to the CCCS website. The CCCS also advanced the development of an interactive map of Canadian climate adaptation examples to support decision-making in this space. Canada also committed to develop the country's first National Adaptation Strategy with provincial, territorial and municipal governments, Indigenous Peoples, and other key partners.

With its 2030 PGE, Québec has begun a process of structured adaptation, focusing on prevention and consideration of the future climate, by targeting the major risks that Québec is already facing or could face. Québec's climate transition will be based on science. For that reason, Québec has announced investments of nearly $40 million in the development of adaptation knowledge. The government will also continue to support the work of the Ouranos consortium, which plays an important role in this area. To build capacity, provinces and key stakeholders continued to implement projects under the federal Building Regional Adaptation Capacity and Expertise program, delivering various learning activities such as training, internship programs, workshops, webinars, and creating networks. Canada and Québec also provided funding for a new climate change adaptation training program for urban planners, architects and engineers. Ontario launched its first multi-sectoral provincial climate change impact assessment. The study will use the best available science and information to better understand where and how climate change is likely to affect areas including infrastructure, food and agriculture, people and communities, natural resources, ecosystems and the environment, and business and the economy.

Canada, through its Building Regional Adaptation Capacity and Expertise (BRACE) program, supported or partnered in supporting capacity-building efforts in 6 Canadian provinces. Recipients included universities, provincial governments (and a provincial government agency), an industry group, and a communication network for location-specific environmental organizations.

Building Climate Resilience Through Infrastructure

Infrastructure, such as our buildings and roads, is vulnerable to climate-related hazards, including extreme precipitation and storms, flooding, wildfires, coastal erosion, and permafrost degradation. Recent disasters have caused billions of dollars in infrastructure damages, threatening human health and economic opportunities such as trade. Integrating climate considerations into

infrastructure design and development will ensure that new and existing infrastructure can withstand climate impacts, protect the health and safety of Canadians, and result in long-term cost savings.

Action to advance resilient infrastructure has continued. New building and construction codes and standards have been developed to make buildings, bridges, roads, transit, water, and wastewater infrastructure more climate-resilient. Through the Canadian Council of Ministers of the Environment (CCME), work progressed on a framework to facilitate a common understanding of key natural infrastructure terms and concepts. Direct on-the-ground projects across the country, including those funded through the Disaster Mitigation and Adaptation Fund (DMAF), will help ensure that infrastructure will be resilient to a range of impacts, including wildfires and flooding. For example, Alberta and Canada announced funding for two projects in Calgary intended to make the community more resilient to the effects of flooding. Saskatchewan announced $85 million to reduce the impacts of wildfires in northern communities and support municipalities with emergency preparedness planning. In Québec, the third and final call for projects under the *Programme de soutien aux municipalités dans la mise en place d'infrastructures de gestion durable des eaux de pluie à la source*, which aims to help municipalities implement sustainable rainwater collection infrastructure, ended on September 11, 2020, with a budget of $10 million. The selected projects join the 16 other projects that have been supported to date.

In fall 2020, **Alberta** undertook 10 high-priority flood mitigation projects by investing $45 million to improve existing infrastructure. The province also created the Climate Adaptation Program, providing municipalities and Indigenous communities $4.5 million through an innovation and emissions reduction fund to take steps to build their adaptive capacity and adapt.

Manitoba continued consultation and engagement with 39 Indigenous communities and groups on construction of the Lake Manitoba and Lake St. Martin outlet channels in 2020. This $540 million multi-community flood protection enhancement project will help to strengthen Manitoba's network of flood mitigation infrastructure, and detailed design work for both project components is underway.

Protecting and Improving Human Health and Well-Being

Climate change is affecting the physical and mental health and well-being of Canadians. Threats to human health can occur through extreme heat events, the increased presence of infectious diseases and pests, and reduced access to traditional foods. The need to build resilience in human health has been underlined by the COVID-19 pandemic that has disproportionately affected the elderly, the young, those with chronic physical and mental illness, and the economically disadvantaged.

Saskatchewan released its second annual Climate Resilience Report as part of the province's Climate Resilience Measurement Framework that examines resilience to climate impacts. Four measures are used as indicators of human wellbeing and resilience, and the 2020 Climate Resilience Report demonstrated all four human well-being measures were meeting the Framework's targets.

Initiatives are underway across the country to reduce harmful impacts of climate change to human health and wellbeing. Health Regions across the country have developed and delivered Heat Alert and Response Systems to prepare and plan for extreme heat and address community-specific needs. The HealthADAPT capacity building program continues to help the health sector prepare for and respond to the impacts of climate change. Until March 31, 2022, the HealthADAPT program will be investing a total of $3 million in partnerships with 10 health authorities across 5 provinces and territories. The funding is to support their climate change and health efforts. In 2020, Canada advanced adaptation efforts by public health officials and individuals through the development and sharing of risk communications, maps and models, surveillance reports and monitoring activities, knowledge synthesis and education and awareness tools on ways to prevent and control identified infectious disease risks, with a focus on tick-borne and mosquito-borne diseases. The federal Infectious Disease and Climate Change Fund invested in ten projects totalling $2.7 million, with 31 projects now up and running since its 2017 launch. Three of the ten projects funded in 2020 help to advance work under the Federal Framework on Lyme disease and Action Plan by raising awareness among youth and investigating new and emerging tick species. Additionally, these new projects will investigate, analyze, and improve knowledge gaps related to climate-driven food-borne, water-borne, and zoonotic diseases. Newfoundland and Labrador implemented a pilot project to determine the environmental burden of Lyme disease. In addition, recognizing the effects of climate change on access to traditional foods, Yukon delivered two projects to understand how communities are adapting to changes in traditional diets. Québec's healthcare network, through the participation of the *Institut national de santé publique du Québec* and 13 public health departments, has developed a regional assessment process for determining health-related climate change vulnerabilities. Multiple federal, provincial, and municipal partners collaborated on these projects.

Manitoba's winter road system is affected by climate change and is a lifeline for many northern residents. Manitoba committed to investing $9 million to connect 22 northern communities to the road system, and providing access to supplies, essential goods and services.

Supporting Particularly Vulnerable Regions

Some regions face disproportionate impacts from climate change due to a range of geographic, social, political, environmental, and economic factors. Canada's North is seeing unique impacts from climate change, including on traditional food sources, melting ice, thawing permafrost, and disruptions to transportation services. Other vulnerable regions include areas such as isolated coastal locations that are susceptible to extreme weather, flooding and coastal erosion. Such impacts result in significant damages to ecosystems and livelihoods.

The federal, provincial, and territorial governments have taken action to build resilience in northern, Indigenous, and coastal communities. Canada's Northern Transportation Adaptation Initiative administered 11 projects that will develop knowledge about how climate change is affecting northern transportation systems and build capacity to respond to these challenges. The federal Climate Change Preparedness in the North Program supported community implementation of projects that built regional knowledge and capacity, and addressed adaptation needs. Canada's Aquatic Climate Change Adaptation Services Program funded ocean monitoring in all three of Canada's oceans, six joint projects under the ongoing Fisheries and Oceans Canada - US National Oceanic and Atmospheric Administration (NOAA) Ocean Acidification Collaboration, and 15 research projects to better understand and forecast changing ocean conditions and impacts on ecosystems, fisheries, and coastal infrastructure. Five projects with Métis Nation organizations were also advanced, with agreements in place with the Métis National Council, Métis Nation of Saskatchewan, Métis Nation of Ontario, Manitoba Métis Federation and Métis Nation of Alberta to advance action on climate change and health. The Northwest Territories conducted a high-level risk assessment of climate impacts on infrastructure in communities. The Northwest Territories have also been developing a Climate Change Adaptation Strategy for Wildlife Management, which will set overall goals and an approach to guide current and new wildlife management actions based on priorities outlined by Indigenous governments/ organizations and other management authorities. Alberta continued its development of an

The **Northwest Territories** Climate Change Council was launched to bring together Indigenous governments and organizations, communities, the Government of the Northwest Territories (GNWT), and external partners. The Council will provide guidance and advice on GNWT climate change and environment programs in alignment with Indigenous and community perspectives, interests, and knowledge.

New Brunswick produced the *Sea-Level Rise and Flooding Estimates for New Brunswick Coastal Sections 2020* report, providing the latest projections of worst-case scenario coastal flooding elevations. All coastal high-risk municipalities have completed Climate Change Adaptation Plans identifying community vulnerabilities, areas at risk of flooding and erosion, and recommended adaptation measures.

Indigenous Climate Change Observation Network, ensuring that Indigenous knowledge holders and scientists could share knowledge of climate change, and created the Climate Adaptation Program, providing TIER funding of $4.5 million to help municipalities and Indigenous communities to learn about climate adaptation, assess their vulnerability, and build climate adaptation plans. Nova Scotia supported increased resilience in coastal communities by continuing the development of regulations required to implement the *Coastal Protection Act*, which will include vertical and horizontal building setbacks for coastal areas and restrictions on structures that interfere with coastal ecosystems. Québec improved permafrost mapping and assessed its sensitivity to thaw in order to plan sustainable development for each of the 13 northern villages built on permafrost. Construction potential maps were developed to guide the villages' expansion, factoring in development constraints and the geotechnical characteristics of the permafrost.

Nunavut, in collaboration with **Canada**, revitalized its Long-Term Permafrost Monitoring Program. This program depicts long-term permafrost trends in approximately half the communities in Nunavut. It is used to better understand local rates of permafrost change and inform decision making for local infrastructure design, adaptation, and maintenance in a changing climate.

Reducing Climate-Related Hazards and Disaster Risks

Extreme weather events such as flooding and wildfires and slow onset changes that affect infrastructure, ecosystems and human health are growing in frequency and significance. Among these impacts include flooding, drought, extreme heat, longer fire seasons and more severe forest fires, high winds and winter road failures. To mitigate the social and economic costs of these impacts, governments implemented projects related to risk assessments, disaster risk reduction and emergency management.

Canada worked with provinces and territories through the Canadian Council of Ministers of the Environment to develop guidance for conducting climate change risk assessments across jurisdictions. Prince Edward Island, Ontario, and Newfoundland and Labrador launched province-wide climate change risk assessments, and some developed adaptation strategies. Similarly, Nova Scotia continues to develop its own province-wide risk assessment. Federal, provincial, territorial governments, industry, and Indigenous communities helped establish a task force to develop options for a national high-risk flood insurance program and national action plan on relocation and participants from across Canada met to address standardization of the Federal Flood Mapping Guidelines Series in Canada. Canada and the provinces and territories continued to develop a joint Action Plan for the Emergency Management Strategy for Canada while Ontario and Québec have published region-specific plans to strengthen resilience to flooding. Ontario released its provincial Flooding Strategy in March 2020, outlining over 90 actions to strengthen resiliency to flooding and help Ontarians better prepared for flood events. The Flooding Strategy also highlighted actions to support local flood mitigation measures, flood mapping and flood risk assessment tools. Canada continued supporting Regional Integrated Assessment hubs to explore the effects of climate change on forested landscapes and develop responses to climate change impacts in forested communities. British Columbia's Community Resiliency Investment Program provided approximately $13 million to help local governments and First Nations reduce wildfire threats around their communities.

5.0 Clean Technology, Innovation, and Jobs

Clean technology innovation is critical to achieving our emissions reduction objectives and at the same time offers enormous potential for Canada and the world. The World Economic Forum has estimated that opportunities arising from clean tech innovation in areas such as food, energy, and the urban and built environment will amount to $10.1 trillion in global annual business value and the creation of 395 million jobs by 2030.[29] Canadians have the opportunity to build on our strengths as innovators and producers of clean technology solutions to help Canada transition to a resilient and prosperous clean growth economy.

Canada's environmental and clean technology sector, excluding waste management and electricity production, employed over 206,000 people in 2018. In the same year, Canadian clean technology exports totaled $12 billion, a 2 per cent increase over the previous year, and contributed $67.1 billion to Canada's gross domestic product, representing an increase of 3.3 percent from 2017.[30]

Governments across Canada have been strengthening codes, standards, and regulations and have been delivering programs to support the development and incentivize the adoption of innovative clean technologies. These actions are supporting new jobs and opportunities for Canadian businesses by helping to lower costs through improved energy and resource efficiency and are helping meet environmental objectives through emissions reductions and other environmental benefits.

29 New Nature Economy Report II: The Future of Nature and Business. (link)

30 More information available here.

The Canadian Emission Reduction Innovation Network (CERIN) announced projects selected for funding from their 2019 call for proposals. CERIN is jointly supported by **Alberta** and **Canada** with funding of up to $15.5 million to support clean technology development, to reduce methane emissions and short-lived climate pollutants from the oil and gas sector.

Building Early-Stage Innovation

Research activities are foundational to Canada's success as an innovator and clean technology producer and adopter. Canada is a globally recognized research leader, with a strong innovation environment. Government support, through direct funding, tax credits, and research infrastructure, has been critical to the development of Canada's research strengths. Governments have continued to conduct and support mission-oriented research and development programs and projects and announced a number of new measures in 2020 targeted at early-stage technology development, with a particular emphasis on boosting economic recovery and supporting businesses during the COVID-19 pandemic.

Canada provided approximately $683 million and $787 million in clean energy research and development funding in 2019-20 and 2020-21, respectively. Canada also continued working with 24 countries and the European Union through the global Mission Innovation initiative, to accelerate clean energy innovation. British Columbia's Innovative Clean Energy Fund and Sustainable Development Technology Canada continued to work together to support the development of pre-commercial clean energy projects and technologies. Alberta and Canada provided funding for clean technology development to reduce methane and short-lived climate pollutants from the oil and gas sector and Alberta announced $280 million in funding to support innovative projects for small, medium and large industries across all sectors in Alberta. Québec provided an additional $58.5 million over five years for research and innovation activities and funded an Industrial Research Chair at the Université de Sherbrooke, for the launch of the strategic Intelligent Energy Network. New Brunswick worked to develop a research cluster in the province to advance the development of small modular reactors.

Accelerating Commercialization and Growth

The demand for clean technologies in the global market is rapidly increasing and expected to continue to grow as countries, companies and individuals address the challenges of climate change and emissions reductions. There is an opportunity and an imperative for Canadian innovators to be globally competitive to get their technologies to market. Governments in Canada have made a number of investments in recent years to support businesses to attract and develop the talent and secure the capital needed to grow and to access international markets. Governments have also engaged in standards setting to ensure technologies developed in Canada will be able to access domestic and international markets.

In 2020, governments continued their support for a number of major initiatives. Canada continued to provide streamlined client services through the Clean Growth Hub and helped Canadian clean tech firms grow and access global climate finance opportunities through initiatives such as the International Business Development Strategy for Clean Technology and the Trade Commissioners Service. Québec's Innovation Project supported businesses to carry out and market their innovation projects. Manitoba provided funding for the Manitoba Environmental Industries Association to deliver a range of programs on job training, and training for sustainable technology implementation. Nova Scotia's Atlantic Immigration Pilot offered faster processing times for employers to bring skilled foreign workers and international graduates to fill identified labour gaps. The Standards Council of Canada advanced nine standardization proposals that will grow Canadian exports and create jobs, as well as five standardization proposals focused on intellectual property.

Ontario funds 17 Regional Innovation Centres which provide services and programming to help entrepreneurs and innovators commercialize their ideas, attract the talent, capital, and customers they need to succeed and grow their businesses in Canada and internationally. Ontario also works with other organizations to support innovation and job creation activities.

Alberta committed much of the TIER fund to support economic recovery projects and reduce emissions. Over three years, Alberta is spending up to $750 million from the TIER fund to support up to 8,700 jobs and inject $1.9 billion into the economy. Supported by TIER funding, Alberta's Industrial Energy Efficiency and Carbon Capture, Utilization and Storage Grant Program provides $100 million for projects like electricity co-generation, waste heat recovery, and low-carbon fuel feed systems.

Fostering Adoption

The adoption of clean technology can help Canadians realize cost savings and other benefits such as more reliable and climate-resilient infrastructure, while also reducing emissions. Strengthening demand for clean technology in Canada can also help Canadian companies develop domestic markets and build momentum for Canadian technology solutions. Governments have an important role to play, both in supporting individuals, businesses and communities to adopt clean technologies, and also as a first adopter for government operations. In 2020, governments across Canada continued to implement programs to green government operations and support consumers, industry, Indigenous Peoples and northern and remote communities.

The federal government, through Innovative Solutions Canada, supported Canadian businesses to develop and test innovative solutions to challenges identified by federal departments and updated its Greening Government Strategy, which encourages federal departments to adopt clean technology and undertake clean

technology demonstration. Programs and initiatives such as Canada's Northern REACHE Program, the Canada Infrastructure Bank Growth Plan, British Columbia's Community Energy Leadership Program, and Québec's Société du Plan Nord supported the adoption of clean technologies in Indigenous, northern and remote communities. British Columbia reduced GHG emissions from its buildings and fleet by increasing funding for the Carbon Neutral Capital Program to $50 million per year. Alberta announced up to $280 million in funding for three programs (the Shovel Ready Challenge, the Energy Savings for Business Program, and the Partnership Intake Program) to support approximately 5000 jobs and reduce an estimated 13 million tonnes of GHG emissions by 2030. Nova Scotia advanced work to convert fossil fuel heating systems at government facilities to new, efficient wood chip heating systems. Newfoundland and Labrador invested $14 million to continue to transition public buildings to clean electricity, through electrification retrofits, as well as energy efficiency improvements.

Strengthening Collaboration and Metrics For Success

Governments have long recognized the importance of working together on climate change efforts to make best use of available resources and maximize benefits. Addressing gaps in Canada's clean technology and innovation data has been identified as a central focus for coordinated action by jurisdictions, to identify and track metrics of success, and assess the impact of government initiatives. A number of actions continued or were launched in 2020, including the work of Canada's Clean Growth Hub, which signed an information-sharing Memorandum of Understanding (MOU) with Nova Scotia, in addition to existing MOUs with British Columbia and Alberta.

Nova Scotia, British Columbia, Ontario, Québec, Manitoba, and New Brunswick worked to harmonize efficiency standards for home appliances with federal regulations through the Regulatory Reconciliation and Cooperation Table. The Federal-Provincial-Territorial Working Group on Clean Growth continued discussions on data produced through the Clean Technology Data Strategy. The Canadian Centre for Energy Information, a collaborative effort involving federal, provincial and territorial governments and a wide range of energy stakeholders, launched its website to facilitate access to Canada's energy-related data and analysis. Canada launched the Small Modular Reactor (SMR) Action Plan, building on Canada's SMR Roadmap published in 2018. Following on the 2019 agreement of the Atlantic Provinces and the federal government to work together to develop a Clean Power Roadmap for Atlantic Canada, Canada released the *Clean Power Road Map Interim Report* in August 2020.

Canada launched the Small Modular Reactor (SMR) Action Plan, building on the momentum of Canada's SMR Roadmap, and laying out the next steps to develop and deploy SMRs in Canada. **New Brunswick**, **Alberta**, **Saskatchewan**, **Ontario**, **Yukon**, and **Prince Edward Island** and **Nunavut's** Qulliq Energy Corporation contributed to the Action Plan.

6.0 Reporting and Oversight

Measurement and Reporting on Emissions

Governments continued to deliver on PCF commitments to measure and report on GHG emissions in 2020. The Canadian Council of Ministers of the Environment completed its review of the methodologies used to estimate black carbon emissions. The results point to potential improvements that could be made in the reported National Pollutant Release Inventory (NPRI) emissions data and challenges with the availability of detailed fuel consumption statistics. The federal government is currently working to improve the NPRI emissions data and consultation is underway with the NPRI Stakeholder Committee on proposed changes to requirements for air pollutant reporting. Potential changes are anticipated for the 2022 reporting year.

Québec adopted *An Act mainly to ensure effective governance of the fight against climate change and to promote electrification* which gives the Minister of the Environment and the Fight against Climate change the responsibility to give directives to the departments and public bodies concerning the methods they must apply in order, in particular, to calculate the quantity of greenhouse gas emitted, reduced, prevented or limited. These directives will ensure coherence throughout governmental action.

Alberta continued its leadership in methane emissions measurement. New measurement and reporting requirements took effect to improve methane inventories from the upstream oil and gas sector. In fall 2020, Alberta also committed to invest over $30 million in programs to improve identification and quantification of methane emission sources from the sector. The $10 million Baseline and Reduction Opportunity Assessment Program supports small and medium-sized oil and gas operators to conduct detailed assessments of methane reduction opportunities and fugitive emissions. The $3 million Sundre Petroleum Operators Group Pilot Methane Emissions Management Program and the $17 million Alberta Methane Emissions Program support investigation and testing of alternative approaches to detection and quantification of fugitive and vented emissions.

External Analysis and Advice

Governments recognize the importance of incorporating external and expert analysis and advice into the development and execution of their climate change activities. Climate change science is an ever-evolving field, with new and updated scientific reports, climate projections, and emissions estimates released that inform government considerations. Engaging with external experts provides unique perspectives that governments can consider and incorporate into their activities.

Canada tabled the *Canadian Net-Zero Emissions Accountability Act* on November 9, 2020. The Act includes specific measures for third party review, the provision of independent advice, and the public release of reports and plans. For example, the Act establishes an advisory body which will provide the Minister of Environment and Climate Change with independent advice on achieving net-zero emissions by 2050. The advisory body will provide independent advice to the Minister through its annual reports, and the Minister must publicly respond to the advice in their annual reports. Moreover, the Commissioner of Environment and Sustainable Development must, at least once every five years, examine and report on the Government's implementation of climate change mitigation measures, including those undertaken to achieve each target.

Québec adopted *An Act mainly to ensure effective governance of the fight against climate change* and to promote electrification which, among other things, establishes an advisory committee on climate change, and provides advice to the government on guidance, programs, policies and strategies in the fight against climate change, while taking into account scientific and technological knowledge as well as scientific consensus on a given topic. The law came into force on November 1, 2020.

In Budget 2018, Canada announced funding to fulfill the PCF commitment to engage external experts to assess the effectiveness of its measures and identify best practices. In 2019, the Canadian Institute for Climate Choices (CICC) was selected to receive funding support through a competitive, open call for proposals process. The CICC formally launched in January 2020 and, in turn, released a number of reports and case studies throughout the year.[31] The Institute is a wholly independent organization and retains full control over its research, findings and policy recommendations.

31 https://climatechoices.ca/reports/

7.0 Federal Engagement With Indigenous Peoples

The Government of Canada has continued collaborative engagement with Indigenous Peoples through three distinctions-based, senior, bilateral tables, in accordance with joint commitments made by the Prime Minister and National Leaders of the Assembly of First Nations, Inuit Tapiriit Kanatami and the Métis National Council in 2016. These forums seek to ensure First Nations, Inuit and Métis are full and effective partners in advancing clean growth and addressing climate change through robust, ongoing and meaningful engagement based on recognition of rights, respect, cooperation and partnership, consistent with the *United Nations Declaration on the Rights of Indigenous Peoples*, including free, prior and informed consent.

Consistent with lessons learned at the senior bilateral tables over the past three years, the Government of Canada continues to explore avenues to strengthen support for Indigenous priorities in addressing the negative impacts of climate change. Since the adoption of the PCF, Canada has invested over $770 million to support Indigenous climate projects in areas of adaptation planning, clean energy, health, infrastructure, and climate monitoring, among others.

In December 2020, Canada released its strengthened climate plan, *A Healthy Environment and a Healthy Economy*, which recognizes the significant and disproportionate environmental, economic, and social impacts of climate change on Indigenous Peoples and their communities.[32] This plan was informed by the engagement undertaken with First Nations, Inuit and Métis Nation since the creation of the bilateral tables. *A Healthy Environment and a Healthy Economy* builds on the foundational principles of Indigenous climate leadership to support self-determination and seeks to implement the

32 https://www.canada.ca/content/dam/eccc/documents/pdf/climate-change/climate-plan/healthy_environment_healthy_economy_plan.pdf, p.67, 68.

principles of the *United Nations Declaration on the Rights of Indigenous Peoples* by committing to work with First Nations, Inuit and Métis Peoples to co-develop decision-making guidance that will ensure all of Canada's future climate actions help advance Indigenous climate self-determination.

Working with First Nations

In 2020, the First Nations—Canada Joint Committee on Climate Action (JCCA) identified five areas for collaboration in the area of climate, which will continue to guide joint work between the Government of Canada and the Assembly of First Nations in coming years. Priority areas include:

- Ensuring First Nations' full and effective participation in federal clean growth and climate change programs;
- Empowering First Nations' leadership in emerging opportunities for climate action;
- Enabling the meaningful participation of First Nations in the carbon pollution pricing system;
- Developing First Nations-specific indicators / criteria to report on the implementation of climate-related federal funding programs and outcomes for First Nations; and,
- Creating spaces for an intergenerational dialogue on climate change.

The JCCA met three times virtually in 2020 and held several workshops to advance this work, and released its 2020 Annual Report to the National Chief and the Prime Minister.[33]

Working With the Métis Nation

The Métis Nation—Canada Joint Table on Clean Growth and Climate Change has met five times since it was first established in 2017. The fifth Joint Table meeting was scheduled for March 2020 in Vancouver, but, due to COVID-19, the meeting was postponed until February 2021. Members of this Joint Table have begun to build relationships to identify Métis Nation-specific considerations for designing programs and delivering funding under the PCF and to share information toward the co-development of climate policy. Federal departments responsible for implementing the PCF are striving to adjust their programs and policies and to work with the Métis Nation on a distinctions basis. This includes work to shape community-based climate monitoring initiatives and to advance self-determined, Métis Nation climate-action priorities. Priority areas include:

- Capacity building;
- Collecting Métis Nation traditional knowledge;
- Conducting research and collecting data to guide Métis Nation-specific policy development and implementation;
- Education and training opportunities in climate change:
- Environmental stewardship and nature-based solutions;
- Emergency management and disaster-risk mitigation;
- Climate change and health; and,
- Renewable energy and energy-efficiency retrofits.

33 The JCCA released its 2020 Annual Report to the National Chief and the Prime Minister in August 2021.

Working With Inuit

The Inuit—Canada Joint Table on Clean Growth and Climate Change has held three official meetings. The Joint Table's November 2020 meeting focused on advancing Inuit-Crown priorities on climate change using the *National Inuit Climate Change Strategy* (NICCS) as a framework for joint action. To date, the Government of Canada has committed to provide $1 million to support the implementation of the NICCS. The Secretariat of the Joint Table is in the process of drafting a work plan to determine specific roles of federal departments in supporting the implementation of the NICCS moving forward. The federal government's support will continue to help advance Inuit-led activities and initiatives in the following areas:

- Advancing the use of Inuit capacity and knowledge in climate decision-making;
- Improving Inuit health and environmental health outcomes through integrated wellness, education and climate policies and initiatives;
- Reducing the climate vulnerability of Inuit and market food systems;
- Closing the infrastructure gap with climate-resilient new builds, retrofits to existing builds, and Inuit adaptation to changing natural infrastructure; and
- Supporting regional and community-driven energy solutions, leading to Inuit energy independence.

Annex

2.0 Carbon Pollution Pricing	
Canada	• In 2020, the federal output-based pricing system (OBPS) continued to apply in Ontario, New Brunswick, Prince Edward Island, Manitoba, Yukon, Nunavut, and partially in Saskatchewan. On September 20, 2020, the Minister of Environment and Climate Change informed Ontario and New Brunswick that their carbon pollution pricing systems for industrial facilities met the federal benchmark for the sources they cover. As a result, the Government of Canada also signaled in 2020 its intention to stand down the federal OBPS in both provinces as of a date determined in consultation with each of the two provincial governments. • Given the extraordinary circumstances during the COVID-19 pandemic, Environment and Climate Change Canada amended the OBPS Regulations to postpone the deadline for submitting the annual report and the verification report related to the 2019 compliance period from June 1, 2020 to October 1, 2020. Compensation deadlines for the 2019 compliance period were also postponed. The regular-rate compensation deadline was extended from December 15, 2020 to April 15, 2021. The increased-rate compensation deadline was extended from February 15, 2021 to June 15, 2021. • In August 2020, Canada published a List of Recognized Offset Programs and Protocols for the federal OBPS. The list identifies the provincial offset programs and protocols that can generate eligible credits to be remitted as recognized units for compensation under the federal OBPS.

2.0 Carbon Pollution Pricing	
Canada	• The federal government is currently developing the Federal GHG Offset System under the *Greenhouse Gas Pollution Pricing Act*, to encourage cost-effective domestic GHG emissions reductions and removals from activities not covered by carbon pollution pricing. In July 2020, Canada published a discussion paper entitled "Carbon Pollution Pricing: Considerations for Protocol Development in the Federal GHG Offset System" to seek additional input on design considerations for the Federal GHG Offset System, with a focus on protocol development. On March 6, 2021, Canada published proposed regulations in Canada Gazette Part I for establishing a Federal GHG Offset System. • The federal fuel charge was implemented in Alberta on January 1, 2020, and ceased to apply in New Brunswick on April 1, 2020. The federal fuel charge continued to apply in Ontario, Manitoba, Alberta, Saskatchewan, Yukon and Nunavut.
British Columbia	• In 2020, British Columbia's carbon price was $40 per tonne of CO_2e and has equivalency with the federal carbon pricing system. In response to COVID-19, British Columbia deferred the scheduled increase to the carbon tax to $45 per tonne to April 1, 2021. • In 2020, the province increased the personal climate action tax credits, tied to carbon tax revenues. In addition, as part of its COVID-19 Action Plan, British Columbia announced a one-time enhanced climate action tax credit payment for July 2020. • In June 2020, under the CleanBC Industrial Incentive program, part of the CleanBC Program for Industry – an example of maintaining industrial competitiveness and encouraging new green initiatives, the province released world-leading industry emissions benchmarks, encouraging cleaner industrial operations by reducing carbon tax costs for low emission facilities. • The CleanBC Industry Fund closed its second call for innovative projects to reduce emissions in June 2020. The 2020 CleanBC Industry Fund is investing approximately $33 million in carbon tax revenue in 22 emission-reduction projects, with industry and partners contributing an additional $51 million.
Alberta	• The Technology Innovation and Emissions Reduction (TIER) Regulation came into force on January 1, 2020. • TIER continues the province's leadership in industrial carbon, where Alberta was the first jurisdiction in North America to establish industrial carbon pricing and emissions trading in 2007. As of January 2020, Alberta's industrial carbon pricing system has resulted in 175 Mt of compliance action. • The TIER Regulation is Alberta's approach to managing GHG emissions from large industrial emitters in the province. It is an industrial carbon pricing and emissions trading system that automatically applies to any facility that has emitted 100,000 tonnes or more of carbon dioxide equivalent (CO_2e) GHG emissions in 2016, or any subsequent year.

2.0 Carbon Pollution Pricing	
Alberta	• A facility with fewer than 100,000 tonnes of CO2e GHG emissions per year may voluntarily apply to opt-in to the TIER system if it competes against a facility regulated under TIER, or has emissions greater than 10,000 tonnes of annual GHG emissions and is in an emissions-intensive, trade-exposed (EITE) sector. • Multiple small conventional oil and gas facilities with a common person responsible can also enter into TIER by voluntarily applying to be regulated as an aggregate facility. TIER provides regulated facilities with a number of compliance options, including: on-site emission reductions; use of emissions performance credits (produced and traded by facilities that exceed their emission reduction obligations); use of Alberta-based emissions offsets; and payment into a TIER fund ($30 per tonne of CO2e in 2020 rising to $40 in 2021). Under TIER, emissions performance credits and emissions offsets combined may not be used to satisfy more than 60 per cent of a facility's total compliance obligation for a single compliance year. • The federal fuel charge is applied in Alberta, beginning in 2020. • TIER extends the pricing of greenhouse gas reductions by enabling offsets to be used for compliance purposes. Approximately 5.5 Mt of emission reductions were registered in 2020 in 177 different projects using 17 different types of activities. • The TIER Fund is a compliance option for regulated industry. Alberta's government is investing the TIER Fund to reduce emissions, help communities adapt to the impacts of climate change, and create jobs. These programs support technology development and deployment for priority areas including carbon capture, utilization and storage, methane emission management, industrial energy efficiency, and clean energy development. Investments in innovative projects for small, medium and large industries across all sectors in Alberta are helping facilities lower emissions, create investment opportunities and while cutting costs.
Saskatchewan	• Saskatchewan has a provincial OBPS program that is mandatory for facilities emitting more than 25,000 tonnes of CO_2e per year and voluntary for facilities emitting more than 10,000 tonnes of CO_2e per year. • Payment into the Saskatchewan Technology Fund is one compliance option available to regulated emitters under the OBPS program. Effective January 1, 2020, the rate for payments into the Fund was increased to $30 per tonne CO_2e, an increase from $20 per tonne CO_2e for 2019 emissions. • In September 2020, Saskatchewan introduced amendments to increase the scope of application of the *Management and Reduction of Greenhouse Gases (Standards and Compliance) Regulation* for expanded coverage of the OPBS program. Following the amendment, aggregate facilities in the upstream oil and gas sector may voluntarily register under OBPS with no minimum stationary fuel combustion emissions requirements. The removal of the minimum threshold enables more Saskatchewan companies to seek provincial regulatory coverage, meaning more companies will be subject to emission reductions requirements. This amendment only applies to aggregate facilities in the upstream oil and gas sector. The previous threshold for voluntary registration of 10,000 tonnes CO_2e still applies to single facilities registered in the program from other sectors.

2.0 Carbon Pollution Pricing	
Manitoba	• The federal backstop carbon pollution pricing system applies in Manitoba with the following features: (a) for larger industrial facilities, the federal OBPS for EITE industries started applying in January 2019, covering facilities emitting 50,000 tonnes of CO_2e per year or more, with the ability for smaller EITE facilities that emit 10,000 tonnes of CO_2e per year or more to voluntarily opt-in to the system over time; (b) a regulatory charge applied to fossil fuels, as set out in the *Greenhouse Gas Pollution Pricing Act*, Part 1, started in April 2019.
Ontario	• Ontario has developed an Emissions Performance Standards (EPS) program to regulate GHG emissions from large emitters. Ontario's EPS is a regulatory approach that establishes GHG emissions performance standards that facilities are required to meet or use compliance units for GHG emissions in excess of the standard. The purpose of the EPS regulation is to reduce GHGs in the industrial sector and to provide flexibility for Ontario circumstances as an alternative to the federal OBPS portion of the federal *Greenhouse Gas Pollution Pricing Act* (GGPPA). • The EPS program applies to facilities that have emitted 50,000 tonnes or more of carbon dioxide equivalent per year, in any year starting from 2014 onward. Facilities that have emitted between 10,000 and 50,000 tonnes of CO_2e per year, in any year starting from 2014 onward, may choose to opt into the program. Ontario is regulating the same sectors that are covered by the federal OBPS to simplify reporting and compliance and to provide clarity for Ontario businesses. • The federal government confirmed in September 2020 that the EPS met the federal benchmark and indicated that the federal OBPS would cease in Ontario[34].
Québec	• The third compliance period for Québec's cap-and-trade (C&T) system ended December 31, 2020. Regulated emitters will have until November 1, 2021, to remit enough emission permits to Québec to cover their GHG emissions during the compliance period. • Following the implementation of pandemic health measures, Québec pushed back the submission date for companies' GHG emission declarations by two months. However, the implementation of the C&T system remained on track. To that end, Québec and California held the four joint auctions they had planned for 2020, bringing the total to 25 joint auctions since their markets were linked. During these sales, the price of emission units reached $23.86.

34 In March 2021, Canada informed Ontario of the decision to transition the federal OBPS to the provincial EPS program on January 1, 2022.

2.0 Carbon Pollution Pricing	
Québec	• In 2020, despite slowed activities due to the pandemic, Québec continued legal drafting of the offset credit protocol for carbon sequestration through afforestation and reforestation on private lands. The protocol is expected to be published in 2021. Québec also continued to develop its rules for the allocation of free emission units for the 2024–2030 period, which are expected to be made available to the public in 2021.
Nova Scotia	• The province held its first cap-and-trade (C&T) auctions in 2020. The June 2020 auction generated over $15 million and the December auction generated over $13 million. Nova Scotia's C&T program was launched in January 2019 and covers about 87 per cent of the province's GHG emissions. Nova Scotia is a Western Climate Initiative participating jurisdiction and uses the same online registry and auction systems as Québec and California; however, the province's C&T program is not linked to the Québec and California C&T system.
New Brunswick	• On April 1, 2020, New Brunswick's carbon tax commenced under the *Gasoline and Motive Fuel Tax Act*, replacing the federal fuel charge. The provincial carbon tax is set at $30 per tonne of CO_2e and applies to 22 separate fuels[35]. • Emissions from New Brunswick's large emitters are subject to carbon pricing under the federal Output-Based Pricing System (OBPS). In September 2020, the federal government confirmed that the provincial OBPS, met the federal benchmark and indicated that the federal OBPS would transition to the provincial system. The provincial OBPS will drive an incremental reduction in GHG intensity by 10 per cent by 2030 for New Brunswick's large emitters. As well, for electricity generation, the system will drive incremental reductions in GHG emissions while ensuring low and stable electricity rates[36].
Prince Edward Island	• Prince Edward Island administers a provincial carbon tax through the *Climate Leadership Act* and opted into the federal OBPS for large emitters. Marked gasoline and diesel for agriculture and fisheries sectors, light fuel oil for heating (i.e., furnace oil), and propane are exempt from the carbon tax. As of April 2020, the carbon price in Prince Edward Island was $30 per tonne. All revenue is returned to Islanders through rebates, tax or fee reductions, and programs. PEI submitted details regarding its approach to carbon pricing that Canada agreed meets the federal benchmark criteria for 2019 and 2020. A new approach is in development for consideration by Canada.

35 For a list of exemptions, please see the Gasoline and Motive Fuel Tax Act.

36 In April 2021, Canada informed New Brunswick of the decision to transition the federal OBPS to a provincial OBPS on January 1, 2021.

2.0 Carbon Pollution Pricing	
Newfoundland and Labrador	• Newfoundland and Labrador has implemented a hybrid carbon pricing system comprised of OBPS (performance) standards for large industrial facilities and large-scale electricity generation, and a carbon tax on transportation, building fuels, electricity generation, and other fuels combusted in the province[37]. Facilities that emit 25,000 tonnes of CO_2e per year are required to participate in the province's OBPS, and facilities that emit between 15,000 and 25,000 tonnes of CO_2e can opt-in voluntarily. The system covers both on-shore and off-shore facilities. Facilities operating under the threshold or who have not opted in are required to pay the carbon tax as per the Act and regulations. The system came into force on January 1, 2019, with the performance standards component established under the *Management of Greenhouse Gas Act* and associated regulations and the carbon tax component established under the *Revenue Administration Act* and associated regulations. In 2020, the province finalized operating infrastructure such as compliance report templates and developed a digital credit registry.
Yukon	• Yukon adopted the federal Pollution Pricing System, and as such implemented a carbon pollution price of $20 per tonne starting on July 1, 2019, and rising $10 per tonne annually on April 1 until 2022 when it reaches $50 per tonne (priced at $30 per tonne in 2020). Yukon also put in place a carbon rebate program which returns all revenue generated from the federal carbon levy to Yukoners broken down as follows: 51 per cent to businesses, 41 per cent to individuals, 3 per cent to municipalities, and 1 per cent to First Nations.
The Northwest Territories	• The Northwest Territories implemented carbon pricing through a carbon tax at the rate of $20 per tonne of GHG emissions on carbon-based fuels (except aviation fuel and wood), effective September 1, 2019. The authorizing legislation is the *Petroleum Products and Carbon Tax Act* and Petroleum Products and Carbon Tax Regulations. The first tax rate increased from $20 to $30 per tonne of GHG emissions on July 1, 2020.
Nunavut	• The federal government's backstop carbon pollution pricing system, with a regulatory charge on fuels of $20 per tonne and the federal OBPS came into effect in Nunavut on July 1, 2019. Since Nunavut is highly fossil fuel dependent and can be adversely affected by this carbon pricing, the GN has sought exemptions from the backstop's coverage. As part of the PCF commitment to address the unique circumstances of the territories, the federal government agreed to exempt intra-jurisdictional aviation fuel consumed within the territories and diesel fuel used for electricity generation within Nunavut. Nunavut concurrently launched a Nunavut Carbon Rebate program which temporarily limits the impacts of the carbon tax for Nunavummiut by covering half of the carbon tax amount on home heating oil, vehicle diesel, and other fuels. Programs for future carbon pollution pricing revenues are under development.

37 Some exemptions apply under the Revenue Administration Regulations.

3.0 Complementary Actions to Reduce Emissions

3.1 Electricity

Increasing Renewable and Non-Emitting Sources

- In December 2020, Canada, Alberta, Ontario, New Brunswick, Prince Edward Island, Saskatchewan, and Yukon, as well as Indigenous communities, municipalities, civil society groups, academic institutions and other stakeholders released Canada's Small Modular Reactor (SMR) Action Plan.
- Canada and Nova Scotia renewed their equivalency agreement regarding traditional coal-fired electricity, covering the period January 1, 2020 to December 31, 2024.
- Canada and Saskatchewan signed an equivalency agreement regarding GHG emissions from electricity producers from 2020-2024. Saskatchewan agreed to have at least 40 per cent of its electricity generation capacity be from non-emitting energy sources by 2030.
- As co-founder and co-chair of the Powering Past Coal Alliance (PPCA) in partnership with the United Kingdom, Canada continued to lead international efforts in advocating for the phase out of unabated coal power, ending the international financing of unabated coal power plants, and promoting a just transition internationally.
- Canada's $200 million Emerging Renewable Power Program continued to support renewable technologies not yet established commercially in Canada. Total supported electricity generation capacity by late 2020 from the program was 56 megawatts.
- Under the Investing in Canada Infrastructure Program (ICIP), Canada approved and announced 11 clean energy projects with a program contribution of over $58.3 million. Canada also announced a number of investments in clean energy through its Low Carbon Economy Fund.
- Canada announced a $20 million investment from the Strategic Innovation Fund in Terrestrial Energy to accelerate development of the company's Integral Molten Salt Reactor power plant.
- The Hydrogen Strategy for Canada was released in December 2020, following three years of collaboration with governments at all levels, Indigenous organizations and other stakeholders. The Strategy identifies the economic and environmental opportunities for clean production and use of hydrogen across all sectors of the Canadian economy, cementing hydrogen's role in Canada's net zero future, while positioning Canada to be a supplier of choice to the world for clean hydrogen and the technologies that use it.
- British Columbia released the Phase 2 Interim Report of the comprehensive review of BC Hydro.

3.0 Complementary Actions to Reduce Emissions

3.1 Electricity

Increasing Renewable and Non-Emitting Sources

- Alberta updated its TIER emissions offset system to recognize the emissions reductions of reducing electricity consumption or generating new energy from alternative and renewable sources.
- Alberta is a leading jurisdiction in reducing emissions from coal-fired electricity generation. Alberta's TIER Regulation, which came into effect in 2020, sets the same standards for all power generation. Combined with a highly competitive energy-only market, this has led to industry plans to end emission from coal fired generation by 2023.
- Alberta's competitive electricity market has seen more than $1 billion in announced new investments in wind and solar generation projects in the second half of 2020, representing more than 1,110 megawatts of new renewable generation capacity connected to Alberta's grid.
- Alberta, through Emissions Reduction Alberta, announced in June 2020 the Natural Gas Challenge, a $58.4 million funding commitment for 20 projects worth over $155 million to improve cost competitiveness, spur innovation, and reduce greenhouse gas emissions in Alberta's natural gas sector.
- In October 2020, Alberta introduced Bill 36 – the *Geothermal Resource Development Act* – establishing a legislative framework to encourage geothermal resource development in the province.
- Saskatchewan continued to operate a carbon capture and storage project on a traditional coal power plant at Boundary Dam and pursued approvals for the construction of an additional plant.
- Saskatchewan continues to work on a number of wind and solar projects. The 200 megawatt Golden South Wind Project broke ground in summer 2019 and is expected to be in service by spring 2021. Saskatchewan signed Power Purchase Agreements for two 10-megawatt solar power generation projects through the First Nations Power Authority in 2020 – the Awasis Project on Cowessess First Nation and Pesakastew Solar Project near Weyburn – which are expected to be in service in early 2022.
- Manitoba continued adding new renewable electricity capacity through the completion of the Keeyask generating station, expected to come online in early 2021, which will add 695 megawatts of renewable electricity capacity in the province by 2022. Manitoba also began the process of ceasing operation of the Selkirk natural gas-fired station, to be fully decommissioned in April 2021.

3.0 Complementary Actions to Reduce Emissions

3.1 Electricity

Increasing Renewable and Non-Emitting Sources

- In November 2020, Ontario launched a Low-Carbon Hydrogen Strategy discussion paper for public consultation. This will be Ontario's first ever hydrogen strategy which will reduce GHG emissions. Recent private sector investments to promote the use of hydrogen in Ontario include:
    1. A power-to-gas facility built by Enbridge Gas Inc. and Cummins Inc. in Markham (2.5 megawatt capacity with the option to expand to 5 megawatts) that converts low-carbon electricity from the provincial power grid to hydrogen, providing reliable services for the electricity grid. The hydrogen will be injected into the natural gas distribution system (an additional $5 million investment). This utility-scale facility is the first of its kind in North America; and
    2. Onsite hydrogen production through electrolysis and a fueling station for forklifts at Canadian Tire's Brampton and Caledon distribution warehouses
- Ontario put forth a proposal for Community Net Metering in October 2020, which, if approved, would allow for limited demonstration of community net metering to support innovative community-based energy projects, such as net-zero community developments, and inform future net metering policy.
- In its 2030 PGE, Québec committed to develop a strategy on green hydrogen and bioenergies.
- Québec's 2030 Energy Policy continued seeking increased renewable energy production by 25 per cent through various means, including conversion projects for off grids networks, continuing support for mini power plant projects and wind farms, and upgrading existing hydroelectric power plants. Québec also intends to make solar energy a source of business opportunities for the province.
- Québec announced plans to increase its Renewable Natural Gas requirement to 10 per cent by 2030. In line with this, Québec deployed a Program to support the production of Renewable Natural Gas and its injection or its connection to the natural gas distribution system.
- Nova Scotia held its first cap-and-trade auction in June 2020, which generated over $15 million.
- Nova Scotia amended its renewable energy standard 2020 target of 40 per cent, due to various delays, ensuring that over 2020-2022, 40 per cent of electricity consumed in Nova Scotia will be from renewable sources.

3.0 Complementary Actions to Reduce Emissions

3.1 Electricity

Increasing Renewable and Non-Emitting Sources

- Nova Scotia worked in partnership with Canada, including the Clean Growth Hub, to advance opportunities for renewable energy generated from sources such as wind, tidal, and solar, as well as for the enabling of transmission and storage infrastructure to ensure growth in renewable electricity beyond current technical limits. Nova Scotia continued to administer its Clean Energy Revolution Pilot.
- Nova Scotia, along with the Atlantic Canada Opportunities Agency, Heritage Gas Limited, and Liberty Utilities, funded a project to evaluate the full hydrogen value chain and found that hydrogen can play a key role in Atlantic Canada's future energy mix.
- New Brunswick exceeded its 2020 Renewable Electricity Portfolio Standard ahead of schedule.
- Prince Edward Island's planned 2020 wind farm had faced several setbacks, due to COVID-19 and permitting issues. Meteorological tower testing finished and the project is moving to perform environmental assessments, while other potential locations for the project are being identified.
- Newfoundland and Labrador continued development of the Muskrat Falls hydroelectric project, and continued to support biogas and net metering programs in 2020 that provide utility customers with further renewable energy options.
- Newfoundland and Labrador also worked on developing a renewable energy plan in 2020.
- Newfoundland and Labrador worked with partners to complete two studies on the feasibility of powering future offshore oil and gas operations with clean electricity from the shores, and powering existing and future offshore operations with offshore wind energy. Further details available here. These studies received support from Canada.
- Yukon continued to implement its Micro-Generation Policy and Biomass Energy Strategy, and began installing biomass-heating systems in government buildings as part of a broader energy retrofit initiative, a project which is ongoing. Yukon also continued to enable renewable energy projects in diesel communities under its Independent Power Production policy.

3.0 Complementary Actions to Reduce Emissions

3.1 Electricity

Increasing Renewable and Non-Emitting Sources	• Northwest Territories continued to implement its 2030 Energy Strategy, and work also continued to advance the Taltson Hydroelectricity project. Northwest Territories also initiated studies to review the territory's Net Metering Policy and power system stability in off-grid diesel communities. • Nunavut's Net-Metering Program, through Qulliq Energy Corporation, continued to encourage hamlet and residential customers to install their own renewable energy system and offer energy credits for communities and individuals for feeding energy back into the energy grid. Qulliq Energy Corporation also received funding support from the Low Carbon Economy Leadership Fund to advance the exploration of geothermal resource potential in Resolute Bay, Cambridge Bay, and Baker Lake. • Under the Northern Energy Consortium, Qulliq Energy Corporation and Yukon University have partnered to develop an approach to analyze renewable energy penetration possibilities within existing power plants in Nunavut. Modeling data will be used by the Qulliq Energy Corporation to develop future renewable energy projects, as was completed in 2020 for the Arviat Clean Energy Project.
Connecting Clean Power With Places That Need It	• British Columbia and Canada continued to work together under the Memorandum of Understanding (MOU) on the Electrification of the Natural Gas and Liquefied Natural Gas sector to identify funding to support industrial electrification projects and transmission. British Columbia also expanded the clean electric grid for the natural gas industry via the Dawson Creek transmission line. • In February 2020, the Canada Infrastructure Bank announced a Memorandum of Understanding with the Kivalliq Inuit Association for the proposed Kivalliq Hydro-Fibre Link to Nunavut from Manitoba. The proposed project would provide renewable, sustainable, and reliable hydroelectricity and broadband connectivity to communities and industry for the first time. • In March 2020, Manitoba and Saskatchewan finalized a contract for an additional 215 megawatts of baseload renewable energy to begin flowing between the provinces in 2022, and also continued to collectively explore opportunities for further systems efficiency improvements. • New Brunswick and Québec signed three agreements to facilitate the transmission of energy, including clean energy, between the two provinces. • To guide investment in Atlantic Canada's electricity infrastructure, the Atlantic Growth Strategy Leadership Committee initiated an electrification impact and resource options study and a transmission study.

3.0 Complementary Actions to Reduce Emissions

3.1 Electricity

Connecting Clean Power With Places That Need It	• The Canada Infrastructure Bank announced $2.5 billion in funding over three years starting in 2020-21 until March 2023 via the recently announced Growth Plan and $4 billion over three to five years for clean power projects such as inter-provincial and regional interties, renewables, district energy systems, and energy storage. • The Manitoba-Minnesota Transmission line was energized in June 2020, aiming to export renewable electricity to neighbouring jurisdictions. • Québec deployed a financial assistance program for construction of liquefied natural gas and regasification storage infrastructures for the benefit of industrial establishments in Côte-Nord and Nord-du-Québec for conversion and use of cleaner type of energy. Québec also announced the granting of $24 million for the establishment of a first liquefied natural gas service on the Côte-Nord region and for the conversion of the Aluminum Smelter to natural gas. • Québec announced support for the extension of the Blue Route, which seeks to create a compressed or liquefied natural gas supply network. • Prince Edward Island's Transmission Line to Western Prince Edward Island was approved in 2020, and will enable additional renewable energy capacity for use. • Newfoundland and Labrador, as part of the Muskrat Falls Project, constructed additional transmission infrastructure that will facilitate the flow of electricity throughout Newfoundland and Labrador and to Nova Scotia. • Newfoundland and Labrador worked with partners to construct additional electricity transmission lines to facilitate increased reliance on hydroelectricity and reduce diesel consumption at a large industrial facility. The project should be completed in 2021. • Northwest Territories applied for federal funding for the Fort Providence Transmission Project, initiated formal consultation and engagement activities, initiated environmental and regulatory work, and undertook high-level engineering work. Once completed, the project would bring surplus power to Fort Providence and Kakisa and would reduce diesel fuel consumption for power generation by about one million liters annually.
Modernizing Electricity Systems	• The Atlantic Provinces continued work on projects funded under Smart Grid Atlantic, a four-year $130 million federally funded research, deployment and demonstration program

3.0 Complementary Actions to Reduce Emissions

3.1 Electricity

Modernizing Electricity Systems

- Canada continued providing $100 million under the Green Infrastructure Smart Grids program to promote the modernization of grid infrastructure by funding the demonstration of promising, near-commercial smart grid technologies and the deployment of smart grid integrated systems across the country.
- Canada announced an additional investment of $964 million over four years to advance smart renewable energy and grid modernization projects to enable the clean grid of the future.
- Canada's Smart Grid Symposium gathered electric utility companies, provincial and territorial partners, and smart grid stakeholders to discuss what energy transformation in Canada means for our electricity grids and electricity customer.
- Saskatchewan continued to deploy software to remotely control and manage intelligent devices in the energy distribution network in 2020.
- Ontario continued development of competitive mechanisms to secure the province's future capacity needs through its Market Renewal Program. Ontario's Independent Electricity System Operator held its first capacity auction in December 2020 for the Summer 2021 commitment period (from May 1 to October 31, 2021). A total of 72.5 megawatts of renewable power came online in 2020 including hydro, solar and wind which were procured via previous mechanisms. Ontario's Grid Innovation Fund (formerly the Conservation Fund) continued to advance innovative opportunities to achieve bill savings for electricity customers.
- Ontario, with support from Canada, is undertaking a demonstration in York Region to explore market-based approaches to secure energy and capacity services from distributed energy resources (DERs) for local needs, while coordinating across the electricity system.
- Québec's first electric microgrid was commissioned in December 2020, and the project should be completed towards the end of 2021.
- Prince Edward Island reviewed the *Electric Power Act* and the *Renewable Energy Act* in 2020 to maximize the benefits from renewable sources of electricity and the future electrification of the transportation system, while providing fair and cost-effective rates for Islanders. In 2020, the Electricity Efficiency and Conservation Advisory Committee made recommendations on Demand Response Initiatives for the next Demand Side Management plan.

3.0 Complementary Actions to Reduce Emissions

3.1 Electricity

Modernizing Electricity Systems	• The Newfoundland and Labrador Board of Commissioners of Public Utilities provided a report to the Government of Newfoundland and Labrador that included province-specific expert evidence and analysis to support smart grid policy development in the province. • Newfoundland and Labrador and its crown utility, Newfoundland and Labrador Hydro, supported the Nunatsiavut Government's pursuit of its Nain Remote Micro Grid Project in 2020.
Reducing Reliance On Diesel and Working With Indigenous Peoples and Northern and Remote Communities	• Canada announced in December 2020 that it would invest an additional $300 million over five years to advance the federal government's commitment to ensure that remote and Indigenous communities that currently rely on diesel have the opportunity to be powered by clean, reliable energy by 2030. Canada also continued working with communities across the country that are reliant on diesel for electricity and heat to transition to renewable energy. • Canada, via its Investing in Canada Infrastructure Program – Green Infrastructure Stream – approved two projects in July 2020 that will reduce the reliance on diesel in Indigenous and remote communities in British Columbia. Canada, via Impact Canada's Indigenous Off-Diesel Initiative, selected fourteen Energy Champions (finalists) from across the country, and these Champions are carrying out community energy planning and engagement additional training, and development of a clean energy project. • Canada continued implementing the $53.5 million Northern Responsible Energy Approach for the Community Heat and Electricity Program, with 32 clean energy projects approved in 2020. • Canada continued administering the $218 million Clean Energy for Rural and Remote Communities Program in 2020, announcing ten projects in Canada's north and eight projects in Ontario. • British Columbia, as part of the CleanBC Remote Community Energy Strategy, awarded $13.8 million through the Renewable Energy for Remote Communities program to support the construction of four renewable electricity generation projects. British Columbia's CleanBC Indigenous Heat Pump Incentive provided rebates for fuel-switching heat pump installation projects in residential and community buildings. • Alberta worked with ATCO Electric to develop options to enable the reduction of diesel in remote and northern, predominantly Indigenous communities by implementing cleaner sources of electricity, such as the Three Nations Energy LP solar project in Fort Chipewyan. • Alberta's Indigenous Opportunities Corporation launched in 2020, with an ability to provide up to $1 billion in loan guarantees to help Indigenous communities access capital and technical support for natural resource projects and infrastructure. The corporation's first loan guarantee was to a consortium of six First Nations, supporting their investment in the Cascade Power Project, a 900 MW plant near Edson, Alberta.

3.0 Complementary Actions to Reduce Emissions

3.1 Electricity

Reducing Reliance On Diesel and Working With Indigenous Peoples and Northern and Remote Communities

- Ontario and Canada continued to collaborate on the Wataynikaneyap Power project, a partnership of 24 First Nations, Fortis and Algonquin Power, that is constructing over 1800 km of transmission lines in northwestern Ontario to connect 16 remote First Nations Communities. Pikangikum First Nation was the first community in the project to be successfully connected to the provincial power grid in December 2018, and construction of the rest of the project began in February 2020, with the expectation to connect the remaining 15 communities by the end of 2023.
- Ontario continued to engage with on-reserve First Nation communities to relaunch electricity conservation programs postponed due to COVID-19 and to help inform the design of new conservation programs planned for launch in Fall 2021.
- In Ontario, Enbridge Gas continued to administer the Ontario-based Indigenous Home Winterproofing pilot program in communities served by natural gas. In 2021, the company will assess opportunities to expand the pilot to other First Nation communities.
- Québec announced the Three-Phase Grid Extension Program to help rural and under-served farm and agri-food businesses reduce emissions, and continued building clean energy projects in off-grid communities.
- Newfoundland and Labrador engaged in a variety of initiatives to reduce diesel use, improve energy security, and reduce the energy costs associated with these systems in 2020, in conjunction with Newfoundland and Labrador Hydro.
- Yukon continued to support the development of renewable energy projects in communities through a number of initiatives, supporting energy efficiency programming, capacity development, and renewable energy generation.
- Northwest Territories continued work on projects aimed at reducing GHG emissions for electricity generation in remote diesel communities, such as replacing diesel-electric plants and installing LNG facilities.
- Nunavut's Quilliq Energy Corporation, as part of replacing eight power plants and upgrading eight generators, completed required project analysis and planning. Canada's Arctic Energy Fund and Clean Energy for Rural and Remote Communities funding will also incorporate renewable energy technology for the new power plant in Kugluktuk, of which construction began in 2020.
- Nunavut's Qulliq Energy Corporation began preparing to purchase electricity from commercial/institutional customers with completed renewable energy installations to reduce reliance on diesel.

3.0 Complementary Actions to Reduce Emissions

3.2 Built Environment

Making New Buildings More Energy Efficient

- Under the Canadian Free Trade Agreement, Canada and provinces and territories, signed a Reconciliation Agreement on Construction Codes. This agreement has provinces commit to the adoption of Construction Codes effective within 24 months of the next (2020) National Codes, and within 18 months of subsequent codes (2025 and after).
- Canada launched the code development process to publish a more stringent model energy code for new houses and buildings. Publication of the National Building Code 2020 and National Energy Code for Buildings 2020 is planned for December 2021. Canada continued investing $48.3 million under the Green Infrastructure Energy Efficient Buildings Research, Development and Demonstration program to fund projects that will accelerate the development and adoption of net-zero-energy-ready building codes and technologies. In addition, the Local Energy Efficiency Partnerships (LEEP) initiative held 22 LEEP workshops and forums involving close to 900 home building industry leaders.
- Canada announced in December 2020 that it will conduct Canada's first-ever national infrastructure assessment, starting in 2021, to help identify needs and priorities in the built environment, and undertake long-term planning towards a net-zero emissions future.
- British Columbia committed to increasing energy performance requirements in the British Columbia Building Code through 2032 as follows: 20 per cent more energy efficient by 2022; 40 per cent by 2027; and 80 per cent by 2032. 2022 code development continued to progress in 2020.
- British Columbia's CleanBC Building Innovation Fund had a second intake of the fund in 2020, totalling $8 million for projects and programs that foster adoption of low-carbon building solutions. The Better Homes New Construction program launched in December 2020 and provides incentives for new construction projects that choose electric heating.
- Québec's Construction Code for large buildings was updated in 2020. The entry into force of the requirements will follow the 18-month transitional period, which will end in December 2021. The government also announced a $453 million investment for energy efficiency and energy transition for existing buildings.
- Nova Scotia offered a top-up to the rebate of up to $9,000 from Efficiency Nova Scotia for homes that meets certain efficiency standards.

3.0 Complementary Actions to Reduce Emissions

3.2 Built Environment

Making New Buildings More Energy Efficient	• Nova Scotia provided an additional $2,000 top up to the third tier of the Advanced New Home Construction program at Efficiency Nova Scotia to get new builders to build more efficient homes, which includes 75 per cent better than code, Net-Zero Ready, and Net-Zero or Passive House Certification. • New Brunswick's New Home Energy Savings Program registered 220 new builds and completed 275 new homes awarded $1.25 million in incentives. • Prince Edward Island's New Home Construction program continued to incentivize homeowners to build to ENERGY STAR® or R-2000 standards. By late 2020, 77 clients received grants for completing homes. • Newfoundland and Labrador's Build Better Buildings Policy incentivizes new buildings to achieve Leadership in Energy and Environmental Design Silver status. By late 2020, 68 buildings have registered under the Leadership in Energy and Environmental Design system in the province. • Yukon had most new homes now being built to a standard that is 50 per cent more energy-efficient than required by the National Building Code. As of April 2020 an additional incentive was added for homes that are 60 per cent more energy efficient than required by the National Building Code.
Retrofitting Existing Buildings	• In 2020, federal, provincial, and territorial governments worked together to develop increasingly stringent energy efficiency requirements, with the goal of provinces and territories adopting a "net-zero energy ready" model building code by 2030. Proposed changes have undergone public consultation and final publication is expected in 2021. • In 2020, Canada published a Model National Framework for energy benchmarking, labelling and disclosure for commercial and institutional buildings to provide best practices and guidelines to jurisdictions and other organizations. • In 2020, under its Investing in Canada Infrastructure Program, Canada approved nine projects – with building energy efficiency indicators – that received program contributions of more than $36.5 million. • Canada continued its expansion of the ENERGY STAR® Portfolio Manager benchmarking tool to include additional features. As of March 2020, 277 commercial and institutional buildings were ENERGY STAR® certified. • In November 2020, Canada proposed providing $2.6 billion over seven years, beginning in 2020-21, to help homeowners make energy efficiency improvements to their homes.

3.2 Built Environment

Retrofitting Existing Buildings

- In December 2020, Canada's Climate Action Incentive Fund was allocated up to $218 million, from 2019-20 carbon pollution pricing fuel charge proceeds collected in Saskatchewan, Manitoba, Ontario, and New Brunswick. Over 700 proposals ranging from solar energy generation, building retrofits, industrial equipment upgrades, and lighting upgrades under the Small and Medium-sized Enterprises Project stream were approved-in-principle.
- In December 2020, Canada announced that it will invest $1.5 billion over three years for Green and Inclusive Community Buildings through retrofits, repairs, upgrades and new builds, with 10 per cent of this funding to be allocated to projects serving First Nations, Inuit, and Métis Nation communities.
- British Columbia committed to the development of new standards for building upgrades by 2024 and requiring that realtors provide energy performance information on listed homes to foster awareness and drive adoption of energy efficiency measures. Also, British Columbia launched its CleanBC Better Homes Low-Interest Financing Program to help switching from a fossil fuel heating system to an electric heat pump.
- Alberta completed several projects funded by the $54 million grant to the Municipal Climate Change Action Centre to deliver multi-year funding for Community Energy Efficiency and Renewable Energy Programming.
- Alberta's Municipal Climate Change Action Centre was granted additional funding to administer a program that enables clean energy improvements through property-tied financing.
- Ontario continued to offer energy conservation programs to help consumers retrofit their homes and businesses to manage their energy usage and costs. Similarly, the Ministry of Energy, Northern Development and Mines posted energy use and GHG information for public sector organizations and large private sector building owners programs on the province's public Data Catalogue website.
- In May 2020, Québec presented a series of temporary exceptional improvements to most of its programs to support home and businesses retrofit. As of December 31, 2020, the Chauffez vert program allowed the installation of more than 55,000 heat pumps and Rénoclimat had nearly 27,000 post-renovation evaluations requests.

3.0 Complementary Actions to Reduce Emissions

3.2 Built Environment

Retrofitting Existing Buildings

- Nova Scotia's On-site Energy Managers Program continued to support qualified energy managers in municipalities, universities, schools, and hospitals to increase cost-effective energy efficiency investments by facilitating the identification and implementation of projects. The On-site Energy Managers Program has supported several organizations to prepare applications to the Green Stream of the Investing in Canada Infrastructure Program.
- Partnerships between Nova Scotia and Canada continued to enhance existing provincial energy efficiency programs for homes and businesses with the objective of reducing energy use and saving energy costs. This program will select 450 buildings to be piloted from 2019-2022. The program started intake in April 2020 and already registered 140 buildings.
- Nova Scotia developed a pilot program for energy benchmarking, labelling and disclosure for commercial and institutional buildings in the province. The pilot is very successful with 322 buildings enrolled to date.
- Nova Scotia partnered with the Canada Green Building Council to complete a skills gap analysis to better understand what gaps exist currently for net-zero energy ready construction.
- New Brunswick's Total Home Energy Savings program offered incentives to New Brunswick homeowners to improve energy efficiency, and 3,000 customers finished upgrades and received an average incentive of $1,300 per home. Also, the province's Low Income Energy Savings program worked directly with approximately 350 homeowners to install insulation and air sealing measures at no cost to the homeowners.
- Prince Edward Island, with the help of Canada's Low Carbon Economy Leadership Fund, recently embarked on a fuel-switching initiative, replacing light fuel oil heating systems with biomass heating systems.
- Newfoundland and Labrador, with support from Canada's Low Carbon Economy Leadership Fund, continued implementing the Home Energy Savings Program in 2020 to assist low-income electrically-heated households in making energy efficiency upgrades to their home. For instance, the Heat Pump Rebate Program, delivered only in 2019-20, got 848 approved applications which will translate in savings for the average homeowner.
- Newfoundland and Labrador, through Canada's Low Carbon Economy Fund, invested approximately $1 million in residential upgrades to reduce fuel oil consumption, and approximately $4.6 million to retrofit public buildings.

3.0 Complementary Actions to Reduce Emissions

3.2 Built Environment

Retrofitting Existing Buildings	• Yukon was successful in 2020 at obtaining $31 million in federal funding to expand Yukon's existing retrofit programs to target homeowners, businesses, municipalities, First Nation governments, and local industries. As of December 2020, 44 commercial and institutional projects were completed and another 58 are in development. • In 2020, Northwest Territories continued to administer two components of the Greenhouse Grant Program. In 2020, the program supported three projects. For example, the Yellowknife Education District No. 1 (YK1) school board was awarded $1.05 million under the GHG Grant Program to proceed with the installation of wood pellet boilers in two school facilities. Both installations are expected achieve an annual reduction of up to 578 tonnes of GHG emissions and up to $97,000 in operating costs. • The South Baffin Energy Management Project in Nunavut received $140,000 through the Low Carbon Economy Leadership Fund and $419,000 from Nunavut by March 2020. Over the lifetime of this energy efficiency project, Nunavut will see a cumulative reduction of about 38,900 tonnes of GHG emissions by 2030.
Improving Energy Efficiency For Appliances and Equipment	• Canada updated six ENERGY STAR® product specifications in 2020, including for windows, doors and skylights, and heat and energy recovery ventilators. • Saskatchewan partnered with approximately 180 independently owned natural gas appliance dealers and contractors to promote the benefits of high-efficiency gas equipment. • Saskatchewan introduced the Residential Equipment Replacement Rebate in November 2020, which offers rebates for furnaces, boilers, heat recovery ventilators, and up to $1000 for high efficiency water heaters. • In July 2020, Ontario updated its energy efficiency regulation to harmonize efficiency requirements for nine fuel-burning products with federal requirements, and to increase efficiency requirements for residential windows. • In November 2020, Ontario posted for public review a proposal for the next amendment to the efficiency regulation on its environmental and regulatory registries • New Brunswick's Total Home Energy Savings Program continued incentivizing a list of eligible heating systems.

3.0 Complementary Actions to Reduce Emissions	
3.2 Built Environment	
Improving Energy Efficiency For Appliances and Equipment	• Prince Edward Island expanded its suite of programs through a partnership with Canada's Low Carbon Economy Fund. Programs impacting the non-residential sector, such as the Community Energy Solutions program, were launched in 2020.
Supporting Building Codes and Energy Efficient Housing In Indigenous Communities	• British Columbia introduced an Indigenous Community Energy Coach program to facilitate access by Indigenous communities to the Better Homes and Better Buildings program offerings. • In Ontario, electricity conservation programs for on-reserve First Nation communities continued to be offered throughout 2020. Following an engagement with First Nation communities on program designs in fall 2020, new electricity conservation programs will be launched in fall 2021 to meet the changing needs of the communities. • Nova Scotia and Canada continued administering $14 million in investments to the Mi'kmaw Home Energy Efficiency Project which will see all band-owned homes on reserves qualify for upgrades like new insulation, heat pumps, and draft-proofing. • In New Brunswick, outreach and direct install product presentations were offered at various First Nation communities in 2020. This initiative trained and mentored Indigenous members as energy advisors.

3.0 Complementary Actions to Reduce Emissions

3.3 Transportation

Setting Standards and Improving Efficiency

- Canada provided funding to the Canadian Standards Association to research, develop, adapt and update codes and standards for electric and alternative fuel vehicles and infrastructure. Also, further analysis on the economic impacts of implementing *Operation of the Heavy-duty Vehicle and Engine Greenhouse Gas Emission Regulations (Trailer Standards)* was conducted.
- Canada's Green Freight Assessment Program assessed the energy use of more than 6,000 medium and heavy-duty trucks for lower carbon options, and supported over 3,700 retrofits.
- Through its Strengthened Climate Plan, Canada announced plans to reduce emissions in heavy duty vehicles, rail, marine and aviation, including the continuation of the current 100 per cent tax write off for commercial light-duty, medium- and heavy-duty ZEVs. Canada also announced the implementation of amendments to the *Off-Road Compression-Ignition (Mobile and Stationary)* and *Large Spark-Ignition Engine Emission Regulations* for new equipment such as forklifts and stationary diesel generators. These regulations establish new emission standards to reduce harmful air pollutants from new stationary diesel engines and large spark-ignition engines, combining them with the previous mobile diesel emission standard into one consistent regulatory framework.
- Canada continued work on the development of a minimum efficiency standard for replacement tires for passenger vehicles. Activities included a cost-benefit analysis and the development of a technical specification – the first step toward finalizing a standard, in collaboration with industry.
- Canada is currently conducting a midterm evaluation of the *Passenger Automobile and Light Truck Greenhouse Gas Emission Regulations* to establish the appropriateness of standards for vehicles model years 2022-2025, and estimate the impacts of the new less stringent standards published by the U.S. Environmental Protection Agency (EPA) in April 2020. Public consultation sessions were held through the summer of 2020 and a decision on Canada's midterm evaluation is expected in early 2021.
- Canada committed to align its emission standards with the most stringent standards at the U.S. federal or state level for the post-2025 time period in the *A Healthy Environment and A Health Economy* climate plan.
- Canada continues to collaborate with the Railway Association of Canada on the Rail Pathway Initiative to reduce locomotive emissions. The Landscape Document, which creates an inventory of activities contributing to emissions reductions, was completed in September, and discussions on next steps began in December 2020.

3.0 Complementary Actions to Reduce Emissions

3.3 Transportation

Setting Standards and Improving Efficiency

- Canada published the enabling regulations for the CO_2 Standard for airplanes as well as the for the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) in Canada Gazette Part II and published the 2018 Annual Report under Canada's Action Plan to Reduce GHG Emissions from Aviation.
- British Columbia introduced a regulatory framework for zero-emission vehicles, effective July 2020, that will require automakers to meet annual compliance targets for new light-duty vehicle sales, and prescribes technical requirements to ensure targets are met. New light-duty vehicle sales targets are 10 per cent by 2025; 30 per cent by 2030; and 100 per cent by 2040. In collaboration with the British Columbia Trucking Association, the Heavy-Duty Vehicle Efficiency Program completed its first year, exceeded training goals and providing over $1 million for equipment.
- British Columbia increased funding for its GoElectric Specialty-Use Vehicle Incentive in Budget 2020, which allow eligible medium- and heavy-duty transport trucks, delivery vans, electric cargo bicycles, passenger buses, and low-speed utility trucks. As part of the COVID-19 economic recovery plan, StrongerBC, the province committed an additional $31 million in the program, along with $30 million in a Commercial Vehicle Innovation Challenge.
- Alberta Transportation continued to allow the use of increased axle weights with New Generation Wide Base Single Tires as part of a pilot project, which commenced in 2016. The results of the pilot project show about 10 per cent improvement in fuel efficiency when compared with trucks with dual-tire configurations.
- Saskatchewan continues to develop a freight strategy with efforts focused on gathering information on trade impediments and gaps in the transportation system, and in 2020, the province also allowed the use of wide-spread tandem axles on commercial vehicles.
- Manitoba's Efficient Trucking Program received 66 applications and approved 61 applications in 2020. A total of 837 trucks (423) and trailers (414) have received fuel-saving/emission reduction retrofits. The retrofits have been supported with $2.1 million in rebate funds to the trucking sector, with 50 per cent funding support from the Low Carbon Economy Leadership Fund and 50 per cent funding support from the Province of Manitoba.

3.0 Complementary Actions to Reduce Emissions

3.3 Transportation

Setting Standards and Improving Efficiency	• Ontario's enhanced emissions testing program focuses on the biggest polluters on the road, such as commercial trucks and buses. Ontario worked to integrate vehicle emissions testing program for heavy diesel commercial motor vehicles with the annual safety Motor Vehicle Inspection Station program. Ontario is targeting a July 1, 2023 implementation date to integrate the emission requirements into the annual safety inspection for heavy diesel vehicles and align the inspection to annual plate renewals. • Québec extended their Marine, Air and Rail Efficiency Assistance Program to December 31, 2020 and Eco-trucking program to March 31, 2021. • In 2020, the Prince Edward Island Active Transportation Fund supported 22 different projects that helped build new walking and bike paths, widen paved shoulders, and better connect existing walking and cycling trails. • Yukon replaced older governmental heavy duty vehicles and incorporating fuel efficiency into purchase decisions to reduce GHG emissions and fuel costs. • The Northwest Territories continued to advance airport infrastructure and equipment improvements that will reduce energy consumption and GHG emissions.
Putting More Zero-Emission Vehicles On the Road	• The Canada Infrastructure Bank's $10 billion Growth Plan announcement in October 2020 included $1.5 billion to accelerate the adoption of zero-emission buses and associated charging infrastructure. In addition, the federal government committed to provide a $287 million top-up to the existing Incentives for Zero Emission Vehicle program, which provided $5,000 for the purchase of battery-electric, hydrogen fuel cell, and longer range plug-in hybrid vehicles, and a $2,500 incentive for the purchase of shorter range plug-in hybrid electric vehicles. • Canada committed an additional $150 million over 4 years to continue to support the build-out of new chargers and refuelling stations for zero emission vehicles, bringing the total investment to more than $460 million since 2016. As of December 2020, these investments, delivered through various electric vehicle and alternative fuel infrastructure programming, including the Zero Emission Vehicle Infrastructure Program and the Elective Vehicle and Alternative Fuel Infrastructure Deployment Initiative, have supported the build out of 1,107 electric vehicle fast chargers, of which 440 were installed, and 5,532 new level-2 chargers were also under construction. Additionally, there are 8 natural gas stations installed with 13 more under construction, and 4 hydrogen stations installed with 11 more under construction.

3.0 Complementary Actions to Reduce Emissions

3.3 Transportation

Putting More Zero-Emission Vehicles On the Road

- Canada continued to invest $182.5 million through the Electric Vehicle and Alternative Fuel Infrastructure Initiative to deploy infrastructure for electric vehicle charging and alternative fuel (e.g., natural gas and hydrogen) refuelling stations, as well as to support technology demonstration projects and enabling codes and standards.
- British Columbia's Enhanced CleanBC Go Electric Vehicle Rebate Program continued through 2020 offering up to $3,000 in rebate on selected light-duty vehicles models and support the purchase of passenger and commercial zero-emission vehicles, charging infrastructure, hydrogen fuelling infrastructure, public education and outreach, fleet support, and workforce training.
- British Columbia passed the *Zero-Emission Vehicle Regulation* in July 2020, bringing into force requirements on automakers to meet zero-emission vehicles sales targets starting in 2020, reaching 10 per cent of light-duty vehicle sales by 2025, 30 per cent by 2030, and 100 per cent by 2040. The province launched a new Public Charger Program, which includes increased rebates for Indigenous-owned public charging stations.
- Alberta, the City of Calgary and the City of Edmonton released in March 2020 the publically available *Electric Vehicle Home and Workplace Charging Study* regarding policies for electric vehicle home and workplace charging which identified opportunities to accelerate the deployment of electric vehicle charging infrastructure.
- Alberta, in collaboration with Canada and the City of Edmonton, is investing in electric buses for Edmonton commuters. As a result of the Public Transit Infrastructure Fund, Alberta will have up to 50 electric buses in operation.
- Ontario's automotive sector is making large investments in electric vehicle manufacturing capacity with over $6 billion in investments announced recently.
- Ontario announced on October 8, 2020, that it is matching dollar for dollar $295 million in investment support by the federal government for a retooling of the Ford Motors Oakville Assembly Complex into a global hub for battery electric vehicle production.
- Ontario, the City of Guelph, and Canada is investing to purchase 65 electric transit buses and build a bus storage facility at a cost of $177 million, to support Guelph's transition to a zero-emission battery-electric fleet.

3.3 Transportation

Putting More Zero-Emission Vehicles On the Road

- In 2020, Quebec prepared a report on the implementation of the ZEV standard and work is underway to strengthen the standard over the coming years. The targets for ZEV sales are 30 per cent in 2030 and 100 per cent in 2035. The Government of Quebec also announced that it would ban the sale of new gasoline-fueled cars by 2035.
- Québec announced $3.6 billion over five years to support electrifying transportation systems and vehicles, and proposed to ban the sale of new gasoline-powered cars by 2035. This funding included the extension of the Electric School Bus Deployment Support Program from June 30, 2020 to March 31, 2021. In addition, this program will increase its budget to $18 million for the 2020-21 fiscal year, in order to accelerate the acquisition of all-electric school buses throughout Québec.
- In 2020, Nova Scotia committed $378,000 to fund Year 2 of the Next Ride Electric Vehicle Engagement campaign to provide information and EV test drive opportunities for Nova Scotians.
- In 2020, New Brunswick continued to develop a provincial electric vehicle strategy and work with Canada to expand its network of electric vehicle charging stations. By 2020, 26 electric vehicle fast-chargers and 58 Level 2 chargers were installed throughout the province. New Brunswick also completed its electric school bus pilot and is evaluating the results.
- Prince Edward Island announced that it would start transitioning the entire school bus fleet to electric and 12 electric school buses were purchased in 2020. Furthermore, Prince Edward Island's direct current (DC) Fast Charging network was completed in February 2020, providing Islanders with fast charging options at six locations across the Province.
- Newfoundland and Labrador's electricity utility regulator released a report on February 2, 2020 which concluded that appropriate electrification programs (including transportation) should be pursued by the province and the utilities. The province's largest private sector utility, Newfoundland Power, submitted a Conservation and Demand Management Plan for 2021-2025 in 2020, which includes provisions for further investments in charging infrastructure and vehicle incentives. Additionally, Newfoundland and Labrador announced on July 10, 2020 investments to build a 14-site fast-charging electric vehicle network from St. John's to Port aux Basques, and a site at Gros Morne National Park. Further expansion of the network to the Island peninsulas and Labrador is being explored.

3.0 Complementary Actions to Reduce Emissions

3.3 Transportation

Putting More Zero-Emission Vehicles On the Road	• In 2020, the Northwest Territories commissioned an electric vehicle charging infrastructure planning study. The study looked at where to place charging infrastructure on Northwest Territories' highways. The next steps include partnering with local utilities, securing funding, and beginning to deploy charging stations. Additionally, in 2020, the territory launched an electric vehicle and charging station rebate for new vehicles through the Arctic Energy Alliance.
Shifting From Higher-To-Lower Emitting Modes and Investing In Infrastructure	• Canada's Investing in Canada Infrastructure Program has announced two alternative fuel projects in 2020 for a total program contribution of $690,000. One of the projects will install approximately 28 Level 2 charging stations on Vancouver Island. • Canada is making significant investments to support the shift to lower-emitting modes of transportation and in supporting infrastructure. For instance, in 2020, there has been the addition of 365 new rail vehicles to increase baseload capacity in existing transit systems, 370 existing streetcars or rail coaches rehabilitated or enhanced, and 192 kilometres of new light rail tracks. • In December 2020, Canada announced that it would advance the federal government's commitment to help procure 5,000 zero-emission public transit buses and school buses, including by leveraging the Canada Infrastructure Bank. To support this goal, the Canada Infrastructure Bank's Growth Plan has earmarked $1.5 billion to expand and accelerate the adoption of zero emission buses. • Alberta's capital maintenance and renewal funding in 2020-21 was doubled from $937 million to $1.9 billion. In October 2020, a 12 kilometre portion of Tsuut'ina Trail, which forms part of Calgary's ring road, opened to traffic. • Saskatchewan approved a short line project for funding under the National Trade Corridor Fund. • Manitoba announced a 30 year blueprint and plan to develop the Winnipeg South Perimeter Highway to a freeway standard, by removing at-grade intersections and building lane capacity and reconstruction of major highway intersections through the application of innovative roundabout design solutions known for their relative environmental benefits to replace current traffic light-based designs.

3.0 Complementary Actions to Reduce Emissions

3.3 Transportation

Shifting From Higher-To-Lower Emitting Modes and Investing In Infrastructure

- Ontario released draft transportation plans for Southwestern Ontario in January 2020 and for Northern Ontario in December 2020 which encompass highway, potential rail, and public transit improvements. Work is underway to identify long term public transportation needs in all areas of the province, including the Greater Golden Horseshoe and Eastern Ontario.
- Ontario is also moving forward with four priority subway projects as part of its $28.5 billion subway plan for the Greater Toronto Area. On July 8, 2020 the *Building Transit Faster Act*, 2020 (BTFA) came into effect, providing a suite of new legislative measures that streamline project delivery and support the accelerated completion of the government's priority transit projects: the Ontario Line, the Yonge North Subway Extension, the Scarborough Subway Extension, the Eglinton Crosstown West Extension. The BTFA measures would also apply to any other Ontario priority transit project that is prescribed through regulation.
- On October 22, 2020, Ontario introduced the *Ontario Rebuilding and Recovery Act*, 2020, which aims to reduce barriers in the planning, design and construction of major infrastructure projects like highway and public transit networks and support the growth of transit-oriented communities.
- As a part of the Québec Infrastructure Plan 2020-2030, the province is allocating $15.8 billion to the public transit sector, a significant portion of which is earmarked for infrastructure improvements. Québec is planning or studying six projects aimed at implementing structuring systems for electric public transit in the urban regions of Québec City, Montréal, Longueuil, Chambly-Saint-Jean-sur-Richelieu, Laval and Gatineau.
- Québec's 2021-26 Implementation Plan, which accompanies its 2030 Green Economy Plan, includes measures aimed at increasing the supply of public transit services and supporting the electrification of city buses, school buses, private buses, and taxis.
- Québec's Intermodal Transportation Reduction or Avoidance Program, which aims to reduce or avoid GHG emissions generated by the transportation through intermodal projects (marine and rail services), was extended from April 9, 2019 until March 31, 2021.
- Nova Scotia's Connect2 program supports community projects in the areas of active transportation, clean fleets, and shared mobility. Connect2 is in its sixth round of funding (2020-21), providing $655,760 in grants to 14 clean transportation projects.

3.3 Transportation

Shifting From Higher-To-Lower Emitting Modes and Investing In Infrastructure

- With the support of Canada's Investing in Canada Infrastructure Program, Nova Scotia continued to invest in active transportation infrastructure though the Halifax Regional Centre All Ages and Abilities Bikeway Network Project that targets the completion of a 30 kilometre network of bicycle routes, with a focus on infrastructure in the downtown core.
- Nova Scotia has been successful in accessing National Trade Corridor Fund. To date, there have been five projects approved for a total investment of $212.4M for projects such as the Halifax Port Rail Shuttle, Windsor Street Exchange, Twinning HWY #104, Halifax Stanfield Air Cargo Logistics Facility, and Bridgewater Interchange HWY #103.
- New Brunswick continued to invest in innovative transportation infrastructure designs that consider environmental impacts in the decision-making process. The province adapted transportation infrastructure in some flood prone areas of the province (e.g., raising of Darlings Island road, river ferry landings).
- In 2020, Prince Edward Island announced the Provincial Active Transportation Fund, which represents $25 million over 5 years to support active transportation planning, infrastructure and awareness province-wide and funded 20 projects in its first year. For instance, the province has installed 34 km of paved shoulders on provincial highways in 2020, adding to the active transportation network.
- Prince Edward Island designed and constructed Canada's first displaced-left intersection. This intersection reduces vehicle idling times and increases the overall flow of traffic, reducing emissions.
- Yukon has continued to invest in safety and efficiency improvements on key trade and transportation corridors including National Highway System routes within the territory. It is also continuing research into adaptation techniques to deal with current and anticipated impacts from climate change including permafrost degradation and changing weather patterns.
- Northwest Territories is planning additional key transportation corridors, to shift from the higher GHG emissions air mode to road transportation. Among them, the construction of Tłicho All-Season Road progressed through 2020 with the road expected to open to traffic in the fall of 2021. New corridors will provide opportunities for hydro transmission, including the Taltson Hydro Expansion project, thereby encouraging and promoting the use of alternate fuel sources (including electricity) for electric vehicles.

3.0 Complementary Actions to Reduce Emissions

3.3 Transportation

Using Cleaner Fuels

- In June 2020, Canada engaged with industry, provinces and territories, and non-governmental organizations regarding updates to key regulatory design elements of the *Clean Fuel Regulations*. The proposed *Clean Fuel Regulations* was published in Canada Gazette, Part I, on December 19, 2020. The regulations would require liquid fossil fuel primary suppliers to reduce the carbon intensity (CI) of the liquid fossil fuels they produce in and import into Canada for use in transportation from 2016 CI levels by 2.4 gCO_2e/MJ in 2022, increasing to 12 gCO_2e/MJ in 2030.
- In December 2020, Canada released the Hydrogen Strategy for Canada, which sets out a path for integrating low emitting hydrogen across the Canadian economy, cementing hydrogen as a key piece of Canada's path to net-zero, while positioning Canada as a supplier of choice to the world for clean hydrogen and the technologies to use it. The strategy identifies economic and environmental opportunities across the country, with hydrogen contributing up to 30 per cent of Canada's energy mix, leading to up to 350,000 green jobs by 2050, with up to 190Mt in emissions reduction, with reductions coming from hard-to-abate sectors like heavy industry, resource extraction and processing, mining, and freight.
- British Columbia's Low Carbon Fuel Standard regulation was amended in July 2020 to require suppliers to decrease average life-cycle carbon intensity of transportation fuels to achieve a 9.1 per cent reduction in 2020 increasing 1.09 per cent per year to achieve the CleanBC 20 per cent reduction target in 2030.
- Alberta's Renewable Fuel Standard requires biofuel blending in gasoline (5 per cent) and diesel (2 per cent), was amended from January 1, 2020 to remove the expiry date of the regulation.
- In 2020, Saskatchewan continues to require diesel blends for sale in the province to contain at least 2 per cent renewable diesel, under the *Renewable Diesel Act* and associated regulations; and, for unleaded gasoline sold in the province to contain at least 7.5 per cent ethanol, per the *Ethanol Fuel Act* and associated regulations.

3.3 Transportation

Using Cleaner Fuels

- On January 1, 2021, Manitoba amended regulations under the *Biofuels Act* to gradually increase the use of renewable fuels in Manitoba. Ethanol in gasoline increased from the current 8.5 per cent to 9.25 per cent and will increase again to 10 per cent on January 1, 2022. Similarly, the biodiesel content in diesel fuel increased from the current 2 per cent to 3.5 per cent and will increase again to 5 per cent on January 1, 2022. In addition, the existing northern exemption for biodiesel will be extended and a northern exemption for ethanol will be re-introduced. These northern exemptions are consistent with past and current regulations, and will be in effect for two years until expiring on December 31, 2022.
- In 2020, Ontario created the *Cleaner Transportation Fuels regulation* to increase requirements for renewable content in gasoline while maintaining requirements for diesel. The new regulation requires fuel suppliers to blend renewable content in regular-grade gasoline at 11 per cent in 2025, 13 per cent in 2028 and 15 per cent in 2030. Going forward, Ontario may move forward with opportunities in the production of low-carbon hydrogen to enhance opportunities for end uses across the economy.
- Québec's draft regulation on the minimum volume of renewable fuel in gasoline and diesel fuel was pre-published in the Gazette officielle du Québec on October 2, 2019. The regulation is intended to set standards for the blending of renewable fuel into gasoline and diesel fuel. The draft regulation was in the process of being amended in 2020.
- New Brunswick continues to work with the federal government to monitor technological advancements in the alternative fuels for the long-haul trucking sector.
- Yukon committed, in its new climate change, energy and green economy strategy, Our Clean Future, to establish blending requirements for fuels by 2025 aligned with leading Canadian jurisdictions.
- Northwest Territories continued to participate in meetings of the Clean Fuels Regulation Federal/Provincial/Territorial Working Group. In the context of this Working Group, the Northwest Territories is monitoring developments regarding the key regulatory elements of the federal *Clean Fuel Regulation*.
- Nunavut sources only high-quality fuel products for distribution, including Ultra-Low Sulphur Diesel with a Cloud Point of -43°C for motive, heating, and power generating applications, as well as Premium Winter Grade 3 Gasoline at 92 Octane.

3.0 Complementary Actions to Reduce Emissions

3.4 Industry

Reducing Methane and HFC Emissions

- Canada's first requirements under the federal methane regulations came into force on January 1, 2020. These regulations do not apply in the provinces of British Columbia, Alberta and Saskatchewan, for which equivalency agreements are in place that will allow for the provincial regulations to continue in the respective jurisdictions.
- Canada launched the $750 million Emissions Reduction Fund (ERF) to help industry adopt green solutions with a focus on methane, while retaining jobs in the sector. The ERF complements federal and provincial methane regulations to support Canada's commitment to reduce methane emissions from the oil and gas sector by 40-45% below 2012-levels, by 2025.
- Canada's *Ozone-depleting Substances and Halocarbon Alternatives Regulations*, introduced in January 2020, brought in new prohibitions on certain refrigeration equipment.
- British Columbia's new provincial methane regulations came into effect on January 1, 2020. British Columbia also established the multi-stakeholder BC Methane Emissions Research Collaborative, and continued supporting overall methane reductions.
- Alberta introduced key updates to methane regulation directives and brought into effect the Methane Emission Reduction Regulation in January 2020.
- Alberta continued funding emissions reduction projects and announced $25 million to support industry to install methane-related emissions reduction equipment, as well as $27 million to conduct detailed assessments of methane reduction opportunities and fugitive emissions.
- Saskatchewan continued to work towards the implementation of the Methane Action Plan (MAP), a comprehensive approach of policies, programs and regulations aimed at reducing GHG emissions from methane venting and flaring in Saskatchewan's upstream oil and gas sector. Annual progress reporting on all MAP commitments, targets, programs and policies is planned to commence beginning in 2021.
- Manitoba's Efficiency Manitoba introduced their first three-year plan to assist businesses and customers across Manitoba in reducing their use of electricity and natural gas.
- New Brunswick continued to regulate halocarbons, including HFCs, through the Ozone Depleting Substances and Other Halocarbons Regulation.
- Canada and Newfoundland and Labrador continued developing regulations to regulate methane emissions that will mirror *Canadian Environmental Protection Act* regulations for the offshore petroleum industry.

3.0 Complementary Actions to Reduce Emissions

3.4 Industry

Improving Industrial Energy Efficiency	• Canada announced the launch of a Net-Zero Challenge for Large Emitters, and, in addition to the challenge, Canada announced the Strategic Innovation Fund Net-Zero Accelerator, with an investment of $3 billion over five years. This investment will support decarbonization and drive the immediate creation of well-paying, resilient jobs. • Canada continued implementation and funding of various programs and projects such as the Energy Manager Program and energy management information systems. • British Columbia and Canada continued to jointly fund the implementation of ISO 50001 energy management systems. • British Columbia continued to implement its Technology and Innovation Policy Framework in 2020, and the Emerging Economy Task Force released its final report in March 2020. • Alberta announced that it will provide $55 million, with support from the federal Low Carbon Economy Fund, to Emission Reduction Alberta's Energy Savings for Business program to help Alberta's small and medium-sized facilities benefit from emissions-reducing industrial and commercial projects. Alberta's Oil Sands Innovation Challenge, supported by Emissions Reduction Alberta, completed or continued funding 8 projects. • Ontario's Independent Electricity System Operator held its first capacity auction in December 2020 for the Summer 2021 commitment period (from May 1 to October 31, 2021), while Ontario's Process and Systems Upgrade program expired in December. • Ontario's largest natural gas distributors continued to offer conservation programs for their industrial consumers under the 2015-2020 natural gas conservation framework to increase process efficiencies, and the Ontario Energy Board approved a 2021 Demand Side Management Transition Plan submitted by Enbridge Gas Inc. • Québec announced a $670 million investment to support energy efficiency and conversion, as well as process optimization in businesses, which includes a $90 million investment for a GHG challenge for large industrial emitters. • New Brunswick's electric power utility company, NB Power, continued to offer and enhance programs for industrial facilities to improve energy efficiency in buildings and equipment based on energy management systems. • Newfoundland and Labrador continued to implement the *Management of Greenhouse Gas Act*. Through the federal Low Carbon Economy Leadership Fund, Newfoundland and Labrador continued providing funding for a Climate Change Challenge Program to reduce GHG emissions.

3.0 Complementary Actions to Reduce Emissions

3.4 Industry

Improving Industrial Energy Efficiency	• Northwest Territories continued promoting the Buildings and Industry component of the Greenhouse Grant Program.
Investing In Technology	• Canada led research projects that will generate the technical evidence required to support legislative and regulatory approaches to reducing GHG emissions, and to promote the adoption of clean technologies across several modes of transportation, measure and evaluate technologies to increase fuel efficiency for the marine, aviation and rail sector. • Canada announced that it would begin to use proceeds collected from the OBPS for industry to further support industrial projects to cut emissions and use new cleaner technologies and processes, as part of the plan to decarbonize industrial sectors in 2021. • Canada announced it would develop a comprehensive carbon capture, use and storage strategy and explore opportunities to help keep Canada globally competitive in this growing industry. • Canada announced that it would invest $1.5 billion in a Clean Fuels Fund to support the production and distribution of low-carbon fuels (e.g., hydrogen, biocrude, renewable natural gas and diesel, cellulosic ethanol) in a manner that complements federal carbon pollution pricing, regulatory efforts, and other federal programming, establish biomass supply chains, and develop enabling codes and standards supporting the Clean Fuel Standard, and early actions outlined in the Hydrogen Strategy for Canada. • British Columbia established three programs in May of 2020: the Dormant Sites Reclamation Program, Orphan Sites Supplemental Reclamation Program, and Legacy Sites Reclamation Program, which are receiving up to $120 million in total federal funding. • Alberta announced the $100 million Industrial Energy Efficiency and Carbon Capture Utilization and Storage Grant Program, as part of the Economic Recovery plan. • Alberta hosted five finalists under the NRG COSIA Carbon XPRIZE, a $20 million prize awarded to innovations that allow products to be made of carbon dioxide. • Saskatchewan continued providing funding to a number of research institutes and R&D initiatives.

3.0 Complementary Actions to Reduce Emissions

3.5 Forestry, Agriculture, and Waste

Investing In Technology	• New Brunswick initiated a new project on benchmarking several commodities for GHG emission and carbon capture.
Increasing Stored Carbon	• Canada and the provinces and territories continued collaborating with academia on various research projects assessing climate change impacts on timber resources, performing regional vulnerability assessments, and pest outbreaks. • Canada allocated $3.9 billion to the new Natural Climate Solutions Fund, which aims to increase carbon sequestration with various co-benefits by expanding Canada's natural assets, including planting 2 billion additional trees over the next decade. This includes a proposal to provide an additional $98.4 million over ten years, starting in 2021-22, with $1.6 million in remaining amortization, to Agriculture and Agri-Food Canada to establish a new Agricultural Climate Solutions program. The program is intended to help develop and implement farming practices, such as shelterbelts or cover crops, to tackle climate change by storing carbon and reducing greenhouse gases. The program will establish a Canada-wide network of regional collaborations bringing together producers, scientists, and other sectoral stakeholders to co-develop and share natural solutions and farming practices for sustainability and competitiveness. In the 2020 Fall Economic Statement, Canada announced up to $3.2 billion over 10 years to deliver on a commitment to plant two billion trees. This effort is part of an overarching $4 billion approach to use nature-based climate solutions to fight climate change by expanding Canada's natural assets and increasing carbon sequestration while providing co-benefits such as improved air and water quality, increased community resilience to wildland fire, and supporting species at risk. • Canada continued funding efforts to increase stored carbon throughout the country through the Low-Carbon Economy Fund's Challenge and Leadership streams. British Columbia's Forest Carbon Initiative (FCI) agreement with the Low Carbon Economy Fund was extended to 2023-24, and the province continued implementing FCI activities. • British Columbia continued investing in the Environmental Farm Plan and Farm Adaptation Innovator Programs and a UBC Sustainable Agriculture Landscapes Lab project, both focused on carbon sinks. • Alberta continued funding and implementing programs related to forest growth and reforestation, the Pine Beetle Strategy, Land-Use Framework planning, and the Caribou Habitat Recovery Program.

3.0 Complementary Actions to Reduce Emissions

3.5 Forestry, Agriculture, and Waste

Increasing Stored Carbon	• Manitoba initiated projects related to peatland carbon stocks and transportation route shelterbelts, and continued forest surveying work. Manitoba continued monitoring carbon sequestration potential from short-rotation forestry plantation. • Manitoba's Ag Action Manitoba – Assurance: Beneficial Management Practices (BMP) Activity approved 57 projects, committing over $500,000 in funding to enhance environmental performance including carbon sequestration. Manitoba's Ag Action Manitoba – Assurance: Watershed Ecological Goods and Services (EGS) Activity also approved 20 projects, committing $1.06 million in funding to enhance EGS from working agricultural lands, including carbon sequestration. • Ontario continues to support carbon storage in forests and harvested wood products through adaptive management of the Policy Framework for Sustainable Forests, including a new seed transfer policy; to share information and report on forest carbon balances; and to invest in research and monitoring, including an enhanced forest inventory. • Québec released their Wood Production Strategy, in partnership with Indigenous communities and other stakeholders, and announced new 5-year/$75 million and 6-year/$82.2 million funding streams for additional silviculture work to sequester carbon. • Québec funded adaptive knowledge development programs and continued implementing carbon sink projects. • New Brunswick incorporated a process to estimate carbon supply into stand level growth and yield development. • Prince Edward Island continued adding land to their natural areas network, bringing the current total to 3.6 per cent, and continued enrolling clients in the Carbon Capture Tree Planting Program. • The Northwest Territories' boreal forest is being measured as a carbon sink under the Multisource Vegetation Inventory program that aims to complete stable assessments of both above and below ground forest carbon.
Increasing the Use of Wood For Construction	• Canada and the Atlantic Provinces continued supporting the Atlantic Woodworks Initiative, which promotes wood as a preferred building material in Atlantic Canada. • Canada continued supporting the Green Construction through Wood Program, having allocated $38 million through 25 contribution agreements to organizations across Canada and leveraging over $1.3 billion in wood research, education, and construction activity to date.

3.0 Complementary Actions to Reduce Emissions

3.5 Forestry, Agriculture, and Waste

Increasing the Use of Wood For Construction	• British Columbia continued working toward increasing the use of low carbon and renewable materials in all public sector infrastructure projects and established an Office of Mass Timber Implementation. • British Columbia continued the Forestry Innovation Investment Wood First and Early Adopter Programs. • Ontario continued promoting the use of wood for construction through the Forest Sector Strategy and the Made-in-Ontario Environment Plan and the Housing Supply Action Plan, and continued development of a new cross-laminated timber facility. • Québec continued implementation of the Continuous Training, Wood Construction Demonstration, and Wood Prefabrication Programs, and continued development of a more ambitious version of the Wood Charter. • New Brunswick continued implementing their Wood in the Construction of Public Buildings and Infrastructure Policy.
Generating Bioenergy and Bioproducts	• First Nations communities across Canada continued to develop and operate biomass energy projects, with support from Canada. For example, the $220 million Clean Energy for Rural and Remote Communities (CERRC) program has supported projects with the Nunatsiavut Government in Newfoundland and Labrador, Mee-Toos Forest Products Ltd. in Saskatchewan, Tulita Land Corporation in Northwest Territories, and Lhoosk'uz Dené Nation in British Columbia. • Through CERRC, Canada continues to help communities across the country to reduce their reliance on diesel fuel used for heat and power by supporting transitions to biomass heating and combined heat and power systems for community or industrial applications. • Canada finished accepting projects for the Agricultural Clean Technology Program, with 12 projects being approved for funding. • British Columbia continued funding bioproducts, biogas, and clean technology development under the Agri-Innovation Program, and continued developing a new Forest Biomass Supply Information System to support high-value bioproducts development. • British Columbia continued supporting organics processing infrastructures through the Organics Infrastructure Program with support from Canada through the Low Carbon Economy Leadership Fund, and began research on bioenergy and biofuels to support development of the forthcoming BC Bioenergy Strategy.

3.0 Complementary Actions to Reduce Emissions

3.5 Forestry, Agriculture, and Waste

Generating Bioenergy and Bioproducts

- Alberta continued generating carbon offsets through the Alberta Carbon Offset System, and continued supporting various industry bioenergy and bioproduct projects from LaFarge Cement and Tolko Industries, among others.
- Alberta continued supporting over 60 biomass-related projects and other forestry-related projects through Alberta Bio Futures and Emissions Reduction Alberta, respectively.
- Saskatchewan's SaskPower utility began construction of a biomass power plant, to help increase electricity generation supply.
- Ontario began development of Forest Biomass Action Plan and continued supporting the use of renewable forest biomass through the Made-in-Ontario Environment Plan.
- Ontario initiated multiple biochar and pulp projects with industry partners, and the province posted proposed amendments to the regulations for combined heat and power systems that use wood biomass as fuel for public comment.
- Québec continued implementation of the 2018-2023 Development Strategy for Québec's Forest Products Industry and continued providing support for programs and initiatives to promote and increase the use of biofuels and biomass.
- Nova Scotia continued its investigation of the potential for heating government buildings with woodchip-based heating systems.
- New Brunswick, under guidance of the Biomass Policy, continued investing in large-scale projects for the production of bioenergy and/or biofuels. For example, New Brunswick awarded a contract for the installation of a wood pellet boiler system at Upper River Valley Hospital to eliminate an estimated 440,000L of fuel oil consumption annually.
- Prince Edward Island continued expanding the use of biomass heat in public buildings, with an additional 17 buildings converted in 2020.
- Yukon set up an interdepartmental working group to collaborate on harvesting and biomass supply opportunities, and continued other projects and studies related to biomass. Yukon also continued supporting biomass projects in three First Nations communities.
- Yukon continued to provide funding for biomass capacity development, biomass research and biomass heating systems to provide economic benefits for Yukon First Nations through the Yukon Biomass Energy Strategy. The second of two interactive workshops with the biomass industry was held in June 2020.

3.0 Complementary Actions to Reduce Emissions

3.5 Forestry, Agriculture, and Waste

Generating Bioenergy and Bioproducts	• Northwest Territories, through Capital Asset Retrofit Fund funding, saw a large-scale biomass system installed at the Stanton Legacy Building in Yellowknife.
Advancing Innovation in GHG-Efficient Management Practices in Forestry and Agriculture	• Governments continued providing funding for GHG emission-reducing projects and programs through the Canadian Agricultural Partnership. • Atlantic Provinces continued an early intervention strategy to control wide-scale outbreaks of spruce budworms, associated with forest-level defoliation and dying trees. Based on research led by the Canadian Forest Service, New Brunswick and Newfoundland and Labrador have successfully deployed this treatment program which could become the first viable option for avoiding an outbreak from one of Canada's most significant forest pests. • Canada continued funding projects through the Agricultural Greenhouse Gases Program, intended to enhance the understanding and accessibility of agricultural technologies, beneficial Management Practices, and processes that can be adopted by farmers to mitigate agricultural GHG emissions in Canada. • British Columbia continued investing in the Beneficial Management Practices Program and the Agri-Innovation Program, both of which fund development of practices that reduce GHG emissions from farming practices. • Saskatchewan's Forest Management Planning system has approved five forest management plans, and the three original assisted migration trials were measured and assessed in 2020. • Manitoba's Prairie Agricultural Machinery Institute (PAMI) is researching and testing the displacement of fossil fuels with renewable energy for in-bin drying of grains. • Manitoba approved 27 projects under the MB Ag Action – Research and Innovation Activity. Research results will contribute to the development of agricultural knowledge and skills, and improve the competitiveness and sustainability of Manitoba's agriculture, agri-food, and agri-products sectors. • Ontario continued implementation of the 10-year Forest Sector Strategy to grow Ontario's forest sector, create opportunities for Ontario families, support industry and encourage innovation and new investment, while ensuring the sustainability of Ontario's forests. • Ontario updated their AgriSuite tool with a new GHG calculator, and continued to fund research and innovation programs.

3.0 Complementary Actions to Reduce Emissions

3.5 Forestry, Agriculture, and Waste

Advancing Innovation in GHG-Efficient Management Practices in Forestry and Agriculture	• New Brunswick funded innovation and research efforts with climate change mitigation potential, included three on-going projects on precision nutrient placement and one project each on nitrogen fixing bacteria and cover crops. • Prince Edward Island's Federation of Agriculture examined opportunities to reduce the GHG emissions, or increase carbon storage, in the agricultural sector in the province. • Newfoundland and Labrador's Department of Fisheries, Forestry and Agriculture continued to support research into clean growth and climate change, including anaerobic digestion technology.

3.6 Government Leadership

Setting Ambitious Targets	• Canada set, in December 2020, a new target for its Greening Government Strategy to achieve net-zero emissions by 2050 and expanded the scope for Canada's emissions reductions target for government operations beyond just real property and vehicle fleet, to include procurement of goods and services, air travel, commuting and national safety and security operations. • Canada updated its GHG inventory in November 2020, and released data showing that Canada has reduced GHG emissions by 34.6 per cent for federal buildings and conventional fleet for fiscal year 2019-20 from 2005-06 levels. • British Columbia achieved net-zero emissions across all 125 provincial public sector organizations for the 10th consecutive year. • British Columbia provided $50 million to the provincial public sector through the Carbon Neutral Capital Program to reduce emissions and create additional savings from energy efficiencies. • Saskatchewan achieved BOMA BEST standards for 45 operational government buildings, the Canadian industry standard for commercial building operational sustainability certification. • Manitoba continued work to establish corporate capacity for government operations to track GHG emissions and activities, all supporting its low carbon government mandate. • Ontario continued undertaking significant retrofits to its core government buildings through the Macdonald Block Reconstruction Project. • Québec launched a community of practice in 2020 to promote leadership by example, organize government organizations and promote synergies in the area of energy transition, informed by the action plan for achieving energy transition targets developed by the province.

3.0 Complementary Actions to Reduce Emissions

3.6 Government Leadership

Setting Ambitious Targets	• New Brunswick's commitment to carbon-neutral government operations by 2030 received further guidance through the Pathway to Carbon Neutral Government study. • Prince Edward Island continued work to reduce emissions associated with government operations, such as appointing departmental climate change coordinators, implementing a climate lens for cabinet submissions, and developing a GHG emissions inventory for government operations. • Newfoundland and Labrador continued to construct provincially-funded buildings to high energy efficiency and environmental standards, develop environmental procurement policies, divert waste, and other environmental policies in the workplace. • Yukon submitted corporate emissions data from 2010 and 2015 to the Climate Registry for verification, which will assist with tracking progress toward the territory's 2030 target.
Cutting Emissions From Government Buildings and Fleets	• Nova Scotia and Canada continued to work together to add more clean, renewable electricity in the province to power federal facilities in order to help the federal government reach its goal of using 100 per cent clean electricity in all federally owned facilities by 2025. • Canada's Greening Government Strategy was updated in December 2020, with enhanced focus and shortened timelines to reach net-zero carbon and climate-resilient government operations, while also reducing other environmental impacts. As of 2019-2020, government GHG emissions have been reduced by 34.6 per cent below 2005 levels. • Canada's Greening Government Services and Greening Government Strategy Fleet Programs continued providing support to departments for projects geared at reducing emissions from federal buildings and fleets • British Columbia continued to develop policies to help meet new public sector emission reduction targets, and continued to invest significantly in clean technology and innovation in government operations through providing new funding streams and strategy development. • Alberta expected facilities to provide solar electricity to government buildings to begin construction in the spring of 2020 and come online in 2021, but COVID-related delays in supply chains pushed projects back to 2021. However, installations of new solar energy systems continued on some government buildings.

3.6 Government Leadership

Cutting Emissions From Government Buildings and Fleets

- Saskatchewan maintained efforts to minimize the environmental impact of government vehicles by right-sizing the fleet, and its Central Vehicle Agency also evaluated government vehicles for lower-carbon technology opportunities.
- Manitoba developed a Low Carbon Government Office to support the development and implementation of policies, strategies and initiatives aimed to reduce greenhouse gas emissions and promote sustainable operations within provincial government departments and its reporting entities.
- Manitoba reduced its vehicle fleet by 465 units, exceeding its commitment to remove 400 vehicles from the fleet.
- Québec announced its goal to accelerate the pace of installation of charging stations in its own buildings and that in 2030 the government's building stock will have reduced its GHG emissions by 60 per cent compared to 1990.
- Nova Scotia amended its *Electricity Act* to enable the Green Choice Program, which will allow larger customers, like federal facilities in Nova Scotia, to choose 100 per cent renewable energy for their operations.
- New Brunswick invested $6.6 million in new energy efficiency programs for government operations, which included $2 million from Canada's Climate Action Incentive Fund. Multiple hospital and school energy management programs achieved ENERGY STAR® Certification.
- Prince Edward Island built seven new biomass plants that will provide service to twelve government buildings.
- Newfoundland and Labrador, through Canada's Low Carbon Economy Leadership Fund, provided funding to improve energy efficiency and to fuel switch provincial public buildings and retrofit trucks and snowplows.
- Newfoundland and Labrador continued to roll out dedicated funding to support energy efficiency and fuel switch retrofits in approximately 50 public sector buildings reliant on fossil fuels for space heating.
- Yukon committed that half of all new cars purchased for the government fleet each year will be zero emission beginning in 2020.
- Yukon commenced the design of biomass heating systems at two elementary schools, and in 2020, set a target to reduce emissions from Government of Yukon buildings by 30 per cent by 2030, compared to 2010.
- Northwest Territories allocated $3.8 million in 2020 to undertake nine different energy conservation retrofits initiatives on 12 government buildings through its Capital Asset Retrofit Fund.

3.0 Complementary Actions to Reduce Emissions

3.6 Government Leadership

Cutting Emissions From Government Buildings and Fleets	• Nunavut continued retrofitting existing Nunavut-owned facilities territory-wide, using traditional and innovative technologies to improve energy efficiency and energy consumption.
Scaling Up Clean Procurement	• Canada, under its Greening Government Strategy, continued developing plans to power federal buildings with 100 per cent clean electricity by 2022, where available, and Canada is exploring measures that support the conversion of government fleets to zero-emission vehicles. • Nova Scotia continued to implement its Sustainable Procurement Policy, most recently with a pilot diversity project starting in 2020 in the area of community benefits in infrastructure projects and other initiatives to obtain added value through inclusive economic development.

3.7 International Leadership

Delivering on Canada's International Climate Finance Commitments	• As of November 2020, Canada has announced more than $2 billion of its $2.65 billion climate finance commitment and delivered $1.77 billion to support developing countries' transitions to low-carbon and climate-resilient economies and mobilize private sector financing for climate action. As part of this commitment, Canada contributed $250 million to the Canada-International Finance Corporation Blended Climate Finance Program, $223.5 million to the second phase of the Canadian Climate Fund for the Private Sector in the Americas and $200 million to the second phase of the Canadian Climate Fund for the Private Sector in Asia. In 2020, Canada also announced $20 million for the Canada-CARICOM Climate Adaptation Fund to provide disaster risk insurance to Caribbean countries and $150 million for the International Fund for Agricultural Development to support climate-smart agriculture in developing countries. • In 2020, Québec invested nearly $9.5 million in 15 additional International Climate Cooperation Program projects for GHG emission reduction and adaptation to climate change impacts efforts in Francophone countries that are the most vulnerable to climate change impacts.

3.0 Complementary Actions to Reduce Emissions

3.7 International Leadership

Acquiring Internationally Transferred Mitigation Outcomes	• In April 2020, UNFCCC announced the postponement of COP26 from fall 2020 to 2021 in light of the ongoing, worldwide effects of COVID-19. Throughout the year, Canada participated in a series of virtual dialogues to maintain momentum and advance technical work across the international climate change agenda, including on Internationally Transferred Mitigation Outcomes (ITMOs) and Article 6. • Canada is still considering the potential role of ITMOs to complement its domestic emission reduction efforts and has also developed a set of high-level principles to guide possible future implementation of Article 6 of the Paris Agreement and use of ITMOs. • In the meantime, Canada will continue to insist on strong international rules for ITMOs to ensure environmental integrity, transparency and the avoidance of double-counting, consistent with Article 6 of the Paris Agreement. • Looking forward to COP26 in November 2021, Canada is committed to working closely with Parties with the goal of reaching an agreement on Article 6 to ensure credible and efficient international carbon markets.
Engaging in Trade and Climate Policy	• Canada continued ongoing trilateral cooperation through the Canada-US-Mexico Agreement (CUSMA), the parallel Environmental Cooperation Agreement, and the Commission for Environmental Cooperation. Canada continued discussions on the relationship between trade and climate change through bilateral forums such as the Canada-EU High-Level Dialogues on Climate Change, and ongoing meetings of the Trade and Sustainable Development Committee under the Canada-EU Comprehensive Economic and Trade Agreement (CETA). In December 2020, Canada hosted a Dialogue on Green Recovery from COVID-19 between Comprehensive and Progressive Trans Pacific Partnership members. • In fall 2020, Alberta provided initial feedback into the European Commission's Public Consultation Process on their proposed Carbon Border Adjustment Mechanism (CBAM). • Manitoba and Ontario continued to provide input into federal efforts to include references to climate change and strong climate change language in international trade negotiations. • In 2020, Ontario continued to work with the federal government to share industry intelligence and advocated for the removal of tariffs on solar panels manufactured in Ontario and exported to the U.S. (Section 201 tariffs). • In 2020, the Northwest Territories provided input to the Carbon Disclosure Project, continuing participation as a signatory of the Under2 Coalition.

4.0 Adaptation

4.1 Translating Scientific Information and Traditional Knowledge Into Action

Providing Authoritative Climate Information

- Canada published *Climate Science 2050: Advancing Science and Knowledge on Climate Change*, a national synthesis report that supports better understanding of the breadth of climate change science and knowledge needs that exist in Canada.
- Canada committed to develop the country's first National Adaptation Strategy with provincial, territorial, and municipal governments, Indigenous Peoples, and other key partners. The strategy would establish a shared vision for climate resilience, identify key priorities for increased collaboration, and establish a framework for measuring progress at the national level.
- Canada began work on a voluntary Indigenous Community-Based Climate Monitoring Guidance document that will support both northern and southern Indigenous communities to monitor local climatic conditions over time in a consistent manner.
- Federal, provincial, and territorial governments advanced work to develop regional climate organizations. This included work to build support and plan for a Northern climate organization, the planning and development of ClimateWest (a regional climate organization in the Prairie provinces), and inviting organizations to apply to serve as the regional climate services organization in Atlantic Canada.
- The Canadian Centre for Climate Services, in collaboration with the network of regional climate organizations, updated ClimateData.ca by adding useful climate information to support adaptation decision-making. The site includes:
    - A new Health Sectoral Module, where information is packaged in a way to support health-related decisions;
    - A new Learning Zone, which includes training resources on the application of climate information in decision-making; and
    - A new analysis tool, where users can determine their own climate variable thresholds.
- A central repository of climate-resilient codes and standards documents was added to the CCCS website.
- The CCCS advanced the development of an interactive map (launched in June 2021) of Canadian climate adaptation examples to support decision-making in this space. Visitors to the Map at ChangingClimate.ca are able to search hundreds of examples of climate change adaptation actions in an interactive and user-friendly fashion, refining their search using filters and keywords. The Map increases access to critical information and provides peer-to-peer learning opportunities.

4.0 Adaptation

4.1 Translating Scientific Information and Traditional Knowledge Into Action

Providing Authoritative Climate Information	• Following the completion of their Preliminary Strategic Climate Risk Assessment report in 2019, British Columbia has worked to improve its forecasting and analysis, including representing risks at regional levels and exploring ways to uphold Indigenous values in climate risk assessments. • Saskatchewan released its second annual Resilience Report in June 2020 that reported on 25 resilience measures across five key areas: natural systems, physical infrastructure, economic sustainability, community preparedness and human well-being. • Manitoba was part of an innovative AquaHacking challenge involving Lake Winnipeg. Financial contributions were provided to the International Institute for Sustainable Development to coordinate the project. • In August 2020, Ontario began work on a multi-sector climate change impact assessment that will evaluate how climate change is expected to impact the province by region and key areas, including business and the economy, people and communities, natural environment, food and agriculture and infrastructure. • Ontario released a new Tree Seed Transfer Policy (2020) supported by information and mapping tools for implementation to ensure that seed used to regenerate forests has a good chance of producing trees that are adapted to their growing environment now and in the future • The website for viewing climate scenarios for Québec (the "Climate Portraits" section of ouranos.ca), which has been online since 2018, was updated in July 2020. New climate indices were calculated, specifically heat waves (duration/frequency), solid and liquid precipitation amounts, and a frost index. • Nova Scotia commissioned a climate impacts study in support of the province-wide risk assessment, which includes updated climate projections; work began in fall 2020. • New Brunswick signed a memorandum of understanding with the Canadian Centre for Climate Services and the other Atlantic provinces to collaborate and support establishing the Atlantic Hub to provide regionally tailored climate services. • In September 2020, Newfoundland and Labrador released a user-friendly guide on how to interpret coastal erosion data for 139 sites across the province, and ways to incorporate that into a policy decision-making process. The province also released a new interactive website to provide further accessibility for communities, private, and non-profit entities to localized data.

4.0 Adaptation

4.1 Translating Scientific Information and Traditional Knowledge Into Action

Providing Authoritative Climate Information	• In 2020, Yukon continued to collaborate with Yukon University to deliver the Climate Change Information Mainstreaming Program (CCIMP). Through this program, YukonU produced an annual Compendium of Yukon Climate Change Knowledge, which makes recent climate change work in and relevant to Yukon and Canada more accessible to the general public, governments, organizations, students, researchers, the scientific community and others. • In 2020, the Yukon government launched a Youth Panel on Climate Change. The panel's mandate includes engaging with young people across Yukon on issues related to climate change and providing advice and perspectives on the Yukon government's climate change actions. • The Northwest Territories, Yukon and Nunavut collaborated with the Canadian Centre for Climate Services to build support for a Northern climate organization.
Building Regional Adaptation Capacity and Expertise	• Canada invested in the Building Regional Adaptation Capacity and Expertise (BRACE) Program, increasing the capacity of small to medium sized enterprises, organizations, professionals and communities to undertake climate change adaptation action. BRACE continued to support 18 collaborative adaptation projects in 2020. British Columbia completed Regional Adaptation Strategies for several regions, including the Vancouver Island Adaptation Strategies plan in July 2020. • The British Columbia Regional Adaptation Collaborative, in partnership with Canada, delivered one regional workshop and two community workshops and ran a pilot and first round of virtual training with communities as a replacement to in-person community workshops. • Supported by the Government of British Columbia and the BRACE Program, Royal Roads University continued to deliver continuing professional development focused on climate adaptation and to manage a climate adaptation professional Learning Network. • With support from the Prairies Regional Adaptation Collaborative, Alberta undertook a study to assess potential crop suitability in a changing climate. Climate projections were used in the Agriculture Crop Adaptation Atlas and Database, a crop suitability model developed by Alberta Agriculture and Forestry, to investigate potential changes in the suitability of agro-climatic conditions for five crops. Phase 1 of the report was completed in 2020.

4.0 Adaptation

4.1 Translating Scientific Information and Traditional Knowledge Into Action

Building Regional Adaptation Capacity and Expertise	• In 2020, the new Saskatchewan Public Safety Agency (SPSA) continued to offer guidance on emergency planning to communities, including delivery of basic emergency management courses, Incident Command Systems training, and the "10 steps to emergency planning" training module. The SPSA also has dedicated a position to manage and coordinate Indigenous engagement and initiatives that create increased opportunity to offer the same guidance on emergency planning to First Nation communities. • Under the federal BRACE Program, Saskatchewan's Water Security Agency continued to enhance the capacity of agricultural producers and professionals (engineers, aerologists, applied science technologists) to address climate change and water management, by incorporating adaptation actions and strategies into the design and development of agricultural drainage. • In October 2020, Manitoba commenced the implementation of the next phase of "Climate Resiliency Capacity Building for Manitoba Decision Makers", (now called "Manitoba Climate Resilience Training Project") under the federal BRACE Program. • The federal BRACE program continues to support the Laurentian University project on "Building climate change adaptation capacity of First Nations in far northern Ontario through knowledge exchange and collaboration." • As part of the Prairies Regional Adaptation Collaborative, and in partnership with Canada, Saskatchewan, Alberta, and Manitoba, undertook activities to create a community of adaptation practitioners in the Prairies. • Ontario established an Advisory Panel on Climate Change in 2019 to provide expert advice on the implementation of climate change actions and how Ontarians can prepare for the costs and impacts. In 2020, the Panel held six meetings with government ministries and stakeholders to explore topics of climate resilient communities, homes, and infrastructure. • In August 2020, Ontario began work on a multi-sector climate change impact assessment that will evaluate how climate change is expected to impact the province by region and key areas including business and the economy, people and communities, natural environment, food and agriculture and infrastructure. • Supported by Québec and the federal BRACE program, Laval University is working with a number of partners including the Ouranos Consortium, l'Ordre des ingénieurs du Québec, l'Ordre des urbanistes du Québec and l'Ordre des architectes du Québec to begin developing a training program on climate change adaptation for engineering, architecture, and urban planning professionals.

4.0 Adaptation

4.1 Translating Scientific Information and Traditional Knowledge Into Action

Building Regional Adaptation Capacity and Expertise

- Québec launched the Climate Municipalities Program–Phase 2, which aims to strengthen municipal organizations' resilience to climate change, in 2018. The program has a $40 million budget and funds analyses or studies and pilot projects for combating climate change. When the program closed in 2020, 18 studies and 21 pilot projects related to climate change adaptation were approved for funding and are being carried out by Québec municipalities.
- In 2020, Nova Scotia continued implementing their climate adaptation strategy focused on staff education and awareness, developing a climate lens for programs, minimizing climate related disruptions, climate data, and industry preparedness.
- Nova Scotia is undertaking the development of a provincial climate change risk assessment as a systematic way to identify climate change risks and opportunities relating to elements important to the wellbeing of Nova Scotia, to be completed by March 2022.
- New Brunswick's work under Canada's BRACE program included developing and delivering climate change adaptation training, education, and professional development for engineers, planners, NGOs, and woodlot owners, as well as establishing a natural infrastructure community of practice to promote the use of nature-based solutions.
- Under the federal BRACE program, PEI is enhancing adaptation capacity in local host organizations through a provincial internship program, and is supporting the delivery of climate change training opportunities for early- and mid-career professionals.
- A province-wide climate risk assessment is under way in PEI. It is focused on identifying and prioritizing key risks based on the best available science.
- Newfoundland and Labrador committed to invest $100,000 towards Memorial University's Harris Centre's Climate, Economy and Society Initiative, which will explore how to address climate change impacts as the province recovers from the effects of the COVID-19 pandemic.
- In partnership with Canada, Yukon continued to deliver 13 adaptation projects, including a Yukon-wide risk assessment initiated in 2020. The Yukon Climate Risk Assessment will build an understanding of climate resilience in the Yukon, assess where community strengths and capacity exists to respond to climate change impacts, help prioritize adaptation actions in Yukon, and assess how climate change will impact people and communities in different ways.

4.0 Adaptation

4.1 Translating Scientific Information and Traditional Knowledge Into Action

Building Regional Adaptation Capacity and Expertise	• Northwest Territories is working to increase regional capacity and expertise in climate change. Funding for 15 new climate change-related positions across various Government of Northwest Territories departments was announced in October 2020 to support capacity and expertise to improve knowledge of climate change impacts and to work towards building resilience and adapting to climate change. Areas of focus for these positions include permafrost science, climate monitoring, climate science, and adaptation (including geohazards, wildlife, hydrology, forestry, archaeology, human health and well-being, and municipal and community affairs). • Nunavut continued to develop its Youth Advisory Committee on Climate Change, with plans under way for recruitment and committee meetings.

4.2 Building Climate Resilience Through Infrastructure

Investing in Infrastructure to Build Climate Resilience	• Through the Canadian Council of Ministers of the Environment, work progressed on a framework to facilitate a common understanding of key natural infrastructure terms and concepts. • Federal, provincial, and territorial governments announced funding for eight large-scale infrastructure projects under the Disaster Mitigation and Adaptation Fund (DMAF), with six in Ontario, one in Alberta, and one in British Columbia. The largest of these projects, valued at over $97 million, will contribute to flood mitigation in historic downtown Brampton, Ontario. • British Columbia invested $20 million to support upgrades to provincial highways and roads as part of StrongerBC economic recovery. • Alberta and Canada announced a number of water infrastructure projects under Investing in Canada Infrastructure Plan, expected to be initiated in 2021, making them more resilient to the impacts of climate change. • Saskatchewan is providing up to $16.5 million over five years to support the rehabilitation of irrigation infrastructure within four irrigation districts. • Manitoba supported nine on-farm water source development projects and seven sub-surface drainage water management projects. • Ontario released "Connecting the Southwest: A Draft Transportation Plan for Southwestern Ontario", committing the province to adopt climate change mitigation and impacts of a changing climate into the decision-making processes so that Ontario's highways and infrastructure are resilient to flooding and other damage caused by extreme weather. • Québec launched the third and final call for projects under the Municipal support program to establish infrastructure for sustainable management of rainwater at the source.

4.2 Building Climate Resilience Through Infrastructure

Investing in Infrastructure to Build Climate Resilience	• Nova Scotia has added criteria related to exposure and climate risk to its regional maintenance prioritization planning. • The New Brunswick Climate Change Secretariat provided guidance to infrastructure owners that allows them to build adapted infrastructure that reduces future upgrading or rebuilding costs prior to the infrastructure's end of life. • Newfoundland and Labrador developed a "Climate Lens" to ensure the full and effective integration of climate change considerations into the planning, design, and development of infrastructure projects. • Yukon investigated permafrost near the Dempster Highway, a key northern transportation corridor that connects Yukon and the Northwest Territories, to inform management of this highway in a changing climate. The Northwest Territories continued work on improvements to the runway at the Inuvik Airport and tank farms to improve fuel storage capacity in three coastal communities (Paulatuk, Ulukhaktok, and Sachs Harbour), and on the Mackenzie River. • Nunavut worked with Canada to host introductory climate data training for Government infrastructure staff and were in the initial stages of developing Nunavut-specific guidelines on a climate resiliency assessment.
Developing Climate-Resilient Codes and Standards	• Canada published national climatic design data incorporating the impacts of climate change for use by Codes and Standards in the design of buildings and infrastructure. The forward-looking data covers over 660 locations, and is currently under consideration for inclusion in the 2025 National Building Code and 2025 Canadian Highway Bridge Design Code. Federal, provincial, and territorial governments continued to work together to modernize and harmonize building codes and standards. • Québec developed a tool to assess the climate risks associated with its government buildings and their occupants. • New Brunswick introduced the *Building Code Administration Act* on March 17, 2020. • Newfoundland and Labrador implemented a project for municipal infrastructure projects to better incorporate climate change considerations into infrastructure planning and design. • Yukon had been working with stakeholders to develop guidance material for designing critical mine infrastructure for long-term climate change risk. The guidance material will focus on long-term mine infrastructure that could be affected by future changes in climate.

4.0 Adaptation	
4.2 Building Climate Resilience Through Infrastructure	
Developing Climate-Resilient Codes and Standards	• Northwest Territories made revisions and updates to the Good Building Practices for Northern Facilities manual, expected to be completed in 2021, to incorporate recent developments in building technology and construction practices, climate change considerations, lessons learned, and energy-efficiency items. • Nunavut provided input into the development of standards through the Northern Infrastructure Standardization Initiative and promoted the already existing standards.
4.3 Protecting and Improving Human Health and Well-Being	
Addressing Climate Change-Related Health Risks	• Canada's Infectious Disease and Climate Change Program supported the development of tools, information and guidance to support adaptation efforts, informing public health decision-making across Canada. This included the development of risk communications, education and awareness-building resources (videos, infographics); developing and sharing of risk maps and annual surveillance reports; and disease forecasting tools and knowledge synthesis on ways to prevent and control identified infectious disease risks, with a focus on Lyme disease, West Nile virus as well as some additional tick and mosquito-borne diseases and other infectious disease risks. • Canada's Infectious Disease and Climate Change Fund invested in 10 projects totaling $2.7 million to advance surveillance and monitoring capacity, and to build tools and resources to equip health professionals, communities, and Canadians to protect themselves from climate-driven infectious diseases. • Canada, in collaboration with the Committee for the Education of Health Professionals on Zoonoses and Climate Change, continued prioritizing emerging and re-emerging zoonotic diseases through multi-criteria decision analysis. This work is being undertaken with a 'one health' lens and incorporates climate-related impacts. Once priority diseases are identified, educational resources for health professionals will be developed. • Canada's HealthADAPT capacity building program, introduced in 2018 to help the Canadian health sector prepare for and respond to the health impacts of climate change, funded 10 projects in five provinces and territories until March 2022. • Canada helped health regions work towards new and enhanced Heat Alert and Response Systems, including providing technical support for the development of a *Heat Alert & Response Planning for Interior BC Communities: A Toolkit*.

4.3 Protecting and Improving Human Health and Well-Being

Addressing Climate Change-Related Health Risks

- In summer 2020, Canada updated heat-health outreach products for Canadians—targeting specific vulnerable populations—to reflect best practices in the COVID-19 context. Canada also convened two meetings of regional public health representatives and international heat-health experts to discuss the compounding issues related to extreme heat and COVID-19.
- British Columbia evaluated climate change-related health impacts as part of the Preliminary Strategic Provincial Climate Risk Assessment. All health authorities in the province have collaborated to develop Climate Resilience Design Guidelines for BC Health Facility Planning and Design.
- Two regional public health authorities in British Columbia, working with researchers from the University of British Columbia and with funding from Health Canada, created a series of maps that spatially represent community vulnerability to four important climate change hazards.
- Saskatchewan's Climate Resilience Measurement Framework annually examines the resilience of Saskatchewan residents to climate impacts. Four measures are used as indicators of human wellbeing and resilience. The 2020 Climate Resilience Report demonstrated that all four human well-being measures were meeting the Framework's targets.
- In August 2020, Ontario began work on a multi-sector climate change impact assessment that will evaluate how climate change is expected to impact the province by region and key areas including business and the economy, people and communities, natural environment, food and agriculture and infrastructure.
- The Québec government funded 10 greening projects with major impacts in several Québec municipalities and Montreal boroughs, totalling $9.1 million in the fight against urban heat islands and archipelagos.
- Nova Scotia's provincial risk assessment is using a wellbeing framework through which to assess climate impacts. Under the federal Building Regional Adaptation Capacity and Expertise program, Nova Scotia completed two workshops on climate risks within the Health and Continuing Care systems with stakeholders throughout the system.
- Prince Edward Island launched a province-wide climate change risk assessment. The risk assessment will improve understanding of the potential impacts of a changing climate, with a focus on sectors which have not previously been well-understood.

4.0 Adaptation

4.3 Protecting and Improving Human Health and Well-Being

Addressing Climate Change-Related Health Risks	• Newfoundland and Labrador implemented a successful project to determine the environmental burden of Lyme disease, with plans to expand the project in 2021. The province also continued to work with Canada to introduce new heat advisory criteria. • Funded through Canada's Climate Change Preparedness in the North Program, the Office of Yukon's Chief Medical Officer of Health in 2020 published "Health effects of extreme weather events and wildland fires: a Yukon perspective," which highlights the personal health impacts of climate change and makes recommendations for addressing impacts and monitoring population health effects. • The Northwest Territories committed to completing a health vulnerability assessment study to identify and understand the short-, medium- and long-term risks of climate change to human health and well-being in the territory, to identify key areas of vulnerability and to recommend potential adaptation activities. • Nunavut coordinated a multidisciplinary team to develop the Niqivut Silalu Asijjipalliajuq ("Our Food and Climate Change") research program. The project focuses on community-based research to document practices related to country food preparation and preservation in a changing climate, with the goal of supporting food safety, food security and food sovereignty for Nunavut communities.
Supporting Healthy Indigenous Communities	• Through the Climate Change and Health Adaptation Program (CCHAP), Canada provided $5.5 million in funding in fiscal year 2020-21 for 50 projects across 63 First Nations and Inuit communities in Canada to identify, assess and respond to a range of health impacts resulting from climate change. Through CCHAP, Canada provided funds directly to authorities in three regions for climate change and health adaptation research and projects, including $1.1 million of the $5.5 million total for BC's First Nations Health Authority. • Canada continued work with the Métis National Council and Governing Members to deliver on dedicated Métis Nation funding to advance action on climate change and health. Five projects received funding approval, and contribution agreements were established with Métis National Council, Métis Nation of Saskatchewan, Métis Nation of Alberta, Manitoba Métis Federation and Métis Nation of Ontario. These projects will explore how climate change impacts health and well-being, identify best practices to adapt, and explore future programming and resource gaps.

4.0 Adaptation

4.3 Protecting and Improving Human Health and Well-Being

Supporting Healthy Indigenous Communities

- Under the Forest Change Program, Canada worked with Indigenous communities to enable Indigenous-led climate change monitoring systems and adaptation action.
- The BC First Nations Health Authority continued to promote its Indigenous Climate Health Action Program, with funding from CCHAP.
- In October 2020, Alberta and Canada announced $107.5 million to support community infrastructure projects, including for the Siksika Nation, which will build two new drinking water wells. This project will relocate water wells out of the flood hazard area to secure the Nation's drinking water from the impacts of floodwater.
- Saskatchewan's Water Security Agency (WSA) continues to provide technical advice and grant funding for flood reduction measures through the Flood Damage Reduction Program (FDRP), a proactive, long-term flood mitigation program available to all communities, including First Nations and Métis Nation.
- Ontario launched a multi-sector climate change impact assessment in 2020. People and communities is one of the key areas of focus and includes consideration of climate change impacts facing Indigenous communities, remote and northern communities.
- Québec supported a research project aimed at assessing the food security of Nunavik communities based on the impact of climate change on terrestrial and aquatic fauna.
- Prince Edward Island launched a province-wide climate change risk assessment. First Nations communities have been invited to participate and have provided information on risks to their communities.
- With the support of Canada's Climate Change Preparedness in the North (CCPN) program, Yukon continued to deliver two projects in partnership with First Nations to understand how communities are adapting to the impacts of climate change on traditional diets and the impact of glacial changes on salmon.
- Yukon continued to participate on the regional funding committee for the Climate Change and Health Adaptation Program, which funds projects in Indigenous communities that support climate change adaptation projects related to health.
- The Northwest Territories continued implementation of the Sustainable Livelihoods Action Plan, which recognizes residents' connection to the land, upon which they depend for many things. The territory worked with Indigenous organizations to support food security.

4.0 Adaptation

4.3 Protecting and Improving Human Health and Well-Being

Supporting Healthy Indigenous Communities	• In 2020, the Northwest Territories initiated a two-year project to develop a Climate Change Adaptation Strategy for Wildlife in the NWT. • The Northwest Territories continued to communicate alerts and develop advisories related to extreme weather, natural disasters impacting health, zoonotic diseases and poor air quality for affected communities across the territory. • Nunavut participated in the Nunavut Committee on Climate Change Adaptation, established to support the proposal review process for the Climate Change Preparedness in the North, Indigenous Community-based Climate Monitoring, and Climate Change Health Adaptation programs. The committee reviewed and approved community-based adaptation projects.

4.4 Supporting Particularly Vulnerable Regions

Investing In Resilient Infrastructure to Protect Vulnerable Regions	• Canada continued to fund projects under the Investing in Canada Infrastructure Program and the Disaster Mitigation and Adaptation Fund (DMAF). In 2020, Canada announced $76 million in funding to small and/or vulnerable regions that are increasingly faced with the impacts of climate change. One such example is the Whitehorse South West Fire Risk Reduction, which will create a Fire Guard to protect Whitehorse from forest fires. • In March 2020, British Columbia awarded $13.8 million to four projects in remote Indigenous communities. • In 2019, Alberta provided a one-time grant of $3.3 million towards the building of a solar farm in the northern Alberta Indigenous community of Fort Chipewyan. In fall 2020, the project finished ahead of schedule and under budget, and was able to increase generation by an additional 150kW through the construction of an extra row of panels. • Québec continued a project on adapting the design and development of integrated management tools for road and airport infrastructure in permafrost regions. • Prince Edward Island established a new monitoring program to assess the impacts of coastal infrastructure on the beach systems and adjacent coastlines. • Yukon invested $3.35 million in a program to provide non-repayable grants for cost-effective energy efficiency upgrades in electrically and oil heated homes.

4.4 Supporting Particularly Vulnerable Regions

Investing In Resilient Infrastructure to Protect Vulnerable Regions	• Yukon evaluated the vulnerability of government buildings in permafrost regions and developed building-specific action plans to mitigate and adapt to permafrost thaw, with support from the federal government's Climate Change Preparedness in the North program. • Northwest Territories developed a desktop surficial geology and terrain sensitivity map for one community as a pilot study to investigate options for acquiring community scale surficial geology and terrain sensitivity to support community hazard mapping and community planning decisions linked to climate change adaptation. • Nunavut continued to identify permafrost concerns and implement adaptation measures in territorial parks. Work in 2020 included training for local parks staff on permafrost monitoring and community engagement with municipal staff, elected officials, elders, and youth.
Building Climate Resilience in the North	• Canada continued its Climate Change Preparedness in the North Program, which funded 133 projects in 2019-20. • The Saskatchewan Public Safety Agency consulted on wildfire mitigation projects in northern Saskatchewan and continued to work with First Nations and Métis Nation communities to deliver FireSmart programming on wildfire fuel management. • In December 2020, Ontario released a draft of its transportation plan for northern Ontario, "Connecting the North". • Québec completed the evaluation of the impact of climate change on the maritime and coastal environment of Nunavik. • Québec improved permafrost mapping and assessed its sensitivity to thaw in order to plan sustainable development in each of the 13 northern villages built on permafrost. • Yukon completed a project to establish long-term monitoring plots to track climate-induced changes to forest composition. • Yukon initiated a Yukon-wide climate risk assessment in 2020 as well as efforts to establish a system to measure climate resilience. • Yukon, Northwest Territories, and Nunavut committed to continue to work together for another five years through the Pan-Territorial Adaptation Partnership.

4.0 Adaptation

4.4 Supporting Particularly Vulnerable Regions

Supporting Community-Based Monitoring by Indigenous Peoples	• Canada funded 63 projects through the Indigenous Community-Based Climate Monitoring Program in 2019-2020. • Canada's Climate Change Preparedness in the North (CCPN) program continued to provide support to northern communities and organizations to help them adapt to climate change impacts. • Alberta continued support for the Indigenous Climate Change Observation Network, with a focus on the Fire with Fire project, a two-year collaborative relationship between Alberta, the Resilience Institute, and Indigenous communities in Alberta to explore the historical and contemporary relationships between Indigenous communities and changing fire regimes on their traditional territories. • New Brunswick continued its work to support the development and monitoring of culturally appropriate indicators for climate change in Neqotkuk (Tobique First Nation). • Yukon worked with First Nations staff to undertake research activities, increase local capacity for monitoring, and study the impacts of climate change on winter ticks, which parasitize ungulates including moose, elk, and deer, launched an incentive program to increase engagement with the hunting community, including Yukon First Nation hunters, with support from the federal CCPN. • The Government of Northwest Territories initiated the Northwest Territories Climate Change Council as a forum for the sharing of information, collaboration, and engagement between Indigenous governments and organizations, communities, and the GNWT. The Council was initiated in August 2020. • Nunavut continued to support SmartICE activities in Arctic Bay. In 2020, three main activities took place: 1) regular surveys to measure sea-ice thickness on community routes; 2) hosting of a workshop with tourism operators; and, 3) hosting of workshops to document Inuit sea-ice terminology.
Supporting Adaptation in Coastal Regions	• Canada continued working to ensure Canadians, including those in coastal regions, have access to the Aquatic Climate Change Adaptation Services Program (ACCASP) information, tools, and research findings.

4.4 Supporting Particularly Vulnerable Regions

Supporting Adaptation in Coastal Regions	• Canada continued to conduct ocean science, research and monitoring to inform adaptation decisions related to fisheries and oceans management and in support of coastal communities and infrastructure. Under the ACCASP, Canada funded ocean monitoring in all three of Canada's oceans, 6 joint projects under the ongoing DFO-NOAA Ocean Acidification Collaboration, and 15 research projects to better understand and forecast changing ocean conditions and impacts on ecosystems, fisheries, and coastal infrastructure. • British Columbia continued mapping the risk of saltwater intrusion in coastal regions and aquifers in northern areas. • British Columbia worked on a renewed provincial Flood Strategy and continued to support the development of the regional Lower Mainland Flood Management Strategy. • Québec continued efforts to complete various mapping projects, model coastal ecosystems and assess the vulnerability of communities to erosion, in close collaboration with key players in the municipal sector and regional organizations. • Nova Scotia continued work to develop regulations for the *Coastal Protection Act*. This included work on developing minimum building elevations and a standardized tool for determining site-specific horizontal setbacks based on local erosion risk. • New Brunswick produced an updated "Sea-Level Rise and Flooding Estimates for New Brunswick Coastal Sections 2020" report. This report provides the most recent projections of worst-case scenario coastal flooding elevations to best inform coastal communities on the impending risks. • New Brunswick was selected by Canada as the Atlantic Case Study for its Coastal Flood Mitigation Canada project. A full-scale coastal flood risk assessment is being undertaken by Canada and the National Research Council, with support from New Brunswick coastal specialists, scientists, and researchers. This work will be conducted in 7 municipalities and surrounding areas of New Brunswick's Acadian Peninsula. • Prince Edward Island developed new coastal hazard information, with support from Canada's National Disaster Mitigation Program. The new data is being used to provide advice on private development and public infrastructure design and to produce a new Coastal Property Guide. • In September 2020, Newfoundland and Labrador released a new handbook, videos, and data that supports municipalities, planners, and other professionals to access up-to-date information on the implications of sea level rise, including case studies of coastal change across the province.

4.0 Adaptation

4.4 Supporting Particularly Vulnerable Regions

Supporting Adaptation in Coastal Regions	• The Northwest Territories is working in partnership with the Hamlet of Tuktoyaktuk and has relocated houses threatened by coastal erosion, with funding support from Canada. • In November 2020, Nunavut received over $24 million from the federal Oceans Protection Plan to improve and increase climate resilience to sealift areas in the following nine communities: Arviat, Baker Lake, Cambridge Bay, Chesterfield Inlet, Kinngait, Kuugaruk, Qikiqtarjuaq, Rankin Inlet, and Taloyoak.

4.5 Reducing Climate-Related Hazards and Disaster Risks

Investing in Infrastructure to Reduce Disaster Risks	• Canada worked with provinces and territories through the Canadian Council of Ministers of the Environment to develop guidance for conducting climate change risk assessments across jurisdictions. • British Columbia continued development of a climate preparedness and adaptation strategy to reduce climate related hazards and disaster risks. • In July 2020, Saskatchewan submitted two applications to the Disaster Mitigation and Adaptation Fund, for the Rafferty and Lafleche dams. • Manitoba invested in the network of water control and flood mitigation infrastructure to enhance flood protection in communities, considering the increase in severity of weather events. • Ontario reviewed the outcomes of a climate resilience pilot project released in June 2019 under the Municipal Disaster Recovery Assistance program that is intended to encourage municipalities to rebuild infrastructure damaged in a natural disaster to better withstand future extreme weather events. A total of 26 municipalities were approved for MDRA funding in March 2020 for response and recovery costs arising from 2019 spring flooding. • Nova Scotia developed and revised standards for agricultural dyke construction and maintenance based on updated and projected sea level rise scenarios. They moved into the post-restoration monitoring phase for the Truro-Onslow salt marsh restoration project. • New Brunswick invested in dyke design improvements and regular maintenance to ensure protection from storm events and sea level rise, specifically targeting protection of the transportation and utilities link between New Brunswick and Nova Scotia.

4.0 Adaptation

4.5 Reducing Climate-Related Hazards and Disaster Risks

Investing in Infrastructure to Reduce Disaster Risks	• Yukon continued to reduce risk to infrastructure from forest fires through the FireSmart program. Wildfire protection plans will be completed for all Yukon communities by 2026, with Watson Lake, Teslin, Haines Junction, Carmacks, Mayo, Dawson City and Old Crow all underway in 2020. • Nunavut assessed risks of permafrost thaw to airport infrastructure and focused efforts on understanding damage caused to the Rankin Inlet runway and suggesting adaptive solutions.
Advancing Efforts to Protect Against Floods	• Canada announced the extension of the National Disaster Mitigation Program over two years, which aims to reduce the impacts of flood disasters by: focusing investments on significant, recurring flood risks and costs; and advancing work to expand the private residential insurance market for overland flooding. • The Federal Flood Mapping Committee met monthly to coordinate data acquisition, guidelines and best practices to meet the national requirements for floodplain mapping and monitoring. • Canada continued work towards options to standardize flood mapping guidelines in Canada, and also continued work towards consistently mapping and designating flood hazard zones across all of Canada, including incorporating climate change projections, in partnership with provinces, territories, and Indigenous Peoples. • Canada continued advancing work with provinces, territories, and industry to establish a Task Force to develop options for a national high-risk flood insurance program and national action plan on relocation, while also planning to work with the private sector and homeowners to incentivize investments in flood defenses and flood mitigation. • Canada continued working to evaluate and modernize federal disaster assistance programming through a review of the Disaster Financial Assistance Arrangements Program. • In addition to these flood initiatives, Canada and the provinces and territories continued developing a joint Action Plan for the Emergency Management Strategy for Canada. Collaborative work between FPT partners began in 2019 and was briefly put on hold in 2020 during the pandemic. Drafting of a co-developed Emergency Management Strategy Action Plan for 2020-21 began in late 2020 with an aim to publish in 2021.

4.5 Reducing Climate-Related Hazards and Disaster Risks

Advancing Efforts to Protect Against Floods	• British Columbia released a Flood Preparedness Guide in spring 2020. Progress was made towards a renewed BC Flood Resilience Strategy with Fraser Basin Council conducting a series of investigations alongside engagement with local governments, Indigenous communities, the public, and other partner groups. The province continues to work on LiDAR mapping for Vancouver Island, Lower Mainland, Okanagan and Kootenays to be used in flood modelling and mapping. • In February 2020, British Columbia established a government-to-government partnership with the Cowichan Tribes to ensure long-term water sustainability for the Koksilah watershed and developed a water sustainability plan for the area. • British Columbia worked with the First Nations Fisheries Council to develop a framework for Indigenous engagement on water policy. • Alberta's Technology Innovation and Emissions Reduction Fund will provide $45 million in 2020 to ten high-priority flood mitigation projects through the Alberta Community Resilience Program, including flood protection for Edmonton's two water treatment plants, and debris and flood protection on steep creeks in the Town of Canmore and the Municipal District of Bighorn. • Saskatchewan's Water Security Agency continued to measure stream flows, provide flow forecasts, conduct flood risk mapping, flood protection related planning, engineering and project construction, and other program delivery, including the Flood Damage Reduction Program and the Emergency Flood Damage Reduction Program. • Ontario released its provincial Flooding Strategy in March 2020. Ontario's Flooding Strategy outlines over 90 actions on the province's next steps to strengthen Ontario's resiliency to flooding and help Ontarians be better prepared for flood events. • In 2020, Ontario established a multi-partner flood mapping technical team, to ensure a collaborative and strategic flood mapping program. This team, consisting of staff from provincial and federal government agencies, municipalities, conservation authorities and academia, will coordinate activities to enhance flood mapping as well as provide input into the review and update of current flood mapping technical guides. • In April 2020, Québec published a flood protection plan for the province. The plan identifies 23 measures to ensure the safety of people and the protection of property in flood-prone areas.

4.0 Adaptation

4.5 Reducing Climate-Related Hazards and Disaster Risks

Advancing Efforts to Protect Against Floods	• In August 2020, New Brunswick released the 2018 flood extent mapping for the lower St. John River that identified the extent of the worst spring flooding ever in the lower St. John River. • In 2020, Newfoundland and Labrador operated the Hurricane Season Flood Alert System to provide advanced notice of precipitation and flooding. • A report reviewing existing flood maps for nine communities in the Northwest Territories was developed and completed. The Hamlet of Tuktoyaktuk also utilized funding from the Investing in Canada Plan to improve a critical community road that is vulnerable to flooding. • Nunavut is collaborating with Canada to produce community drainage plans. In 2020, a Master Drainage Plan for Grise Fiord was started.
Supporting Adaptation in Indigenous Communities	• In 2019-20, Canada continued to implement the First Nation Adapt Program, funding 69 projects that support communities to assess their climate change risks to infrastructure and emergency management and identify adaptation measures to develop resilience. • British Columbia continued to collaborate on the development of the strategy and work to advance partnerships between the Province and Indigenous Peoples on preparing for and adapting to climate change. British Columbia is also working with the First Peoples Cultural Council to develop an Indigenous Cultural Heritage and Climate Change program to better understand climate impacts to cultural heritage; develop a risk assessment model; and, integrate Indigenous and western sciences and knowledge to develop adaptive strategies for climate change. • In October 2020, it was announced that the Municipal Climate Change Action Centre received $4.5 million to administer a new Climate Adaptation Program to help municipalities and Indigenous communities in Alberta better understand, manage and adjust to a changing climate • In 2020, the Saskatchewan Public Safety Agency continued services through a position dedicated to manage and coordinate Indigenous engagement and initiatives that create increased opportunity to offer the same guidance on emergency planning specifically to First Nation communities in Saskatchewan. • Manitoba is also committed to addressing long standing flood-related issues on reserve lands through ongoing trilateral negotiations for a Comprehensive Settlement Agreements with each First Nation (Dauphin River, Lake St. Martin, Little Saskatchewan and Pinaymootang) on Lake St. Martin.

4.5 Reducing Climate-Related Hazards and Disaster Risks

Supporting Adaptation in Indigenous Communities

- Ontario is working on an Ontario Hydrogen Strategy that increases and decarbonizes the production of hydrogen. This will help to build distribution infrastructure and create more opportunities for end users across the economy.
- Consultations with Indigenous Peoples were an essential component of Québec's 2030 PGE. Québec published two reports summarizing this consultation, the "Summary of Indigenous Consultations" report and the "Cree Nation Consultation on the Development of the Electrification and Climate Change Plan" report. These consultations helped guide the investments in the *2021–2026 Implementation Plan* to support Indigenous community leadership in the climate transition.
- Nova Scotia continued working on the development of its new Climate Plan. On October 30, 2020, the *Plastics Bag Reduction Act* came into effect in Nova Scotia. Businesses are no longer able to provide single use plastic bags at the checkout to encourage waste reduction at the source and to help keep plastic out of the environment and landfills.
- New Brunswick provided funding for Climate Change Vulnerability Assessments and Adaptation Plans completed for St. Mary's First Nation, and community Vulnerability Assessments completed by Eel River Bar First Nation and Tobique First Nation.
- Through partnership with educational institutions and partners within the Nunatsiavut communities, Newfoundland and Labrador conducted research related to climate change impacts, such as changes in sea ice.
- The Government of the Northwest Territories (GNWT) initiated the Northwest Territories Climate Change Council in 2020, to provide guidance and advice to inform and advance GNWT climate change and environment programs in alignment with Indigenous governments and organizations and community perspectives, interests, and knowledge.
- Nunavut started the compilation of climate data at the territorial, regional, and community level to use for future risk assessments of various scales.

5.0 Clean Technology, Innovation, and Jobs

5.1 Building Early-Stage Innovation

Supporting Early-Stage Technology Development

- Canada provided approximately $683 million and $787 million in clean energy research and development funding in 2019-20 and 2020-21, respectively.
- In October 2020, Canada provided a $100 million investment to the Clean Resource Innovation Network, a consortium of industry, academia, and governments, among others, to support research and development projects that advance the environmental and economic performance of the oil and gas sector. British Columbia's Innovative Clean Energy Fund and Sustainable Development Technology Canada worked together to support the development of pre-commercial clean energy projects and technologies in 2020.
- In July 2020, the Canadian Emission Reduction Innovation Network (CERIN) announced projects selected for funding from their 2019 call for proposals. CERIN is jointly supported by Alberta and Canada with funding of up to $15.15 million to support clean technology development to reduce methane and short-lived climate pollutants from the oil and gas sector.
- British Columbia provided tax breaks to support investment in clean technology companies, supported training and mentorship programs for clean tech startups and appointed a provincial Innovation Commissioner.
- British Columbia continued its $100 million BC Tech Fund, and committed to launch a $500 million strategic investment fund to build a more innovative low carbon economy.
- Alberta's Oil Sands Innovation Fund recycled compliance revenue to support innovative emissions reduction projects.
- Alberta dedicated more than $250 million to Emission Reduction Alberta's challenges to boost industrial efficiency, sustainable transportation, natural gas uptake, carbon capture and storage, and low-carbon agriculture, with support from Canada's Low Carbon Economy Leadership Fund.
- Manitoba's Innovation Growth program announced funding for three industry-led clean technology projects for a total of $219,000. The investment will help the companies to develop and commercialize new, innovative products and services.
- Québec provided its Research and Innovation Strategy – Oser Innover (Dare to Innovate) – and the Technoclimat program with an additional $58.5 million over five years as part of the *2030 Plan for a Green Economy*.
- Québec supported the Center for Excellence in Energy Efficiency (C3E) for pre-commercial technologies and the Ecofuel Accelerator to support the emergence of start-up and seed companies in the clean technology sector.

5.0 Clean Technology, Innovation, and Jobs

5.1 Building Early-Stage Innovation

Supporting Early-Stage Technology Development	• Nova Scotia partnered with Innovacorp, its early-stage venture capital organization, to support clean tech companies and continued its GreenShoots program to support early stage companies focused on innovation in agriculture, food, bioproducts, clean technology and related sectors. • Nova Scotia continued its Industry Driven Research and Innovation Program and its Early Stage Commercialization Fund. • New Brunswick in partnership with Moltex Energy and ARC Clean Energy Canada, worked to develop a research cluster in the province to advance the development of small modular reactors. • Newfoundland and Labrador implemented its Technology Sector Work Plan, investing $1.6 million into research, development, and innovation funding and $4 million to support commercial projects. • Newfoundland and Labrador partnered with large industry and small businesses to support business development projects, research and development projects and innovation and business funds.
Mission-Oriented Research and Development	• Canada continued working with 24 countries and the European Union through the global Mission Innovation (MI) initiative, to accelerate clean energy innovation, participating in all eight of MI's Innovation Challenges (ICs) and co-leading the Sustainable Biofuels and Clean Energy Materials ICs. • Canada continued its Energy Innovation Program, Program of Energy Research and Development, Clean Growth Program, and Impact Canada Initiative to boost clean technology research and economic growth. • Canada continued to provide funding for programs in the areas of green infrastructure, clean energy, industry, energy efficiency, energy efficient buildings and homes, and sustainable transportation. • Newfoundland and Labrador and Canada funded the construction of a research and development facility for harsh environment research. • British Columbia invested over $20 million, from 2017-18 to 2019-20, in research infrastructure through the Knowledge Development Fund to support innovative clean technology research. • Saskatchewan's SaskEnergy supported the Canadian Gas Association's Natural Gas Innovation Fund, which provides grants to fund early-stage startups developing solutions that drive innovation and help achieve environmental objectives. Manitoba's Research Manitoba New Investigator Operating Grants supported research on four projects in 2020.

5.0 Clean Technology, Innovation, and Jobs

5.1 Building Early-Stage Innovation

Mission-Oriented Research and Development	• Québec funded an Industrial Research Chair at the Université de Sherbrooke, for the launch of the strategic Intelligent Energy Network, and provided tax credits for technology research and development. • Nova Scotia supported the Offshore Energy Research Association in coordinating research projects on tidal energy, hydrogen and geothermal energy, electricity grid issues, and economic modelling for renewable energy projects. • Nova Scotia supported clean technology initiatives in the bio-economy and agriculture sectors, and expanded Forest Resource Analysis to include forest carbon accounting and climate change impacts. • Prince Edward Island launched the Climate Challenge Fund, a $3 million commitment being delivered over the next three years, to support innovative solutions to climate change. The Fund will provide up to $100,000 to support projects that reduce GHG emissions, help communities and the economy adapt to a changing climate, and address inequities and discrimination that are generated or augmented by the negative impacts of climate change. The first call for proposals was released in November 2020. • Newfoundland and Labrador supported research and development through such initiatives as the Business Innovation Agenda, Technology Sector Work Plan, Cabinet Committee on Jobs, and Regional Innovation Systems.

5.2 Accelerating Commercialization and Growth

Access to Government Programs	• The Canada Infrastructure Bank's Growth Plan included a $500 million investment in 2020 for Project Acceleration. The program will invest in due diligence and early construction works in order to accelerate high impact infrastructure projects expected to make a long-term investment. • Canada's Clean Growth Hub adapted its operations to gather information on the evolving needs of clean technology companies as they navigated the COVID-19 pandemic, and promoted COVID-19 support measures in real time as it continued to help clean technology producers and adopters navigate the federal ecosystem of clean technology programs and services. • As part of their existing MOUs with Canada's Clean Growth Hub, British Columbia and Alberta increased federal-provincial collaboration to support clean technology activities and ensure that companies remained aware of programs available to them. Nova Scotia signed a similar MOU with Canada's Clean Growth Hub in 2020.

5.0 Clean Technology, Innovation, and Jobs

5.2 Accelerating Commercialization and Growth

Access to Government Programs	• Alberta's Clean Innovation Office coordinated the implementation of programs under the Climate Change Innovation and Technology Framework and promoted government programs. • Yukon continued work to modernize its existing economic development funding programs.
Incresing Support to Advance and Commercialize Innovative Technologies	• Canada continued a bioplastics and wood biomass challenge, and supported research and development of biomass and bioproduct solutions for a cleaner economy. • Canada continued to provide support and solutions for Canadian businesses through the Agricultural Clean Technology program, the Business Development Bank of Canada's Cleantech Practice, and Sustainable Development Technology Canada's (SDTC) SD Tech Fund. • In December 2020, Canada's strengthened climate plan included $750 million for the recapitalization of SDTC to support its core activities of funding demonstration and commercialization activities by clean technology firms. • British Columbia and Canada funded the BC Cleantech Cluster Initiative, which brought together stakeholder groups to help advance BC's cleantech industry. The Foresight Cleantech Accelerator Centre prepared a public report based on these sessions. • Newfoundland and Labrador collaborated with the Atlantic Canada Opportunities Agency and the Newfoundland and Labrador Environmental Industry Association to develop a Clean Technology Growth Strategy. • British Columbia's CleanBC supported businesses through its Innovation Fund and its Go Electric Advanced Research and Commercialization program, and the province continued its Ignite Program and Fast Pilot Program. • Alberta launched the Technology and Innovation Emissions Reduction Economic Recovery Program in November 2020. Emissions Reduction Alberta announced funding for projects to improve cost competitiveness, reduce GHG emissions, and improve industrial efficiency in Alberta's energy sector. • Saskatchewan's SaskEnergy supported technology demonstration projects for thermal energy and heat pumps, including funding right-sized high efficient natural gas furnaces and smart thermostats in Saskatchewan's first net-zero multi-unit residential building. • Québec's Innovation Project supported businesses to carry out and market their innovation projects, and continued to provide a tax holiday for new businesses that help market clean technologies.

5.0 Clean Technology, Innovation, and Jobs

5.2 Accelerating Commercialization and Growth

Incresing Support to Advance and Commercialize Innovative Technologies	• Nova Scotia's Innovation Hub launched projects to support clean tech and bio-fuel product and market development, and continued programs to support businesses hire post-secondary experts, with tax credits and incubation facilities for companies in the clean tech sector. • Newfoundland and Labrador provided support for innovative entrepreneurs in the clean technology sector, funding for product promotion by clean tech companies, and funding for research and development projects led by tech companies in the province.
Strengthening Support for Skills Development and Business Leadership	• Canada provided $75 million for the Future Skills program, continuing a 2018 investment of $225 million over four years. The program aims to identify major economic trends, identify emerging skills in demand, test and evaluate approaches to skills development, and share its results and best practices across public, private and not-for-profit sectors. • Canada offered a suite of programs to support industry to engage students and recent graduates, and to provide meaningful work experiences for students to enhance future employability. Programs include, for example: Mitacs; the Business + Higher Education Roundtable; Digital Skills for Youth; and the Student Work Placement Program and other youth placement programming under the Youth Employment and Skills Strategy. These programs offer a targeted number of placements for students and youth and can be accessed by industry, including those in the Clean Tech sector. Canada also continued its Sectoral Initiatives Program. • In September 2020, Newfoundland and Labrador and Canada announced a total investment of more than $2.7 million for TechNL to offer the Business Tech Solutions Program for Newfoundland and Labrador companies. • British Columbia's Innovate BC Venture Acceleration Program provided coaching and mentoring services to help technology entrepreneurs accelerate the process of defining a proven business model, delivered by a province-wide network of regional technology accelerators and executive-level mentors. • Manitoba supported the North Forge Technology Exchange to coordinate innovation-based economic development initiatives, programs and services for entrepreneurs and businesses. • Manitoba provided funding for the Manitoba Environmental Industries Association to deliver a range of programs on job training, training for sustainable technology implementation, and to host a climate business summit.

5.0 Clean Technology, Innovation, and Jobs

5.2 Accelerating Commercialization and Growth

Strengthening Support for Skills Development and Business Leadership	• Québec continued its Internship Incentive Program and provided tax credits for expenditures for on-the-job training for interns and internship supervisors. • Nova Scotia offered programs to support hiring post-secondary students, skills training and student research, including specific programs targeting the energy sector. • Nova Scotia offered programs to support trades education and training, and continued its Clean Energy Revolution Pilot. • Yukon's innovation hub, Northlight Innovation, brought business and industry, Yukon University, the Yukon Development Corporation, and public programs together to create an environment to support entrepreneurs and promote the development and growth of innovative businesses in Yukon.
Expedite Immigration of High-Qualified Personnel	• Canada's Global Skills Strategy provided employers with a faster and more predictable process for attracting highly skilled foreign talent. Employers that use the Global Talent Stream to access highly-skilled foreign workers make commitments toward job creation, investment in skills and training, knowledge transfer, and co-op placements. • British Columbia continued its Provincial Nominee Program Tech Pilot to attract talent to support sector sustainability and growth. • Alberta's International Graduate Entrepreneur Immigration Stream allowed qualified international graduates from Alberta post-secondary institutions to apply for permanent residency status, provided they plan to establish or operate a business in Alberta. • The Manitoba Provincial Nominee Program allowed Manitoba to prioritize immigration applicants with in-demand skills and a strong connection to Manitoba for assessment within six months. • Québec offered a tax holiday for foreign researchers or experts in respect of the wages earned for up to five years of research activities in a business conducting scientific research or experimental development in Québec. • Nova Scotia's Atlantic Immigration Pilot offered faster processing times for employers to fill identified labour gaps with skilled foreign workers and international graduates. • Nova Scotia's Nominee Program targeted international workers with specific skill sets to address emerging labour market demands.

5.0 Clean Technology, Innovation, and Jobs

5.2 Accelerating Commercialization and Growth

Expedite Immigration of High-Qualified Personnel	• Newfoundland and Labrador also offered an Atlantic Immigration Pilot to speed up processing times for employers to fill identified labour gaps and a Nominee Program targeting international workers with specific skill sets to address labour market demands.
Promoting Exports of Clean Technology Goods and Services	• Canada's International Business Development Strategy for Clean Technology and the Trade Commissioners Service helped Canadian clean tech firms grow and scale globally and access global climate finance opportunities in developing countries. • Canada and British Columbia announced investments in the BC-based Alacrity Foundation's BC Cleantech Program. The program is designed to help British Columbia clean tech companies scale-up and generate new international export and investment attraction opportunities in target global markets, including Mexico, India, Singapore, and northern Europe. • Alberta launched Invest Alberta as an independent Crown Corporation charged with attracting foreign investment as well as fostering export opportunities abroad for Alberta's key sectors, including energy and clean technology. • Manitoba's World Trade Centre (WTC) Winnipeg worked to promote and develop an agenda for WTC Accra – "Africa and the Circular Economy: Opportunities, Benefits, and Trends." WTC Winnipeg supported two Manitoba clean tech companies to present at this forum. • Ontario continued clean tech focused trade missions and exhibitions, incoming buyers' missions, exporter education seminars and workshops for Ontario businesses looking to export outside Canada. • Québec's Export Program supported Québec businesses to prepare to export, strengthen existing export capabilities, and consolidate and diversify their markets outside Québec. • Nova Scotia's Innovation Hub co-hosted a virtual Atlantic BioCon, an Atlantic Canada Bio-Refining Conference, with New Brunswick's BioNB. • Nova Scotia Business Inc. supported businesses export growth and global competitiveness.
Standards-Setting	• The Standards Council of Canada advanced nine standardization proposals that will grow Canadian exports and create jobs, as well as five standardization proposals focused on intellectual property. • Manitoba's Office of the Fire Commissioner considered codes and standards that support the use of alternative fuels, and trained an electrical inspector to approve the equipment and installation of solar panels. • The Québec Standardization Office provided support to the business, industrial, social and regulatory communities. It serves as Québec's representative to the Standards Council of Canada.

5.0 Clean Technology, Innovation, and Jobs

5.3 Fostering Adoption

Leading By Example: Greening Government Operations	• Canada, through Innovative Solutions Canada, supported Canadian businesses to develop and test innovative solutions to challenges identified by federal departments. • Canada updated, in December 2020, its Greening Government Strategy, which encourages federal departments to adopt clean technology and undertake clean technology demonstration. • Canada committed carbon pollution proceeds programming funding through the Climate Action Incentive Fund to four provinces (New Brunswick, Manitoba, Saskatchewan, and Ontario). This funding included up to $60 million to projects in those provinces to help make schools more sustainable and climate resilient. • British Columbia reduced GHG emissions from its buildings and fleet by increasing funding for the Carbon Neutral Capital Program to $50 million per year to support emission reductions and energy conservation projects. • Nova Scotia awarded contracts to four companies to convert fossil fuel heating systems at six sites to new efficient wood chip heating systems, replacing imported fossil fuels with a locally sourced renewable resource. • Newfoundland and Labrador invested $14 million to continue to transition public buildings to clean electricity, through electrification retrofits, as well as energy efficiency improvements.
Supporting Indigenous Peoples and Northern and Remote Communities Adopt Clean Technologies	• Canada's Northern REACHE program supported 32 projects in Yukon, Northwest Territories, Nunavut, Nunavik, and Nunatsiavut in 2020. • British Columbia supported projects through the Community Energy Leadership Program, which aims to support First Nations and local government investments in energy efficiency and clean energy projects, including building retrofits, heat pumps, and biomass district energy. • Construction of the Fort Chipewyan solar farm in northern Alberta, Canada's largest Indigenous-owned solar farm, was completed in fall 2020. Alberta and Canada provided funding support of $7.8 million, for the solar farm, which will reduce diesel use by the Fort Chipewyan community by 25 per cent (800,000 liters) annually. • In Québec, the Société du Plan Nord and the Ministère de l'Énergie et des Ressources naturelles continued developing a draft collaboration agreement with Nunavik's economic stakeholders to support the community's energy transition.

5.0 Clean Technology, Innovation, and Jobs

5.3 Fostering Adoption

Supporting Indigenous Peoples and Northern and Remote Communities Adopt Clean Technologies	• New Brunswick provided the opportunity for renewable energy developers to engage with Indigenous Peoples to develop renewable energy generation projects. • Newfoundland and Labrador supported the Nunatsiavut Government's pursuit of renewable energy solutions for their five communities through the Nunatsiavut Energy Security Working Group. Newfoundland and Labrador also collaborated with them to develop an application to obtain federal funding to support the purchase and installation of 300 high-efficiency wood stoves in Nunatsiavut communities. • Newfoundland and Labrador worked with stakeholders, including Indigenous governments and organizations, to pursue renewable energy solutions for isolated diesel-generated electricity systems and overall in Indigenous and isolated communities. • In the Northwest Territories, the Shining Lights workshops series, created by the Centre for Indigenous and Environmental Resources to increase energy literacy in the Northwest Territories and promote energy-efficient practices, was completed. • Northwest Territories continued the deployment of biomass heating systems in Indigenous communities. • Yukon continued to support renewable energy projects and the adoption of smaller-scale renewable energy sources for homes and businesses through the Independent Power Production and Micro-generation policies and associated funding.
Consumer and Industry Adoption	• Canada, through the Fisheries and Aquaculture Clean Technology Adoption Program, provided $4.8 million to support 28 fisheries, aquaculture and seafood processing projects in adopting clean "market-ready" technologies into their day-to-day activities. • Canada continued work with provincial and territorial governments and industry stakeholders to encourage market transformation in three key equipment areas: windows, space heating and water heating. • Alberta announced up to $280 million in funding from the Technology Innovation and Emissions Reduction Fund and Canada's Low Carbon Economy Leadership Fund to fund three programs, the Shovel Ready Challenge, the Energy Savings for Business Program, and the Partnership Intake Program, to support approximately 5,000 jobs and reduce an estimated 13 million tonnes of GHG emissions by 2030.

5.0 Clean Technology, Innovation, and Jobs

5.3 Fostering Adoption

Consumer and Industry Adoption	• Québec funded and implemented programs related to clean technology investment in the forestry, commercial transportation, building, agriculture, and vehicle sectors, including the Ride Green Program, the Green Shipping Program, the Residual Forest Biomass Program, and the Heat Green - Businesses, Institutions and Industries Program. • Nova Scotia continued to fund and implement a number of programs and projects related to supporting clean technology adoption, including Efficiency Nova Scotia projects, the Agriculture Business Advancer Program, the Low Carbon Communities Grant Program, a pilot program to test the efficiencies of heat pump hot water heaters, and the SolarHomes Program. • Yukon supported a project to replace outdated transmission lines and build up the power grid, and also broadened rebates for electric vehicles and bicycles.

5.4 Strengthening Collaboration and Metrics for Success

Enhance Alignment Between Federal, Provincial, and Territorial Actions	• Canada launched the Small Modular Reactor (SMR) Action Plan, which builds on the momentum of Canada's SMR Roadmap published in 2018 and lays out the next steps to develop and deploy SMRs in Canada. New Brunswick, Alberta, Saskatchewan, Ontario, Yukon, and Prince Edward Island all made submissions to the Action Plan, and Nunavut's Qulliq Energy Corporation also participated in the development. • Alberta signed onto the interprovincial Small Modular Reactor Memorandum of Understanding, including work to develop a joint Feasibility Study on SMRs in August 2020. • The Government of Saskatchewan established a Small Modular Reactors (SMR) Unit within the Ministry of Environment to explore the development and deployment of SMRs for zero-emissions electrical generation. • In addition to existing MOUs with British Columbia and Alberta, Canada's Clean Growth Hub signed an information-sharing MOU with Nova Scotia. • Following on the 2019 agreement of the Atlantic Provinces and the federal government to work together to develop a Clean Power Roadmap for Atlantic Canada, Canada released the Clean Power Road Map Interim Report in August 2020. • Nova Scotia, British Columbia, Ontario, Québec, Manitoba, and New Brunswick worked to harmonize appliance standards with federal regulations through the Regulatory Reconciliation and Cooperation Table.

5.0 Clean Technology, Innovation, and Jobs

5.4 Strengthening Collaboration and Metrics for Success

Enhance Alignment Between Federal, Provincial, and Territorial Actions	• The Alberta-Canada Collaboratory on Clean Energy Research and Technology continued to foster communication between Alberta and Canada. • Nova Scotia continued work to harmonize the household standards captured under the Energy-efficient Appliances Regulations with Canada's regulations and other provinces and territories.
Establishing A Clean Technology Data Strategy	• The FPT Working Group on Clean Growth met to discuss the data produced through the Clean Technology Data Strategy, which produced provincial and regional level statistics to meet the provincial request for more targeted and regionally specific data. • Canada continued investing in the Clean Technology Data Strategy, including data releases on the clean technology sector and collection and dissemination of data for start-ups and very small firms not captured by the Survey of Environmental Goods and Services in partnership with regional clean tech associations. • Canada's Clean Growth Hub continued working with federal clean technology programs to better understand how federal investments in clean technology are contributing to clean growth and climate action. • Canada's Canadian Centre for Energy Information launched its website, to serve as a single point of access for energy related information and data from over 50 sources.

Cross Cutting	
Canada	• The Canada Infrastructure Bank announced that it will deliver a $10 billion Growth Plan, including a $2.5 billion investment in clean power, working with provinces, territories and regions, including northern and Indigenous communities, in the transition to cleaner and more reliable sources of power. • Canada committed $185 million to support a just transition for communities and workers impacted by the phase-out of traditional coal-fired electricity, including $35 million for the Canada Coal Transition Initiative, to support skills development and economic diversification, and $150 million for a dedicated infrastructure fund beginning in 2020-21 to support economic diversification in impacted communities. • On November 19, 2020, the *Canadian Net-Zero Emissions Accountability Act* was tabled in Parliament. The Act will establish a legally-binding process to set five-year national emissions reduction targets to achieve net-zero emissions in Canada by 2050. It does so by establishing a transparent process to plan, assess, and adjust the federal government's efforts to achieve, at regular intervals, national targets for the reduction of GHG emissions based on the best scientific information available, and by providing for public participation and independent advice and review with respect to those efforts. • On December 11, 2020, the Government of Canada announced *A Healthy Environment and A Healthy Economy* – a federal plan that contains 64 strengthened and new federal policies, programs and investments to enable Canada to exceed its 2030 greenhouse gas reduction target. The plan builds on the strengths and achievements that were already underway, through the Pan-Canadian Framework on Clean Growth and Climate Change, while ramping up ambition with new or strengthened federal measures. • In December 2020, Canada published final regulations to limit air pollutant emissions, including Short-Lived Climate Pollutants such as black carbon, from new stationary diesel engines, which applies to importers and manufacturers. These large engines are used in many applications throughout Canada, including for power generation in northern, remote and Indigenous communities, and at off-grid mining operations. • On February 11, 2020, Canada announced up to $6 million to support a City of Peterborough climate change initiative through the Partnerships stream of the Low Carbon Economy Fund Challenge. This funding will support the development of a Centralized Composting Facility that will divert food and waste to a new, modern facility. It is projected that it will prevent approximately 32,000 tonnes of organic debris from entering the landfill each year, support local job creation, and produce compost as a bioproduct.

Cross Cutting	
British Columbia	• British Columbia established a framework for stronger accountability of climate actions under the *Climate Change Accountability Act*. • British Columbia's Waste Reduction and Circular Economy Strategy is two-pronged: 1) supports the reduction, reuse and diversion of organic waste thereby reducing methane emissions and 2) considers overarching circular economy approaches in the development of initiatives. In September 2020, the Province launched the CleanBC Organic Infrastructure and Collection Program, co-funded by Canada through the Low Carbon Economy Leadership Fund, to build organic waste processing facilities and implement organic curbside pickup programs. • Implementation of BC's climate plan, CleanBC, continued through 2020. In December 2020, BC set a new near-term interim emission target for 2025 of 16 per cent below 2007 levels to keep BC on track to reducing carbon pollution.
Alberta	• The Alberta Emission Offset System has several protocols related to waste, including: Aerobic Composting, Aerobic Landfill Bioreactor, Biofuel Production and Usage, Biogas Production and Combustion and Landfill Gas Capture and Combustion. • Alberta released its Natural Gas Vision and Strategy following input from natural gas industry partners, Indigenous and municipal leaders, and expert advice from the 2018 Roadmap to Recovery report. Alberta's Natural Gas Vision and Strategy highlights five areas with huge growth potential in Alberta: clean hydrogen, petrochemical manufacturing, liquefied natural gas and plastics recycling. The strategy has the potential to both significantly grow the economy while reducing both domestic and international emissions. • Alberta announced in 2020 that it will provide $10 million through Emissions Reduction Alberta to build a $45-million clean energy and organic fertilizer facility in Lacombe. The facility will also cut about 40,000 tonnes of emissions each year.
Ontario	• In August 2020, Ontario began work on a multi-sector climate change impact assessment that will evaluate how climate change is expected to impact the province by region and key areas including infrastructure, food and agriculture, people and communities, natural resources, ecosystems and the environment, and business and the economy. • Ontario's cross-ministry Climate Change Leadership Team (CCLT) met throughout 2020 to collaborate and build capacity through information and knowledge-sharing on climate change as it relates to government policies, programs and operations.

Cross Cutting	
Ontario	• In October 2020, a regulatory proposal was posted on Ontario's Environmental Registry of Ontario and Regulatory Registry for the province-wide implementation of Green Button, which is a data standard that can empower households and business with access to their utility data and allow them to authorize the automatic, secure transfer of their own data from their utility to applications or third-parties.
Québec	• Québec announced its 2030 PGE, a climate change policy framework and action plan for electrifying the transportation, buildings and industrial activities in the province. • On November 1, 2020 Québec's *The Climate Change Effective Governance and Electrification Act* came into force. This law aims to effectively fight climate change and support its energy transition, while stimulating, through electrification, a green and wealth-creating economy. The province announced that the Green Fund will be replaced by the Electrification and Climate Change Fund, which will be devoted entirely to combating climate change and electrifying the economy. • In November 2020, Québec launched the 2030 PGE along with its first implementation plan for 2021–2026, with a budget of $6.7 billion over five years. The large amount of money devoted to this framework policy on electrification and the fight against climate change demonstrates the government's desire to make Québec a leader in the green economy by relying on its clean electricity.
Nova Scotia	• Nova Scotia passed the *Sustainable Development Goals Act* in 2019. The Act creates a framework to set additional goals in regulations that advance Nova Scotia's economic, social, and environmental wellbeing, sets ambitious new targets to fight climate change, and commits to a Climate Change Plan for Clean Growth. The new legislated targets include reducing greenhouse gas emissions by 53 per cent below 2005 levels by 2030 and achieving net-zero emissions in the province by 2050. In 2020, Nova Scotia continued working on the development of its new Climate Plan. • On October 30, 2020, the *Plastics Bag Reduction Act* came into effect in Nova Scotia. Businesses are no longer able to provide single use plastic bags at the checkout to encourage waste reduction at the source and to help keep plastic out of the environment and landfills.

Cross Cutting	
Prince Edward Island	• In 2020, Prince Edward Island set a net-zero GHG emissions target by 2040, building on its commitment in 2018 to reducing GHG emissions to 1.2 megatonnes (a 40 per cent reduction over 2005 levels) by 2030.
Newfoundland and Labrador	• In May 2020, Newfoundland and Labrador committed to net-zero emissions by 2050, building on its existing 2030 target to reduce GHG emissions by 30 per cent below 2005-levels. • Newfoundland and Labrador banned single use plastic bags in 2020.
Yukon	• In September 2020, Yukon released their climate change, energy and green economy strategy, *Our Clean Future*. Working in partnership with Yukon First Nations, transboundary Indigenous groups and Yukon municipalities, *Our Clean Future* outlines the top priorities for the next 10 years to address climate change, meet energy needs and build a green economy. • As part of its new climate change strategy, Yukon set targets to reduce per capita waste generation by 10 per cent by 2030, compared to 2020, and to increase per capita waste diversion to 40 per cent by 2025.

6.0 REPORTING AND OVERSIGHT

The majority of indicators draw data from Canada's National Inventory Report, which reports on Canada's greenhouse gas emissions annually, on a two-year time delay. This means that the 2020 National Inventory Report, reports Canada's greenhouse gas emissions from 2018, the first year of implementation of the Pan-Canadian Framework on Clean Growth and Climate Change.[38]

Measurement and Reporting on Emissions			
3.0 Complementary Measures to Reduce Emissions			
Indicator[39]	**Data (2017)**	**Indicator (2018)**	**Source**
Total annual greenhouse gas emissions, by economic sector	Total annual greenhouse gas emissions (CO_2e): 714 Mt By sector (CO_2e)[40]: • Oil and gas: 188 Mt • Electricity: 73 Mt • Transportation: 179 Mt • Heavy industry: 76 Mt • Buildings: 85 Mt • Agriculture: 71 Mt • Waste & Others: 42 Mt[42]	Total annual greenhouse gas emissions (CO_2e): 729 Mt By sector (CO_2e)[41]: • Oil and gas: 193 Mt • Electricity: 64 Mt • Transportation: 186 Mt • Heavy Industry: 78 Mt • Buildings: 92 Mt • Agriculture: 73 Mt • Waste & Others: 42 Mt	2020 National Inventory Report, Part 1, Table ES-3, pp 10.
Total emissions per capita	19.5 t CO_2e per capita	19.7 t CO_2e per capita	2020 National Inventory Report, Part 1, Figure ES-4, pp 6.
Emissions intensity of the economy	0.35 Mt CO_2e per billion dollars of GDP	0.35 Mt CO_2e per billion dollars of GDP	2020 National Inventory Report, Part 1, Figure ES-1, pp 4

38 The indicators presented in the 2020 Annual Synthesis Report were developed based on information included in the 2020 National Inventory Report. However, at the time of publication of this report, the 2021 National Inventory Report is publicly available.

39 Data is not available for reporting for the following indicators: emissions intensity of vehicle fleet, divided by light- and heavy-duty vehicles; adoption of energy management systems; number of non-traditional wood-based buildings and infrastructure projects; and per cent of government vehicle fleet composed of zero-emission vehicles and hybrids.

40 Sectoral emissions may not add up to total emissions due to rounding.

41 Sectoral emissions may not add up to total emissions due to rounding.

42 Adding these numbers produces a different result (115 Mt) than the total number of emissions for Forestry, Agriculture, and Waste (92 Mt) reported in the following pages. Here, 'Waste and others' includes emissions from coal production, light manufacturing and construction, which are excluded from 'Forestry, Agriculture and Waste' reported in section 3.5 of this table.

Measurement and Reporting on Emissions

3.1 Electricity

Indicator	Data (2017)	Indicator (2018)	Source
Electricity sector greenhouse gas emissions by fuel type	Coal: 57 200 kt CO_2e Natural Gas: 16 300 kt CO_2e Other fuels: 4 820 kt CO_2e	Coal: 44 100 kt CO_2e Natural Gas: 21 000 kt CO_2e Other fuels: 4 690 kt CO_2e	2020 National Inventory Report, Part 3, Table A13-1, pp 60
Emissions intensity of electricity supply	Generation intensity: 130g CO_2e/kWh Consumption intensity: 140g CO_2e/kWh	Generation intensity: 120g CO_2e/kWh Consumption intensity: 130g CO_2e/kWh	2020 National Inventory Report, Part 3, Table A13-1, pp 60
Electricity generation by fuel type	• Coal: 55 900 GWh • Natural Gas: 35 100 GWh • Other fuels: 8 290 GWh • Nuclear: 95 600 GWh • Hydro: 361 000 GWh • Other renewables: 32 100 GWh • Other generation: 200 GWh	• Coal: 47 000 GWh • Natural Gas: 43 300 GWh • Other fuels: 8 440 GWh • Nuclear: 95 000 GWh • Hydro: 353 000 GWh • Other renewables: 34 000 GWh • Other generation: 210 GWh	2020 National Inventory Report, Part 3, Table A13-1, pp 60
3.2 Built Environment			
Absolute emissions from the built environment	85 Mt CO_2e	92 Mt CO_2e	2020 National Inventory Report, Part 1, Table 2-12, pp 56
3.3 Transportation			
Absolute emissions from the transportation sector	179 Mt CO_2e	186 Mt CO_2e	2020 National Inventory Report, Part 1, Table 2-12, pp 56

Measurement and Reporting on Emissions

3.3 Transportation

Indicator	Data (2017)	Indicator (2018)	Source
Total emissions from road vehicles, divided by light and heavy duty vehicles	• Total emissions from road vehicles: 148 000 kt CO_2e • Emissions from light-duty vehicles: 84 821 kt CO_2e • Emissions from heavy-duty vehicles: 62 600 kt CO_2e	• Total emissions from road vehicles: 154 000 kt CO_2e • Emissions from light-duty vehicles: 87 891 kt CO_2e • Emissions from heavy-duty vehicles: 65 400 kt CO_2e	2020 National Inventory Report, Part 1, Table 3-7, pp 67
Greenhouse gas emissions from off-road transportation	5 120 kt CO_2e	5 350 kt CO_2e	2020 National Inventory Report, Part 1, Table 3-7, pp 67
Number of electric charging and alternative fuelling stations	2 049 electric charging and alternative fuelling stations (funded by government programs).	2 164 electric charging and alternative fuelling stations (funded by government programs).	Electric Charging and Alternative Fuelling Stations Locator, Natural Resources Canada. 2018-09-04. Web Map. (Link)
Domestic aviation emissions	7 340 kt CO_2e	7 900 kt CO_2e	2020 National Inventory Report, Part 1, Table 3-7, pp 67
Domestic railway emissions	7 490 kt CO_2e	7 650 kt CO_2e	2020 National Inventory Report, Part 1, Table 3-7, pp 67
Domestic maritime emissions	3 720 kt CO_2e	3 780 kt CO_2e	2020 National Inventory Report, Part 1, Table 3-7, pp 67

Measurement and Reporting on Emissions			
3.3 Transportation			
Indicator	**Data (2017)**	**Indicator (2018)**	**Source**
Zero-emission Vehicles as Proportion of Total New Vehicles Registered[43]	1.00 per cent	2.21 per cent	Zero-emission vehicles (ZEVs) as a proportion of total new vehicles registered in Canada. StatsCan. February 11, 2021. (Link)
3.4 Industry			
Absolute emissions from heavy industry	76 Mt CO_2e	79 Mt CO_2e	2020 National Inventory Report, Part 1, Table 2-12, pp 56
Greenhouse gas emissions from heavy industry, by sub-sector	• Mining: 7 Mt CO_2e • Smelting and refining (non-ferrous metals): 11 Mt CO_2e • Pulp and paper: 7 Mt CO_2e • Iron and steel: 15 Mt CO_2e • Cement: 11 Mt CO_2e • Lyme and gypsum: 3 Mt CO_2e • Chemicals and fertilizers: 22 Mt CO_2e	• Mining: 8 Mt CO_2e • Smelting and refining (non-ferrous metals): 10 Mt CO_2e • Pulp and paper: 8 Mt CO_2e • Iron and steel: 16 Mt CO_2e • Cement: 11 Mt CO_2e • Lyme and gypsum: 2 Mt CO_2e • Chemicals and fertilizers: 24 Mt CO_2e	2020 National Inventory Report, Part 3, Table A10-2, pp 11
Total methane emissions	3 700 kt CH_4 (92 000 kt CO_2e)	3 700 kt CH_4 (91 000 kt CO_2e)[44]	2020 National Inventory Report, Part 3, Table A9-3, pp 7

43 Sectoral emissions may not add up to total emissions due to rounding.

44 2017 and 2018 have differences in exact methane emissions data not captured by the rounding of data for reporting in the National Inventory Report. The difference in exact data changes results in kt CO_2 equivalents.

Measurement and Reporting on Emissions

3.5 Forestry, Agriculture and Waste

Indicator	Data (2017)	Indicator (2018)	Source
Absolute emissions from forestry, agriculture and waste	90 Mt CO_2e	92 Mt CO_2e	2020 National Inventory Report, Part 3, Table A10-2, pp 11
Forest area artificially regenerated	376 916 hectares planted. 17 292 hectares seeded.	356 371 hectares planted. 6 003 hectares seeded.	Area artificially regenerated and number of seedlings planted. National Forestry Database, Canadian Council of Forest Ministers. 2021 02 23. (Link)
Emissions sequestered through forestry and land use activities	-16 000 kt CO_2e	-13 000 kt CO_2e	2020 National Inventory Report, Part 1, Table 6-1, pp 142
Greenhouse gas emissions from agriculture	71 Mt CO_2e	73 Mt CO_2e	2020 National Inventory Report, Part 1, Table 2-12, pp 56

Measurement and Reporting on Emissions

3.5 Forestry, Agriculture and Waste

Indicator	Data (2017)	Indicator (2018)	Source
Greenhouse gas emissions from waste, by source	• Biological treatment of solid waste: 0.45 Mt CO_2e • Incineration and open burning of waste: .39 Mt CO_2e • Industrial Wood Waste Landfills: 3.5 Mt CO_2e • Solid waste disposal: 12.5 Mt CO_2e • Wastewater treatment and discharge: 1.1 Mt CO_2e	• Biological treatment of solid waste: 0.45 Mt CO_2e • Incineration and open burning of waste: .39 Mt CO_2e • Industrial Wood Waste Landfills: 3.4 Mt CO_2e • Solid waste disposal: 12.3 Mt CO_2e • Wastewater treatment and discharge: 1.1 Mt CO_2e	2020 National Inventory Report, Part 1, Table 2-11, pp 51
Landfill gas flaring for beneficial use	463.56 kt CH_4 flared and utilized (of which 197.92 kt is flared, and 265.64 kt is utilized)	473.68 kt CH_4 flared and utilized (of which 201.67 kt is flared, and 272.01 kt is utilized)	2020 National Inventory Report, Part 2, Table A3.6-6, pp 174
3.6 Government Leadership			
Greenhouse gas emissions from government operations	960.1 kt CO_2e (FY 2017-18)	1.1 Mt CO_2e (FY 2018-19)[45]	Item 2 – Energy Use and Greenhouse Gas Emissions Related to Federal Facilities. Government of Canada's Greenhouse Gas Emissions Inventory. Treasury Board of Canada Secretariat. (Link)

45 Data for greenhouse gas emissions from government operations in 2018 includes emissions reported by Government of Canada departments that did not report their emissions in 2017. As such, the change in emissions from 2017 to 2018 is not a direct comparison and partially reflects an increase in emissions reporting.